# VALIDATION REPORT

## AVELINO BRAGAGNOLO - WASTEWATER TREATMENT USING AEROBIC SYSTEM

**Report No: 08/5927 – 346/08**

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|---|---|
| Date of first issue :<br>2009-01-07 | Project No.:<br>08/5927 – 346/08 |
| Approved by:<br>Mr. Rainer Winter | Organisational unit:<br>TÜV NORD JI/CDM Certification Program |
| Client:<br>AMBIO Participações Ltda<br>Avelino Bragagnolo S.A. Indústria e | Client ref.:<br>Mr. Nuno Cunha e Silva<br>Mr. Avelino Bragagnolo |

Summary/Opinion:
Ambio participações Ltda and Avelino Bragagnolo S.A. Indústria e Comércio have commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: "Avelino Bragagnolo – Wastewater Treatment using Aerobic System" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords), the simplified modalities and procedures for small scale CDM project activities of annex II to decision 21/CP.8 and the relevant decisions by COP/MOP and CDM Executive Board.

The project activity avoids the production of methane from biogenic organic matter being treated in anaerobic lagoons, through the substitution of the present anaerobic lagoons by an aerobic treatment system.

A risk based approach has been followed to perform this validation. In the course of the pre-validation, 4 Corrective Action Requests (CARs) and 14 Clarification Requests (CRs) were raised and successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (Brazil) and all relevant UNFCCC requirements for CDM. Project activity approval has not yet been obtained from the DNA of Brazil since a positive validation opinion is a pre-requisite for issuance of Letter of Approval (LOA).
- The project is in line with all relevant UNFCCC requirements for CDM.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 167,360 $tCO_2e$ are most likely to be achieved within the fixed crediting period (1st Jun 2009 - 31st May 2019).

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

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|---|---|
| Report No.:<br>08/5927 – 346/08 | Subject Group:<br>Environment |
| Report title:<br>*Avelino Bragagnolo – Wastewater Treatment using Aerobic System* | |
| Work carried out by:<br>Mr. Rainer Winter<br>Ms. Maria Carolina C. Coelho<br>Mr. Ricardo Lopes<br>Ms. Annika Blarr | |
| Work verified by:<br>Mr. Eric Krupp | |

| | | |
|---|---|---|
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**Indexing terms**

Climate change
CDM
Validation
Kyoto Protocol

## Abbreviations

| | |
|---|---|
| **BAU** | Business as usual |
| **CA** | Corrective Action / Clarification Action |
| **CAR** | Corrective Action Request |
| **CDM** | Clean Development Mechanism |
| **CER** | Certified Emission Reduction |
| **CIMGC** | Brazilian DNA - *Comissão Interministerial para Mudança Global do Clima* - Interministerial Comission on Global Climate Change |
| **$CO_2$** | Carbon dioxide |
| **$CO_2e$** | Carbon dioxide equivalent |
| **CP** | Certification Program |
| **CR** | Clarification Request |
| **DNA** | Designated National Authority |
| **EB** | CDM Executive Board |
| **GHG** | Greenhouse gas(es) |
| **HGA** | Host Government Approval |
| **LoA** | Letter of Approval |
| **MP** | Monitoring Plan |
| **M&P** | Modalities and Procedures |
| **ODA** | Official Development Assistance |
| **PDD** | Project Design Document |
| **PP** | Project Proponent |
| **QC/QA** | Quality control/Quality assurance |
| **SSC** | Small-Scale |
| **UNFCCC** | United Nations Framework Convention on Climate Change |
| **VVM** | Validation Verification Manual |

**Table of Contents** **Page**

# 1 INTRODUCTION

***AMBIO Participações LTDA e Avelino Bragagnolo S.A. – Indústria e Comércio*** have commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project:

"*Avelino Bragagnolo – Wastewater Treatment using Aerobic System*"

with regard to the relevant requirements for CDM project activities.

## 1.1 Objective

The purpose of this validation is to have an independent third party assess the project design. In particular the project's baseline, the monitoring plan (MP), and the project's compliance with

- the requirements of Article 12 of the Kyoto Protocol; the CDM modalities and procedures as agreed in the Marrakech Accords/MA/ under decision 17/CP.7; the annex to the decision; subsequent decisions made by COP/MOP & CDM Executive Board,
- other relevant rules, including the host country (Brazil) legislation and sustainability criteria

are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

## 1.2 Scope

The validation scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan (based on AMS III.I, Avoidance of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems, Version 6, valid from 10 August 2007 to 09.October 2008, requests for registration can be submitted until 09. June 09), which are included in the PDD and other relevant supporting documents.
The items covered in the validation are described below:

- **UNFCCC & Host Country Criteria**
  - UNFCCC/Kyoto Protocol requirements, in particular, the requirements of the CDM as set out in decision 17/CP.7 (Marrakech Accords), the present annex, and relevant decisions by COP/MOP & CDM Executive Board
  - Host country requirements / criteria

- **CDM Project Description**
  - Project design
  - Project boundaries

- Predicted CDM project GHG emissions

- **Project Baseline**
  - Baseline methodology
  - Baseline GHG emissions

- **Additionality**

- **Monitoring Plan**
  - Monitoring methodology
  - Indicators/data to be monitored and reported
  - Responsibilities

- **Background investigation and follow up interviews**

- **Stakeholder consultation**
  - Publishing the PDD/PDD/ on UNFCCC website
  - Review of comments

- **Draft validation reporting with CARs & CRs, if any**

- **Final validation reporting.**

The information included in the PDD and the supporting documents were reviewed against the requirements and criteria mentioned above. The TÜV NORD JI/CDM CP has, based on the recommendations in the Validation and Verification Manual/VVM/, employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs. The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions. TÜV NORD JI/CDM CP can not be held liable by any entities for making its validation opinion based on any false or misleading information supplied to it during the course of validation.

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

## 1.3 GHG Project Description

### 1.3.1 Project Scope

The considered GHG project can be classified as a small scale CDM project in the sector given in Table 1-1 (according to List of Sectoral Scopes of UNFCCC).

**Table 1-1:** Project Scope(s)

| No. | Project Scope |
|---|---|
| 13 | Waste handling and disposal |

### 1.3.2 Project Parties

Brazil is the party involved in the project activity.

### 1.3.3 Project Entities

The following entities are involved in the developing of the project:

| | |
|---|---|
| **Project Participant 1 (the project owner)** | Avelino Bragagnolo S/A Indústria e Comércio<br>FAG roadway 050, km. 13 – Barra Grande district<br>Faxinal dos Guedes<br>89.696-000 Santa Catarina State<br>Brazil |
| **Contact person:** | Mr. Avelino Bragagnolo<br>President director<br>Tel No: +55 49 3441 7300<br>URL: http://www.bragagnolo.com.br |
| **Project Participant 2 (consultants)** | AMBIO Participações Ltda.<br>R. Marquês de S. Vicente, 225<br>Gênesis, 13-A<br>22.453-900 Rio de Janeiro – RJ.<br>Brazil |
| **Contact Person:** | Mr. Marcelo Duque Silva<br>Partner<br>Tel No: +55 21 3114-4444<br>Email: ambio@ambiosa.com.br<br>URL: www.ambiosa.com.br |

### 1.3.4 Project location

The Project is located on km 13 of roadway 50 in the Municipality of Faxinal dos Guedes in Santa Catarina State. The Geographical coordinates of the project is as below:

**Table 1-2:** Project Location

| | |
|---|---|
| Host Country | Brazil |
| Region | Santa Catarina State |
| Project location address | Faxinal dos Guedes Municipality<br>FAG roadway 050, km 13 – Barra Grande district<br>89.696-000 - SC - Brazil |
| **Coordinates** | |

| | |
|---|---|
| Latitude | 26º46'16"S |
| Longitude | 52º11'23"W |

### 1.3.5 Project technical description

The proposed project activity is the avoidance of production of methane from biogenic organic matter being treated in anaerobic lagoons, through the substitution of the present anaerobic lagoons by an aerobic treatment system.

The estimated amount of emission reductions over the chosen 10-year "fixed crediting period" is **167,360t $CO_{2e}$** (according to the PDD[/PDD/]) from 2009 to 2019.

Main constructions of the project include:

Primary treatment: Accumulation tank (existing), Hidrapulper, Floater, Sand-Remover, Primary Decanter, Sludge Concentrator, Sludge Press House;
Biological treatment: Equalization tank (250$m^3$/h), Airing tank, Secondary Decanter, Flow Meter

The key technical parameters for the proposed project activity are given in the following table.

**Table 1-3:** Key technical indicators of the aerobic system

| **Primary Treatment :** | |
|---|---|
| **Parameters** | |
| Flow | 250 $m^3$/h |
| Solid Sediment after flotation | Max 80 ml/l |
| **Structures** | |
| Sand Remover | 25 $m^2$ |
| Primary Decanter | 400$m^2$ (internal diameter 22m) |
| Sludge Concentrator | 150$m^2$ (internal diameter 11m) |
| Sludge Press House | 40 $m^2$ |
| **Equipment** | |
| 01 Press-Filter | capacity of 8$m^3$/day with pneumatic feeding pump and sludge preparation tank |
| 03 Pumps | open rotator for pumping of effluent to floaters, with a flow of 125 $m^3$/h each. One of them is back-up |
| 02 Surface Scratchers TECNOSAN | For the Floater, type Kroft, with 7,20m of diameter and accessories (02 air pressurizers, 02 recirculation pumps, 02 dosing pumps and 01 polimer preparation tank |
| 01 Sludge Scratching Bridge TECNOSAN | Central Traction, with sand conveyer to the square Sand-Remover (4,5 $m^2$) |
| 01 Sludge Scratching Bridge TECNOSAN | Periferic Traction for the Primary Decanter with 18-meter diameter |
| 02 Pumps (One is back-up) | For removal of sludge from Primary Decanter to the Sludge Concentrator with 60 $m^3$/h each. |
| 01 Sludge Concentrator Bridge TECNOSAN | Central Traction for the Sludge Concentrator with 12-meter diameter |
| 01 Sludge Dewatering Press | 2 meter wide screen for a max of 20 $m^3$/h of sludge, with feeding pump, dosing pump, frequency inversors, tank for dissolution of chemical product and pump for screen washing. Structure and cilinders in carbon-steel |
| 01 Electric Panel | For Primary Treatment |

| **Secundary Treatment** | |
|---|---|
| **Parameters** | |
| Flow | 250 $m^3$/h |
| BOD (Biologic oxygen demand) | 800 mg/l |
| COD (Chemical oxygen demand) | 1.200 mg/l |
| **Structures** | |
| Equalization Tank | Volume 1.800 $m^3$ |
| Airring Tank | Volume 6.000 $m^3$ |
| Secundary Decanter | Surface area 600 $m^2$ (internal diameter 23m) |
| | |
| **Equipment** | |
| 01 Bottom Airing System TECNOSAN | Composed of 120 air difusers and 2 blowers roots type(one is back-up). They supply air for equalization tank |
| 02 Pumps (One is back up) | For pumping of effluent from equalization tank for the airing tank, with 250 $m^3$/h each. |
| 01 Bottom Airing System TECNOSAN | Composed of 768 air difusers and 4 blowers roots type (one is back-up) and 01 disolved oxygen meter. They supply oxygen for Aring Tank |
| 01 Set of Mechanic Gates | For operation of the Airing Tank |
| 01 Sludge Scratching Bridge TECNOSAN | Periferic Traction for the Secundary Decanter (diameter 23 m) |
| 02 Pumps (One is back up) | For recirculation of sludge from Secundary Decanter to the Airing Tank, with 250 $m^3$/h each. |
| 02 Pumps (One is back up) | For discharge of sludge from Secundary Decanter to the Sludge Concentrator, with 30 $m^3$/h each. |
| 01 Parshall Meter TECNOSAN | 6“ in fiberglass for final metering of effluents |
| 01 Electric Panel | For the Station |

# 2 VALIDATION TEAM

The Validation Team is led by

- **Rainer Winter,** TÜV NORD CERT GmbH. Mr. Winter works at TÜV NORD as ISO 9001/ 14001 auditor and environmental verifier for EMAS. He is also an approved emission verifier within the European Emission Trading Scheme. He is an authorized JI/CDM assessor and is global leader of the TÜV NORD JI/CDM CP.

For this validation he was assisted by:

- **Maria Carolina C. Coelho**, BRTÜV (TÜV NORD Brazil), Mrs. Coelho is ISO 14001 lead auditor and Product Manager for CDM Services for BRTÜV. She is an appointed expert for the TÜV NORD JI/CDM certification program.
- **Ricardo Lopes**, BRTÜV (TÜV NORD Brazil) – São Paulo, Brazil. Mr. Lopes is an ISO 9001 auditor and 14001 internal auditor and GHG auditor. He has received extensive CDM training and has participated in several projects in the voluntary carbon market and CDM.
- **Annika Blarr.** TÜV NORD CERT GmbH. – Trainee - Mrs. Blarr is an environmental scientist and works for TÜV NORD JI/CDM certification program. She is also auditor for green energy and biogas products and is appointed ISO 14001 auditor.

The validation report is verified by:

- **Eric Krupp**. He is an expert in the field of environmental approval procedures as well as national and international Emission Trading. He worked in different projects in the framework of the German allocation procedure, the verification of the annual $CO_2$ emission reports and the validation/verification of several JI and CDM projects as part of the validation/verification teams of TÜV NORD CERT GmbH respectively TÜV NORD JI/CDM CP. Mr. Krupp is an appointed JI/CDM senior assessor and the deputy of TÜV NORD JI/CDM certification program

# 3 METHODOLOGY

The validation of the project was carried out from October 2008 to January de 2009. The validation consisted of the following three phases:

- A desk review of the PDD (incl. annexes) and supporting documents with the use of a customised validation protocol according to the Validation and Verification Manual;
- Back ground investigation and follow-up interviews with personnel of the project proponent, the consultant, legal authorities and other stakeholders;
- Reporting of validation findings taking into account the public comments received on UNFCCC website.

The report includes Corrective action and Clarification Requests (CAR and CR) identified in the course of this validation.

A **Corrective Action Request** is established if

- mistakes have been made in assumptions or the project documentation which directly will influence the project results;
- the requirements deemed relevant for validation of the project with certain characteristics have not been met; or
- there is a risk that the project would not be registered by the UNFCCC or that emission reductions cannot be verified and certified.

A **Clarification Request** is issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

The final validation started after issuance of proposed corrective action (CA) of these CAR and CR by the project proponent. The validator has assessed the proposed CA with a positive result and after the closure of these CAR and CR the project proponent has issued the final version of the PDD/PDD/. On the basis of this final version, the validation report and opinion is issued.

## 3.1 Validation Protocol

In order to ensure consideration of all relevant assessment criteria, a validation protocol was used. The protocol shows, in a transparent manner, criteria and requirements, means of verification and the results from pre-validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables: Table 1 (Mandatory Requirements); Table 2 (Requirement Checklist); and Table 3 (Resolution of Corrective Action and Clarification Request) as described in Figure 1.

The completed validation protocol is enclosed in the annex to this report, identifying 04 Corrective Action Requests and 14 Clarification Requests.

| ***Validation Protocol Table 1: Mandatory Requirements*** | | | |
|---|---|---|---|
| ***Requirement*** | ***Reference*** | ***Conclusion*** | ***Cross reference*** |
| *The requirements the project must meet.* | *Gives reference to the legislation or agreement where the requirement is found.* | *This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.* | *Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.* |

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

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

**Figure 1:** Validation protocol tables

## 3.2 Review of Documents

The draft PDD submitted by AMBIO Participações Ltda. in October 2008, and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the validation team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The documents that were considered during the validation process are given in chapter 7 of this report. They are listed as follows:

- Documents provided by the project proponent (Table 7-1)
- Background investigation and assessment documents (Table 7-2)
- Websites used (Table 7-3).

In order to ensure the transparency of the decision making process, the reference codes listed in tables 7-1 to 7-3 are used in the validation protocol and – as far applicable – in the report itself.

## 3.3 Follow-up Interviews

On 10th October 2008, the TÜV NORD JI/CDM CP performed interviews with the project owner, project developer, plant operating personnel and stakeholder to confirm selected information and to resolve issues identified in the document review.

The key interviewee and main topics of the interviews are summarised in Table 3-1.

**Table 3-1** Interviewed persons and interview topics

| Interviewed Persons / Entities | Interview topics |
|---|---|
| Project owner representatives, plant operating personnel /IM01/ | - Chronological description of the project activity<br>- Technical details of the project realisation and Project Design Report<br>- Host Government Approval (Brazil)<br>- Approval procedures and status<br>- Quality management system<br>- Monitoring and measurement equipment<br>- Crediting period and its starting date<br>- Project activity starting date<br>- Emission reducitons purchase agreement<br>- Sustainable development benefits because of project<br>- Analysis of local stakeholder consultation |

| Interviewed Persons / Entities | Interview topics |
|---|---|
| | - Operational data – technical specification, start up, volume of effluent to be treated,etc.<br>- Training & competency of the staff members w.r.t project management, monitoring and reporting |
| Project consultant representatives /IM02/ | - Editorial aspects of PDD<br>- Methodology selection aspects<br>- Baseline study, leakage and additionality<br>- Details of emission reduction calculation<br>- Debundling<br>- Job opportunities<br>- Stakeholder process<br>- Concerns related to the project |

## 3.4 Resolution of Clarification and Corrective Action Requests

In order to remedy any mistakes, problems or any other outstanding issues, which needed to be clarified for positive conclusion on the project design, CARs and CRs were raised. These requests can be resolved or "closed out" by the project proponent by providing the corresponding response in column 3 of table three as meant in Figure 1 and submission of revised PDD/PDD/ and supporting documents.

In this validation report 4 CARs and 14 CRs are raised.

The CARs / CRs are documented in the Annex and addressed in section 4.

## 3.5 Public Stakeholder Comments

The PDD/PDD/ was made publicly available through TÜV NORD JI/CDM CP website www.global-warming.de and also on the UNFCCC website www.unfccc.int. Comments on the PDD/PDD1/ were invited within 30 days, i.e. 10/10/2008 to 08/11/2008.

No comments were received. In case comments would have been received, they would have also been made publicly available on this web site.

## 3.6 Finalising the report

The draft validation report was submitted to the project proponents. After reviewing the revised and resubmitted project documentation; resolving the CRs & CARs raised and outstanding concerns TÜV NORD JI/CDM CP issues the final validation report and opinion.

# 4 VALIDATION FINDINGS

In the following protocol the findings from the desk review of the draft PDD, visits, interviews and supporting documents are summarised.

The results are shown in table 4-1:

**Table 4-1:** Summary of CAR and CR issued

| Validation topic [1)] | No. of CAR | No. of CR |
|---|---|---|
| General description of project activity (A)<br>- Project boundaries<br>- Participation requirements<br>- Technology to be employed<br>- Contribution to sustainable development | - | 3 |
| Project baseline and Monitoring methodology (B)<br>- Baseline Methodology<br>- Baseline scenario determination<br>- Additionality determination<br>- Calculation of GHG emission reductions<br>Project emissions<br>Baseline emissions<br>Leakage<br>- Emission reductions<br>- Monitoring Methodology<br>- Monitoring of<br>Project emissions<br>Baseline emissions<br>Leakage<br>Sustainable development indicators / environmental impacts<br>- Project management planning | 3 | 9 |
| Duration of the Project / Crediting Period (C) | - | 2 |
| Environmental impacts (D) | 1 | - |
| Stakeholder Comments (E) | - | - |
| **SUM** | **4** | **14** |

[1)] The letters in brackets refer to the validation protocol

An in depth evaluation of all validation items is present in the validation protocol (Annex). Annex also includes all CARs and CRs (Tables 2 and 3).

## 4.1 Participation Requirements

Brazil, the host country, has ratified the Kyoto Protocol on 23rd August 2002, and as a non Annex I party meets all relevant participation requirements.

The Brazilian DNA assigned for CDM is the CIMGC (Global Climate Change Interministerial Commission). At the time of validation, the Letter of Approval has not yet been issued by the CIMGC. A positive validation opinion is a pre-requisite for host government approval thus the LoA could not be considered at the present validation stage.

Corresponding changes of the project documentation due to the approval process will be addressed in a revision of the final validation report.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Tables 2 and 3).

## 4.2 Project design

The objective of the Project is to reduce GHG emissions by substitution of anaerobic lagoons by an aerobic system of wastewater treatment. The project activity is estimated to reduce GHG emissions equivalent to16,736 $tCO_2e$ annually.

The project design does reflect current good practices. The technology used in the project activity is environmentally safe and sound. No technology transfer is involved in the project activity.

Based on the financial information furnished by the project participant, no ODA contributes to financing of the project./IM01/

In terms of sustainable development, social, economic and environmental benefits are achieved. The project uses clean and efficient technologies and local social economic development is stimulated by the project through creating job opportunities during construction and capacity building by means of training of employees to operate a more sophisticated system. Since most of the materials and equipments which were purchased were produced in the host country, it also contributed to economic growth and increased taxes revenues for the host country and also to the development of the market for equipments and services related to more complex wastewater treatment systems. Besides GHG mitigation, the quality of the water that exits the system and reaches Chapecozinho River will be improved.

However, CR A1, CR A2, CR B9 and CR A3 were raised.

For an in depth evaluation of all validation items please refer to the validation protocol (Annex). Annex also includes all CARs and CRs (Tables 2 and 3).

## 4.3 Baseline and Additionality

According to approved methodology AMS III.I. – Avoidance of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems (Version 6), the baseline scenario is the situation where, in the absence of the project activity, degradable organic matter in wastewater is treated in anaerobic lagoons and methane is emitted to the atmosphere. Baseline emissions are calculated as the amount of methane produced in the anaerobic system that was replaced with aerobic system.

The $ER_y$ of the project activity during the crediting period is the difference between the baseline emission ($BE_y$) and the sum of project emission ($PE_y$) and leakage ($L_y$).

The baseline emissions from the lagoon are estimated using the procedure defined under category AMS III.H.

***Baseline emission***: As prescribed in the methodology AMS III.H., $BE_y$ is calculated by multiplying the volume of effluent treated during the months of average temperature above 15°C, times the chemical oxygen demand of the effluents entering the lagoons, times the methane correction factor for the waste water treatment in anaerobic lagoons, times the global warming potential of methane.

However, CR B1, CR B2. CR B7 and CR B8 were raised.

For an in depth evaluation of all validation items please refer to the validation protocol (Annex). The Annex also includes all CARs and CRs (Tables 2 and 3).

### Additionality

The additionality was demonstrated according to § 28 of the simplified modalities and procedures for small-scale CDM project activities in connection with attachment A to appendix B as a financial and barrier analysis.[/SMP/]

The individual arguments presented in the PDD[/PDD/] to justify the additionality were summarised in table 4-2. This table also includes the assessment of the validation team.

**Table 4-2:** Additionality assessment

| Type of barrier[1)] | Argument | Assessment |
|---|---|---|
| **(a)** | The project offers no other incomes than the revenues from the sales of CERs.<br>A high amount of investment is necessary to implement the project. The contract with TECNOSAN alone, which does not include the costs with the civil works, amounts to R$860.000,00.<br>In addition, with the project, the PP will | ☐ Argument not justified<br>☐ Argument not convincing<br>☐ Argument justified but not a decisive barrier<br>☒ Argument justified / significant barrier<br><br>See assessment underneath this table. |

| Type of barrier[1)] | Argument | Assessment |
|---|---|---|
| | incur in higher operation & maintenance costs, such as electricity necessary for the new equipments and higher maintenance costs due to the complexity and number of equipments of the new treatment system. | |
| **(d)** | The construction of the new wastewater system involves several changes: decanters must be installed, lagoons must be changed and destroyed in order to be transformed from anaerobic to aerobic. This kind of work is not part of the company's core business and construction of this sort would causes disturbance in day-to-day activities of the factory. Moreover the company needs to train employees to work with the new equipment and system. | ☐ Argument not justified<br>☐ Argument not convincing<br>☒ Argument justified but not a decisive barrier<br>☐ Argument justified / significant barrier<br><br>See assessment underneath this table. |
| **Assessment of the validation team** | | ☒ Project is additional<br>☐ Project is not additional |

1) Classification acc. to Attachment A to Appendix B of the simplified modalities and procedures: a) investment barrier; b) technological barrier; c) barrier due to prevailing practice; d) other barriers

***Investment barrier***

There are no other incomes derived from the project activity apart from revenues from CERs. The time period between the finalization of the PDD and the investment decision is sufficiently short so that is not likely that input values have been materially changed. The sources of data are assessed to be adequate and the assumptions stated in the reports are assessed to be reasonable.

Without the revenues from CERs it is fair to assume that the project would not be implemented.

However, CR B3 and CR B4 were raised.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Tables 2 and 3).

**Evidence of Management Decision**

It is stated in the PDD, that the milestone date for the project activity is the elaboration of the engineering project of the new system on 07/02/2008. A Purchase Confirmation Order of the same date, signed between the PP and TECNOSAN, the engineering firm which is responsible for the design and supply of all equipment and training of staff to operate of the new system was provided as evidence.

The PP states that they started to study the possibility of changing the wastewater treatment system after another paper company in the region, Celulose Irani S.A., registered a similar project under the CDM (ref 1410).

It is also stated that an expert started to develop the PDD even before the technical project was finished by TECNOSAN. This company was also responsible for Irani's project.

An ERPA providing for the purchase of the CERs from the project, dated of 07/01/2008 was made available to validation team and supports that evidence.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Tables 2 and 3).

## 4.4 Crediting Period

The starting date of the crediting period as mentioned in the PDD/PDD/ under Section C.2. is 01/06/2009 but not earlier than registration. The intended crediting period of the project is for a fixed period of ten years i.e. starting from the date of registration in 2009 up to 2019. The starting date of the project activity as mentioned in the PDD/PDD/ under Section C.1 is 07/02/2008 The project expected operational life time indicated in the Section C.1.2 of the PDD/PDD/ is 30 years.

However, CR C1 and CR C2 were raised.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Tables 2 and 3).

## 4.5 Monitoring Plan

According to item 8 of methodology AMS III.I, the emission reductions are the difference between baseline emissions and the sum of project emission and leakage.

ERy=BEy-(PEy+Leakage)

Since all equipments purchased are new and were not transferred from another project activity, according to the methodology, leakage is considered zero.

Therefore the monitoring plan provides for the monitoring of all parameters to calculate baseline emissions and project emissions, according to the equations given in methodology AMS III.I.

All monitored data and parameters are described in section B.7.1 of the PDD/PDD/.

The procedures for calibration, accuracy and maintenance of monitoring equipment and the responsibilities are mentioned in section B.7. of the PDD/PDD/.

However, CR B3 was raised.

For an in depth evaluation of all validation items it please refer to the validation protocol (Annex). The Annex also includes all CARs and CRs (Tables 2 and 3).

## 4.6 Calculation of GHG Emissions

The methodologies for calculating emission reductions are documented. The project intends to reduce methane emissions (CH4) by substitution of anaerobic lagoons by an aerobic treatment system.

***Project emissions:*** The project emission is the sum of emissions due to: electricity consumption of the new system equipments; emissions from the aerobic system; and emissions from anaerobic decay of the sludge produced (if not incinerated or utilized).

The Brazilian DNA is responsible for the calculations of parameters $EF_{OM}$ and $EF_{BM}$ according to the and the information is publicly available in its website. These factors are utilized for the definition of $EF_{grid,CM}$, which in this present project is necessary to calculate project emissions due to the consumption of electricity of equipments and will be a parameter monitored ex-post.

In order to have access to the data used for the $EF_{BM}$ and $EF_{OM}$ calculation, the DOE/AIE Forum requested the Brazilian DNA for an opportunity to assess that the "tool to calculate the emission factor for an electricity system" was correctly applied in calculating the grid emission factor at their offices, observing its specific requirements, including confidentiality and non-removal of data from its offices[/DFL/]. Trough a meeting realized on 2009/02/05, in Brasília, the Brazilian DNA granted to one representative of the DOE/AEI Forum and one representative of each DOE the opportunity to assess the correct application of the tool[/DNAOF/]. One representative of TÜV NORD CERT GmbH JI/CDM Certification Program attended this meeting. Sufficient evidence could be provided that the "tool to calculate the emission factor for an electricity system" is correctly applied by the Brazilian DNA for the $EF_{BM}$ and $EF_{OM}$ identification.

The validation team is convinced that the identified $EF_{gridCM}$ is properly calculated. The emission coefficient calculation is deemed to be adequate and transparent. All data required for emission coefficient calculation are derived from publicly available data of DNA website.[/dna/]

***Leakage:*** The technology introduced is not transferred to or from another project activity. Thus leakage can be ignored.

The emission reduction calculation was reviewed by the validation team. All underlying data/ values are transparent presented and assessed to be adequate.

However, CR B5, CR B6, CAR B1 and CAR B2 were raised.

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs and CRs (Tables 2 and 3).

## 4.7 Environmental Impacts

No significant adverse social or environmental impacts as well as transboundary impacts have been envisaged for this project activity.

An EIA is not required by national or state law for this kind of project activity.

However, CAR D1 was raised.

For an in depth evaluation of all validation items, please refer to the validation protocol (Annex). Annex also includes all CARs and CRs (Tables 2 and 3).

## 4.8 Comments by Local Stakeholders

Avelino Bragagnolo informed various stakeholders such as local government officials, the chamber of deputies of Faxinal dos Guedes, local and national NGOs, etc, about the project details through letters sent with proof of receipt[/AR/], according to Brazilian DNA's rules.

Supporting evidences were submitted to the D.O.E.

For an in depth evaluation of all validation please refer to the validation protocol (Annex). The Annex also includes all CARs and CRs (Tables 2 and 3).

# 5 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

According to the modalities for the validation of CDM projects, the draft PDD/PDD/ was approved to be hosted on the UNFCCC's website 10/10/2008 and invited comments within 30 days, until 08/11/2008 by parties, stakeholders and UNFCCC accredited non-governmental organisations..

No comments were received. In case comments would have been received they would have also been made publicly available on the web site.

# 6 VALIDATION OPINION

Ambio participações Ltda and Avelino Bragagnolo S.A. Indústria e Comércio have commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: "Avelino Bragagnolo – Wastewater Treatment using Aerobic System" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords), the simplified modalities and procedures for small scale CDM project activities of annex II to decision 21/CP.8 and the relevant decisions by COP/MOP and CDM Executive Board.

The project activity avoids the production of methane from biogenic organic matter being treated in anaerobic lagoons, through the substitution of the present anaerobic lagoons by an aerobic treatment system.

A risk based approach has been followed to perform this validation. In the course of the pre-validation, 4 Corrective Action Requests (CARs) and 14 Clarification Requests (CRs) were raised and successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, stakeholders and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant criteria of host country (Brazil) and all relevant UNFCCC requirements for CDM. Project activity approval has yet been obtained from the DNA of Brazil since a positive validation opinion is a pre-requisite for issuance of Letter of Approval (LOA).
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 167,360 $tCO_2e$ are most likely to be achieved within the fixed crediting period (1st Jun 2009 - 31st May 2019).

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

Sao Paulo, 2009-04-19

Rainer Winter
TÜV NORD JI/CDM CP
Validation Team Leader

Essen, 2009-04-19

Erik Krupp
TÜV NORD JI/CDM CP
Final approval

# 7 REFERENCES

**Table 7-1:** Documents provided by the project proponent

| Reference | Document |
|---|---|
| /**AR**/ | Proof of receipt of letters sent to stakeholders:<br>- Public Prosecution Office of Santa Catarina – 01/09/2008<br>- Association of Municipalities of Alto Iraní. – 03/09/2008<br>- Brazilian Forum of NGOs and Social Movements – 01/09/2008<br>- FATMA – Fundação Meio Ambiente de Santa Catarina – 01/09/2008<br>- Deputy Chamber of Faxinal dos Guedes – 03/09/2008<br>- City Hall of Faxinal dos Guedes – 02/09/2008<br>- Public Prosecution office of the Federal Government – 01/09/2008<br>- Secretary of Regional Development – Xanxerê – 02/09/2008<br>- ACIX – Comercial, Industrial and Agrobusiness Association of Xanxerê – 02/09/2008 |
| /**DLO**/ | Dimensional lay out of the New Treatment System #060/2008 of 05/2008 |
| /**EI**/ | Evidences of Investment:<br><br><u>Design, equipment and trainning:</u><br>Evidence of monthly payments of R$86,000.00 through electronic financial system, according to Purchase Confirmation/PC/ signed with Tecnosan for design, supply of equipment, start up and training of personnel to operate the new system.<br><br><u>Civil works and materials:</u><br>NF 294566 Açotubo 29/ago/2008 25,054.62<br>NF 16821 Tubos Ipiranga 22/08/2008 6,687.66<br>NF 291341 Aço tubo 11/08/2008 10,800.80<br>NF036668 Gerdau 15/08/2008 9,277.31<br>NF01541 Concrexap 04/09/2008 19,564.00<br>NF099910 Joaçaba 04/09/2008 47,827.20<br>NF099909 Joaçaba 04/09/2008 84,158.94<br>NF000133 Moraes&Moraes 08/08/2008 22,710.20<br>NF 000137 Moraes&Moraes 09/09/2008 29,220.97 |
| /**ERPA**/ | Emission Reduction Purchase Agreement signed on 07/01/2008 between Avelino Bragagnolo and LCMGOELZER BRASENGE, from Florianópolis. |
| /**LAO**/ | Environmental License LAO #934/2007 - issued by FATMA on 30/10/2007 valid for 48 months |

| Reference | Document |
|---|---|
| /**OL**/ | Operating License #1398 issued by the Municipality of Faxinal dos Guedes -SC |
| /**PC**/ | Purchase Confirmation Tecnosan – 07/02/2008 |
| /**PCT**/ | Proof of Receipt by FATMA of following reports of phisical-chemical tests performed by SENAI-Chapecó:<br>#2234/08/07 - 24/08/2007 – Decanting Lagoon<br>#2233/08/07 - 24/08/2007 – Discharge Lagoon<br>#2329/08/08 - 20/08/2008 – Equalizing Tank |
| /**PDD**/ | 1.Draft Project Design Document Version 01 of 18 August 2008, hosted for public comments from 10/10/2008 to 08/11/2008.<br>2. Final PDD –Version 02 of 30/12/2008 |
| /**TR**/ | Test Report #2329/08/08 - 20/08/2008. |
| /**XCS**/ | ER Calculations Spreadsheet version 01<br>ER Calculations Spreadsheet version 02 |

**Table 7-2:** Background investigation and assessment documents

| Reference | Document |
|---|---|
| /**AMS III.I**/ | Avoidance of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems (version 6, valid from 10 Aug 07 to 09 Oct 08) |
| /**AMS III.H**/ | Methane recovery in waste water treatment (version 9, valid until 09 Oct 08) |
| /**DFL**/ | DOE/AIE Forum request letter for opportunity to assess that the “tool to calculate the emission factor for an electricity system” was correctly applied. |
| /**DNAOF**/ | Brazilian DNA Official Letter inviting the DOE to have an opportunity to assess that the “tool to calculate the emission factor for an electricity system” was correctly applied. |
| /**CPM**/ | TÜV Nord JI / CDM CP Manual (incl. CP procedures and forms) |
| /**GCSCP**/ | UNFCCC: Guidelines for completing the simplified project design document (CDM-SSC-PDD) (version 5) |

| Reference | Document |
|---|---|
| /**IPCC-GP**/ | IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000 |
| /**IPCC-RM**/ | Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual |
| /**KP**/ | Kyoto Protocol (1997) |
| /**MA**/ | Decision 17/CP. 7 (Marrakesh – Accords & Annex to decision 17/CP.7) |
| /**R7**/ | Resolution #7 of CIMGC of 05/03/2008 |
| /**R8**/ | Resolution #8 of CIMGC of 26/05/2008 |
| /**SMP**/ | Simplified modalities and procedures for small–scale clean development mechanism project activities (decision 4/CMP.1, Annex II) |
| /**VVM**/ | IETA, PCF Validation and Verification Manual (version.4) |

**Table 7-3:** Websites used

| Reference | Link | Organisation |
|---|---|---|
| /**bragagnolo**/ | www.bragagnolo.com.br | Bragagnolo |
| /**dna**/ | www.mct.gov.br | DNA of Brazil |
| /**fatma**/ | www.fatma.sc.gov.br | *Fundação do Meio Ambiente* – Santa Catarina State, Brazil – Environmental Body |
| /**ipcc**/ | www.ipcc-nggip.iges.or.jp | IPCC publications |
| /**tuv**/ | www.global-warming.de | TUV NORD JI/CDM CP |
| /**unfccc**/ | http://cdm.unfccc.int | UNFCCC |

**Table 7-4:** List of interviewed persons

| Reference | MoI[1] | | Name | Organisation / Function |
|---|---|---|---|---|
| /**IM01**/ | V | ☒ Mr. ☐ Ms | Marcos A. Bragagnolo | Avelino Bragagnolo/ Director |

| Reference | MoI[1] | | Name | Organisation / Function |
|---|---|---|---|---|
| /**IM01**/ | V | ☒ Mr.<br>☐ Ms. | Iluir José Wilfsen | Avelino Bragagnolo/ Production Manager |
| /**IM01**/ | V | ☒ Mr.<br>☐ Ms. | Armelindo Torri | Avelino Bragagnolo / Chief of Maintenance |
| /**IM02**/ | V | ☒ Mr.<br>☐ Ms. | Luis Filipe Kopp | Ambio Participações Ltda./ Consultant |
| /**IM03**/ | T | ☒ Mr.<br>☐ Ms. | Armando Fiuza | Tecnosan / Engineer |

1) Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

# ANNEX

Validation Protocol

# ANNEX : DRAFT VALIDATION PROTOCOL

**Table 1:** Mandatory Requirements for (CDM) Project Activities

| Requirement | Reference | Conclusion |
|---|---|---|
| **Parties** | | |
| 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 | OK |
| The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC. | Kyoto Protocol Art.12.2. | OK |
| The project shall have the written approval of voluntary participation from the designated national authority of each Party involved. | Kyoto Protocol Art. 12.5a,<br>CDM Modalities and Procedures §40a | (OK) |
| 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,<br>CDM Modalities and Procedures §40a | (OK) |
| 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,<br>CDM Modalities and Procedures Appendix B, § 2 | Ok. Public funding from Annex I countries is not included in project financing |
| Parties participating in the CDM shall designate a national authority for the CDM. | CDM Modalities and Procedures §29 | Yes, the only (host) party has designated a national authority for the CDM. |

| Requirement | Reference | Conclusion |
|---|---|---|
| | | |
| The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol. | CDM Modalities §30/31a | Yes, Brazil has ratified the Kyoto Protocol |
| The participating Annex I Party's assigned amount shall have been calculated and recorded. | CDM Modalities and Procedures §31b | NA |
| The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7. | CDM Modalities and Procedures §31b | NA |
| **Additionality** | | |
| 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 | OK |
| **Forecast emission reductions and environmental impacts** | | |
| The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change. | Kyoto Protocol Art. 12.5b | OK |
| **Environmental impacts** | | |
| Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out. | CDM Modalities and Procedures §37c | OK |

| Requirement | Reference | Conclusion |
|---|---|---|
| **Stakeholder involvement** | | |
| Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received. | CDM Modalities and Procedures §37b | OK |
| Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available. | CDM Modalities and Procedures §40 | OK |
| **Other** | | |
| The baseline and monitoring methodology shall be previously approved by the CDM Executive Board. | CDM Modalities and Procedures §37e | OK |
| A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectorial policies and circumstances. | CDM Modalities and Procedures §45c,d | OK |
| The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure. | CDM Modalities and Procedures §47 | OK |
| The project design document shall be in conformance with the UNFCCC CDM-PDD format. | CDM Modalities and Procedures Appendix B, EB Decision | OK, the latest version of the SSC PDD is used. |
| 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 |
| **Requirements for small-scale projects only** | | |
| The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger project activity. | Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c | OK |

| Requirement | Reference | Conclusion |
|---|---|---|
| The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and use the simplified baseline and monitoring methodology for that project category. | Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e | OK |
| If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented. | Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c | OK. It is not required by the host country. |

**Table 2:** Requirements Checklist

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| ***A. General Description of Project Activity***<br>*The project design is assessed.* | | | | | |
| **A.1. Project Boundaries**<br>*Project Boundaries are the limits and borders defining the GHG emission reduction project.* | | | | | |
| A.1.1. Are the project's spatial boundaries (geographical) clearly defined? | /PDD/ (A 4.1.4), (B.3.) /AMS III.I/ | DR | The project is located in the municipality of Faxinal dos Guedes, State of Santa Catarina, on km 13 of local Roadway 050.<br><br>However, the unique geographic identification of the project activity should be given, including geographical coordinates detailed in geographical seconds.<br><br>The methodology III.I states that the project boundary is defined as the physical geographical site where the wastewater treatment takes place. | ~~CR A1~~ | OK |
| A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined? | /PDD/ (A.4.2) /DLOI/ | DR,I | The main constructions of the project activity include the components and facilities used to mitigate GHGs are clearly defined. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **A.2. Participation Requirements** *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.* | | | | | |
| A.2.1. Which Parties and project participants are participating in the project? | /PDD/ (A.3.), (Annex 1) | DR, I | The only party involved in the project activity is Brazil (Host Party).<br>The project participants are:<br>1. Avelino Bragagnolo S/A Indústria e Comércio<br>2. AMBIO Participações Ltda. | OK | |
| A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party? | /PDD/ (A.3.) /LoA/ /dna/ | DR | In accordance with the CDM M&P at the stage of validation a Party involved may or may not have provided its approval at the time of making the PDD public. The approval of the parties involved is required at the time of requesting registration.<br>At the time of the completion of validation the LoA is pending. For the Brazilian DNA a positive validation opinion is a prerequisite for the host government approval and thus the LoA cannot be considered at the present validation stage.<br>Corresponding changes of the project documentation due to the approval process will be addressed in the final validation report. | (OK) | |
| A.2.3. Do all participating Parties fulfil the participation | /LoA/ /unfccc/ /dna/ | DR | Brazil, the host country, has ratified the Kyoto Protocol on 23rd August 2002. The Brazilian DNA assigned for CDM is the “Global Climate Change international Commission”. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| requirements as follows:<br>– Ratification of the Kyoto Protocol<br>– Voluntary participation<br>– Designated a National Authority | | | | | |
| A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance. | /PDD/ (A.4.4 & Annex 2) | DR, I | Public funding from an Annex I - country is not used to finance the project activity. | OK | |
| **A.3. Technology to be employed**<br>*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.* | | | | | |
| A.3.1. Does the project design engineering reflect current good practices? | /PDD/ (A.4.2.) /PC/ | DR, I | Yes, the project design reflects current good practices. In the PDD section A.4.2 description of the technology is provided in a condensed form. The technology is | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | /DLO/ | | environmentally safe and sound. The technology used is domestic and mature. | | |
| 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? | /PDD/ (A.4.2.) /PC/ /DLO/ | DR, I | It is a technology to avoid methane emissions, which would happen in the absence of the project activity. The components utilized are new. All components are of Brazilian origin, thus a technology transfer doesn't happen. | OK | |
| A.3.3. Does the project make provisions for meeting training and maintenance needs? | /PDD/ (B.7.2. & A.4.2.) /PC/ | DR, I | Yes, the project make provisions for meeting training and maintenance needs. The contract with TECNOSAN provides for start up and training of personnel for operation of the new aerobic treatment system. | OK | |
| **A.4. Contribution to Sustainable Development** *The project's contribution to sustainable development is assessed.* | | | | | |
| A.4.1. Has the host country confirmed that the project assists it in achieving sustainable | /dna/ | DR | The Brazilian DNA has not yet issued the LOA, in which the contribution to sustainable development is addressed and confirmed. According to DNA's rules, a positive validation opinion is a pre-requisite to issue a LoA. | (OK) | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| development? | | | | | |
| A.4.2. Will the project create other environmental or social benefits than GHG emission reductions? | /PDD/ (A.2.) | DR I | The view of the project participants on the contribution of the project activity towards sustainable development is briefly described in section A.2. of the PDD.<br>Besides GHG reduction, the project uses clean and efficient technologies and local social economic development is stimulated by the project through creating job opportunities during construction and capacity building by means of training of employees to operate a more sophisticated system. Since most of the materials and equipments which were purchased were produced in the host country, it also contributed to economic growth and increased taxes revenues for the host country and also to the development of the market for equipments and services related to more complex wastewater treatment systems. and the quality of the water that exits the system and reaches Chapecozinho river will be improved. Moreover, It increases local tax revenues and provides job opportunities to local people.<br>However, it was evidenced during the site visit that the project will not increase job opportunities during operation of the new facilities as stated in A.2. of the PDD, since the same employees that operate the actual system will receive training to operate the new one. Revision is necessary. In addition, the PP stated that project activity also leads to conservation of water, since after the project implementation, a larger portion of the water will be recirculated into the production process of the company. | ~~CR A2~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | Such claim should be explained in the PDD and supporting evidence provided to the validation team or the statement withdrawn. | | |
| **Small scale project activity** *Is it assessed whether the project qualifies as small-scale CDM project activity* | | | | | |
| A.4.3. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM? | /PDD/ (B.2.) /AMS III.I/ /SMP/ | DR | In section B.2. of the PDD it is stated why the project activity qualifies as SSC and the estimated emissions reduction are below the cap of 60tCO2e for type III projects. However, evidence of important parameters for estimating baseline emissions has not been provided yet. Please refer to CR B8. | ~~CR B8~~ | OK |
| A.4.4. Is the small scale project activity not a debundled component of a larger project activity? | /PDD/ A.4.5 /SMP/ | DR, I | No, the small scale project activity is not a debundled component of a larger project activity. But according to Appendix C of the simplified modalities and procedures for small-scale CDM project activities there are three criteria for determining the occurance of debundling. All these criteria have to be considered. Therefore revision is needed. | ~~CR A3~~ | OK |
| **A.5. General Topics** | | | | | |
| A.5.1. Has the PDD been duly filled? | /PDD/ | DR | Refer to the CARs and CRs | ~~Not yet~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| A.5.2. Has all necessary information been made available to the validator? | | DR, I | Refer to the CARs and CRs. | ~~Not Yet~~ | OK |
| ***B. Project Baseline***<br>*The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.* | | | | | |
| **B.1. Baseline Methodology**<br>*It is assessed whether the project applies an appropriate baseline methodology.* | | | | | |
| B.1.1. Does the project apply an approved methodology and the correct version thereof? | /PDD/ (B.1) /AMS III.I/ /AMS III.H/ | DR | Yes, the project applies the approved small scale methodology AMS III.I - "Avoidance of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems" (Version 6).<br><br>It also refers to approved methodology AMS-III.H., "Methane recovery in waste water treatment, version 06 , for the methane correction factor.<br><br>However, it is not mentioned the that methodology used to calculate baseline emissions is AMS III.H neither the tool utilized to calculate emission factor. All methodologies and tools used must be mentioned in section B.1. Revision is necessary. | ~~CR B1~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | | | |
| B.1.2. Are the applicability criteria in the baseline methodology all fulfilled? | /PDD/ (B.2.), /AMS III.I/ /AMS III.H/ | DR, I | The project consists of substitution of anaerobic lagoons by a aerobic system for waste treatment.<br>The project activity does not recover or combust methane in wastewater treatment facilities, unlike III.H.<br>It was evidenced during on site visit that the anaerobic lagoons are more than 2 meters deep.<br>In section B.2. of the PDD it is stated that the project activity will remain under the emissions reduction cap of 60t$CO_2$e for type III projects. However, evidences of the main parameters to estimate ERs, which are the COD (Chemical Oxygen Demand) and the volume of effluents which enter the treatment system have not been provided yet. It is necessary to provide such evidences. Please refer to CR B8. | ~~CR B8~~ | OK |
| **B.2. Baseline Scenario Determination**<br>*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.* | | | | | |
| B.2.1. What is the baseline scenario? | /PDD (B.4.)/ | DR | According to AMS III.I. and as stated in Section B.4. of the PDD, the baseline scenario is the situation where, in | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | /AMS III.I/ | | the absence of the project activity, degradable organic matter in wastewater is treated in anaerobic lagoons and methane is emitted to the atmosphere.<br>This is the continuation of the current situation (Alternative 2). | | |
| B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one? | /PDD/ (B.4.) /AMS III.I./ | DR | Two alternative scenarios are considered in the PDD:<br><br>Alternative 1: The proposed project activity without CDM. This alternative faces serious financial barriers, since there is a high investment to implement the project and there are no other incomes besides CERs.<br><br>Alternative 3: The construction of an alternative system such as anaerobic treatment with methane recovery or composting. This alternative would face even more serious barriers since the investments would be even higher and it is not common practice in the host country.<br><br>The baseline scenario is Alternative 2: The continuation of the current situation, which faces no barriers and is in compliance with current laws and regulations, and therefore is the most likely scenario. | OK | |
| B.2.3. Has the baseline scenario been determined according to the methodology? | /PDD/ (B.4.), /AMS III.I./ | DR | Yes, the baseline is determined in compliance with AMS III.I. version 6. | OK | |

| CHECKLIST QUESTION | | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| B.2.4. | Has the baseline scenario been determined using conservative assumptions where possible? | /PDD/ (B.4.) /AMS III.I./ /GCSCP/ | DR | Yes, the baseline scenario was determined according to approved methodology AMS III.I. version 6. But according to the guidelines /GCSCP/ in this part of the PDD the chosen project category has to be referenced. Also it is recommended to illustrate in a transparent manner all data used to determine the baseline emissions (preferable in a tabular form). Revision is needed. | ~~CR B2~~ | OK |
| B.2.5. | Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations? | /PDD/ (B.4.) /AMS III.I./ | DR | Yes, the baseline scenario takes into account relevant national and/or sectoral policies, macro-economic trends and political aspirations. | OK | |
| B.2.6. | Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced? | /PDD/ (B.4.) /AMS III.I./ /dna/ | DR | Yes. It is in compliance with current practices and regulations in the host country and faces no barriers. | OK | |
| B.2.7. | Have the major risks to the baseline been identified? | /PDD/ (B.4.) | DR | No major risks were identified and are not to be expected. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| **B.3. Additionality Determination** *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.* | | | | | |
| B.3.1. Is the project additionality assessed according to the methodology? | /PDD/ (B.5.), /SMP/ | DR | Yes, in section B.5 of the PDD the additionality is justified with the investment barrier approach according to attachment A to appendix B of the simplified modalities and procedures. Investment Barrier Analysis and Other Barrier Analysis are chosen.<br><br><u>Investment Barrier Analysis:</u><br><br>Since no other incomes are expected from the project activity in addition to CDM, and the installation of the aerobic system requires high investments both for construction and also higher costs during operation, conclusion can be made that the project activity without CDM is not a financially attractive option<br><br><u>Other Barrier Analysis:</u><br>Other barrier is justified in item B.5. of the PDD. However, it can not be considered a decisive barrier.<br><br>However, it is stated in section B.5. of the PDD that Alternative 3 involve significant changes in the actual wastewater treatment system, but the same argument is presented further below in section B.5, under Other barriers concerning Alternative 1, therefore it can not be | ~~CR B3~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | considered an argument to exclude Alternative 3. Revision of the text is necessary.<br><br>Although it is clear that the new system will imply extra costs for operation and maintenance (i.e.due to energy consumption and complexity of the new equipments), it is necessary to present evidence for the value of R$2,000.00 regarding operation and maintenance costs stated in section B.5. | ~~CR B4~~ | OK |
| B.3.2. Are all assumptions stated in a transparent and conservative manner? | /PDD/ (B.5.) | DR | Refer to B.3.1 | N/A | |
| B.3.3. Is sufficient evidence provided to support the relevance of the arguments made? | /PDD/ (B.5.) | DR, I | Refer to B.3.1 | N/A | |
| 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 | /PDD/ (B.5.) | DR, I /ERPA/ /PC/ | The starting date of the project activity is before the date of validation.<br><br>Evidence to prove that the incentive from CDM was seriously considered in the decision to proceed with the project activity was provided to the validators including an ERPA signed on 07/01/2008, before the Purchase Confirmation Agreement signed with TECNOSAN on 07/02/2008. This company also provided the engineering | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| activity? | | | services for a similar project, at Celulose Irani, another paper factory in the region.<br>The PP started to consider the change of the treatment system after the registration of this project (ref 1410) under the CDM. | | |
| **B.4. Calculation of GHG Emission Reductions – Project emissions**<br>*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.* | | | | | |
| B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner? | /PDD/ (B.6.) (B.7) /XCS/ | DR, I | In B.6.2. of the PDD it is necessary to include $MCF_s$, $DOC_f$ and F as parameters available at validation, since sludge may be sent to landfill and emissions from its anaerobic decay might need to be accounted. It is necessary also to include OM and BM weighting factors. In addition, $COD_y$ should be excluded from B.6.2, since it should be a monitored parameter. Description of $MCF_{aerobic}$ is incorrect<br><br>In B.7.1., $DOC_{y,s}$ should be included as a monitored parameter and description of $COD_y$ is incorrect. Revision is necessary.<br><br>For calculation of project emissions, the methodology | ~~CR B5~~<br><br>~~CR B6~~<br><br>~~CAR B1~~ | OK<br><br>OK<br><br>OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | does not indicate that only the months of average temperature above 15°C have to be considered, as it was described in B.7.1 and calculated in the spreadsheet.<br><br>In section B.6.3. it is stated that emissions from electricity are zero, because the plant generates its own electrical energy form renewable sources. However, it was evidenced during the on site visit that the energy generation of the factory is currently not enough to cover its needs and therefore electrical energy is also being acquired from the electricity utility company of Santa Catarina State. Thus, emissions from energy consumption of the new equipments should be estimated accordingly and included in project emission calculations. Also, EF calculation method should be clearly described, including weighting of building and operating margins in case of combined margin is used and parameter EF should be included as a monitored parameter if calculated ex-post. In general all factors of the listed calculations have to be described (i.e. $DOC_y$, $MCF_s$, $DOC_f$, F). | ~~CAR B2~~ | OK |
| B.4.2. Have conservative assumptions been used when calculating the project emissions | /PDD/ (B.6.) (B.7) /XCS/ | DR | Refer to B.4.1. | N/A | |
| B.4.3. Are uncertainties in the project emission estimates properly addressed? | /PDD/ (B.6.) (B.7) /XCS/ | DR | Refer to B.4.1. | N/A | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| **B.5. Calculation of GHG Emission Reductions – Baseline emissions**<br>*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.* | | | | | |
| B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner? | /PDD/ (B.6.) /AMS III.I/ /AMS III.H/ | DR | The calculation of the volumetric loading rate of COD should be made transparent in the PDD.<br><br>Evidences of the parameters $COD_y$ and $Q_{ww}$ were insufficient. New consistent evidences should be provided. | ~~CR B7~~<br><br>~~CR B8~~ | OK<br><br>OK |
| B.5.2. Have conservative assumptions been used when calculating the baseline emissions | /PDD/ (B.6.) /AMS III.I/ /AMS III.H/ | DR | Please refer to B.5.1. | N/A | |
| B.5.3. Are uncertainties in the baseline emission estimates properly addressed? | /PDD/ (B.6.) /AMS III.I/ /AMS III.H/ | DR | No uncertainties are expected in estimating the baseline emissions. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **B.6. Calculation of GHG Emission Reductions – Leakage**<br>*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.* | | | | | |
| B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner? | /PDD/ (B.6.) /AMS III.I/ | DR | Leakage does not need to be considered for this project, because no equipment will be transferred. All equipment will be new. | OK | |
| B.6.2. Have conservative assumptions been used when calculating the leakage emissions? | /PDD/ (B.6.) /AMS III.I/ | DR | Not applicable since leakage is not considered. | N/A | |
| B.6.3. Are uncertainties in the leakage emission estimates properly addressed? | /PDD/ (B.6.) /AMS III.I/ | DR | Not applicable since leakage is not considered. | N/A | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| **B.7. Emission Reductions** *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.* | | | | | |
| B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change. | /PDD/ (B.6.) /XCS/ | DR, I | The CARs/CRs given in section B have to be closed satisfactorily before forming an opinion. | ~~Not yet~~ | OK |
| **B.8. Monitoring Methodology** *It is assessed whether the project applies an appropriate monitoring methodology.* | | | | | |
| B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner? | /PDD/ (B.7.) /AMS III.I/ | DR I | Several parameters in B.7.1 have to be altered:<br>- For parameter $S_y$, it is states the sludge will be carried to the boiler, but the destination of the sludge is not defined yet.<br>- For the parameter Temperature, it is stated that the project developer has a weather monitoring station at the site, but that was not evidenced.<br>- Description of parameter $COD_y$ in section B.7.1 of the PDD is incorrect. It is stated that the measurement will be measured by the project developer but it was stated by Mr Filipe Kopp that it will actually be performed by a external laboratory. The measuring interval has to be specified. | ~~CAR B3~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | - It is stated that for parameter $Q_{ww}$, on line measurements will take place, which was not what was declared to the validator; and that only months with average temperature above 15°C will be accounted to calculate emission reductions, but the methodology does not indicate that only these months are to be accounted for project emissions. Consistent cross-check procedures have to be in place, considering it is one of the crucial parameters for calculation of emission reductions.<br>- Evidence of the value of data for parameter $EC_y$ has to be presented.<br>- In OM and BM it is stated that the source of data is the annual value of 2007 but that the emission factor will be calculated ex-post monthly.<br>Section B.7 needs to be more detailed, including responsibilities, location, type and accuracy of metering devices, data collection , storage (including time) and reporting procedures, measurement intervals, QA/QC procedures for all parameters, data substitution procedures, maintenance and calibration of metering devices, training of monitoring personnel.<br><br>Please also refer to B.4.1. | | |
| 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 | /PDD/ (B.7.2.) | DR | Please refer to B.8.1 | N/A | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| activity, whichever occurs later? | | | | | |
| **B.9. Monitoring of Project Emissions** *It is established whether the monitoring plan provides for reliable and complete project emission data over time.* | | | | | |
| B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period? | /PDD/ (B.7.) | DR | Please refer to B.8.1 | N/A | |
| B.9.2. Are the choices of project GHG indicators reasonable and conservative? | /PDD/ (B.7.) | DR | Please refer to B.8.1 | N/A | |
| B.9.3. Is the measurement method clearly stated for each GHG value to be | /PDD/ (B.7.) | DR | Please refer to B.8.1 | N/A | |

| CHECKLIST QUESTION | | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|---|
| | monitored and deemed appropriate? | | | | | |
| B.9.4. | Is the measurement equipment described and deemed appropriate? | /PDD/ (B.7.) | DR | Please refer to B.8.1 | N/A | |
| B.9.5. | Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements? | /PDD/ (B.7.) | DR | Please refer to B.8.1 | N/A | |
| B.9.6. | Is the measurement interval identified and deemed appropriate? | /PDD/ (B.7.) | DR | Please refer to B.8.1 | N/A | |
| B.9.7. | Is the registration, monitoring, measurement and reporting procedure defined? | /PDD/ (B.7.) | DR | Please refer to B.8.1 | N/A | |
| B.9.8. | Are procedures identified for maintenance of monitoring equipment | /PDD/ (B.7.) | DR | Please refer to B.8.1 | N/A | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| and installations? Are the calibration intervals being observed? | | | | | |
| 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) | /PDD/ (B.7.) | DR | Please refer to B.8.1 | N/A | |
| **B.10. Monitoring of Baseline Emissions** *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.* | | | | | |
| B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period? | /PDD/ (B.7.) | DR | Please refer to B.4.1. and B.8.1. | N/A | |
| B.10.2. Are the choices of baseline GHG indicators | /PDD/ (B.7.) | DR | Yes, they are in line with the methodology. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| reasonable and conservative? | | | | | |
| B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate? | /PDD/ (B.7.) | DR | Please refer to B.4.1. and B.8.1. | N/A | |
| B.10.4. Is the measurement equipment described and deemed appropriate? | /PDD/ (B.7.) | DR | Please refer to B.4.1. and B.8.1. | N/A | |
| B.10.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements? | /PDD/ (B.7.) | DR I | Please refer to B.4.1. and B.8.1. | N/A | |
| B.10.6. Is the measurement interval for baseline data identified and deemed appropriate? | /PDD/ (B.7.) | DR | Please refer to B.4.1. and B.8.1. | N/A | |
| B.10.7. Is the registration, monitoring, | /PDD/ (B.7.) | DR | Please refer to B.4.1. and B.8.1. | N/A | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| measurement and reporting procedure defined? | | | | | |
| B.10.8. Are procedures identified for maintenance of monitoring equipment and installations? Are the calibration intervals being observed? | /PDD/ (B.7.) | DR | Please refer to B.4.1. and B.8.1. | N/A | |
| 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) | /PDD/ (B.7.) | DR | Please refer to B.4.1. and B.8.1. | N/A | |
| **B.11. Monitoring of Leakage** *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.* | | | | | |
| B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary | /PDD/ (B.7.) | DR | No equipment will be transferred to or from the project activity, hence leakage is not to be considered | N/A | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| for determining leakage? | | | | | |
| B.11.2. Are the choices of project leakage indicators reasonable and conservative? | /PDD/ (B.7.) | DR | See comment above. | N/A | |
| B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate? | /PDD/ (B.7.) | DR | See comment above. | N/A | |
| **B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts** *It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.* | | | | | |
| B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country? | /PDD/ (B.7.) (D.1) | DR | No, the monitoring of sustainability indicators is not required according to Brazilian legislation. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts? | /PDD/ (B.7.) (D.1) | DR | See comment in B.12.1. | N/A | |
| B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country? | /PDD/ (B.7.) (D.1) | DR | See comment in B.12.1. | N/A | |
| **B.13. Project Management Planning** *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.* | | | | | |
| B.13.1. Is the authority and responsibility of overall project management clearly described? | /PDD/ (B.7.) | DR | No, the authority and responsibility of overall project management has not been clearly described in the PDD. | ~~CR B9~~ | OK |
| B.13.2. Are procedures identified for training of monitoring personnel? | /PDD/ (B.7.) | DR I | Please refer to B.8.1. | N/A | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions? | /PDD/ (B.7.) | DR | There are back up pumps in case of failure of equipment. Besides that, no emergencies are envisaged that would result in unintended emissions. | OK | |
| B.13.4. Are procedures identified for review of reported results/data? | /PDD/ (B.7.) | DR | Please refer to B.8.1. | N/A | |
| B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting? | /PDD/ (B.7.) | DR | Please refer to B.8.1. | N/A | |
| ***C. Duration of the Project/ Crediting Period*** *It is assessed whether the temporary boundaries of the project are clearly defined.* | | | | | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| C.1. Are the project's starting date and operational lifetime clearly defined and evidenced? | /PDD/ (C.1.) | DR | The starting date of the project as 1/11/2008 indicated in section C1.1.1, contradicts the statement on the first paragraph of section B.5. and the expected operational lifetime is defined as more than 21 years in Section C.1.2. of the PDD. It should be stated the number of years and months and evidence of this information provided | ~~CR C1~~ | OK |
| C.2. Is the start of the crediting period clearly defined and reasonable? | /PDD/ (C.2.) | DR | The starting date of the crediting period in PDD is 01/06/2009 and that is reasonable.<br>However, it should be added "but not earlier than registration" | ~~CR C2~~ | OK |
| ***D. Environmental Impacts***<br>*Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.* | | | | | |

| CHECKLIST QUESTION | | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|---|
| D.1. | Has an analysis of the environmental impacts of the project activity been sufficiently described? | /PDD/ (D.1.) | DR | The effects of the project activity are addressed appropriately and are assessed as not significant. | OK | |
| D.2. | Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved? | /PDD/ (D.1.) | DR I | No, there are not. However, in section D.1. of the PDD it is stated that all applicable licenses have been obtained, but during on site visit it was evidenced that a License for the construction of the new treatment system is necessary and have not been provided to the validators. | ~~CAR D1~~ | OK |
| D.3. | Will the project create any adverse environmental effects? | /PDD/ (D.1.) | DR | Only minor adverse environmental impacts are expected from the project during construction time, e.g. dust during construction, solid waste. But these impacts are assessed as not significant and controllable. | OK | |
| D.4. | Are transboundary environmental impacts considered in the analysis? | /PDD/ (D.1.) | DR | No transboundary effects are expected. | OK | |
| D.5. | Have identified environmental impacts been addressed in the project design? | /PDD/ (D.1.) | DR | Yes, in section D.1. several environmental impacts are identified and addressed through control methods. | OK | |
| D.6. | Does the project comply with environmental | /PDD/ (D.1.) | DR | Yes, it does. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| legislation in the host country? | | | | | |
| **For Small- scale projects** | | | | | |
| D.7. Does host country legislation require an analysis of the environmental impacts of the project activity? | | | Refer to D.2 | ~~CAR D1~~ | OK |
| D.8. Does the project comply with environmental legislation in the host country? | | | Refer to D.2 | ~~CAR D1~~ | OK |
| D.9. Will the project create any adverse environmental effects? | | | Refer to D.3 | OK | |
| D.10. Have environmental impacts been identified and addressed in the PDD? | | | Refer to D.5 | OK | |
| ***E. Stakeholder Comments*** *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.* | | | | | |

| CHECKLIST QUESTION | | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| E.1. | Have relevant stakeholders been consulted? | /PDD/ (E.1.) /AR/ /dna/ /R7/ | DR | Yes, relevant local stakeholders were informed about the project details through letters. For a list of stakeholders refer to table 7-1. | OK | |
| E.2. | Have appropriate media been used to invite comments by local stakeholders? | /PDD/ (E.1.) /AR/ /dna/ /R7/ | DR | Yes, the stakeholder consultation was conducted in form of letters sent to stakeholders including description of the project activity, with proof of receipt. | OK | |
| E.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? | /dna/ /R7/ | | The document described in Annex 3 was not published in the website indicated in the invitation letter, as required by Resolution #7 of the Brazilian DNA | ~~CAR E1~~ | OK |
| E.4. | Is a summary of the stakeholder comments received provided? | /PDD/ (E.2.) | DR | No comments have been received so far. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| E.5. Has due account been taken of any stakeholder comments received? | /PDD/ (E.3.) | | Not applicable as no comment has been received yet. | N/A | |

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

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| CAR B1<br>For calculation of project emissions, the methodology does not indicate that only the months of average temperature above 15°C have to be considered, as it was described in B.7.1 and calculated in the spreadsheet. | Section B | The project emissions from aerobic wastewater treatment during the months with an average temperature below 15ºC were included in version 02 of the PDD. The baseline emissions will not be considered for those months, according to the AMS.III.I. | The PDD and Excel Spreadsheet were changed accordingly. CAR closed. |
| CAR B2<br>In section B.6.3. it is stated that emissions from electricity are zero, because the plant generates its own electrical energy form renewable sources. However, it was evidenced during the on site visit that the energy generation of the factory is currently not enough to cover its needs and therefore electrical energy is also being acquired from the electricity utility company of Santa Catarina State. Thus, emissions from energy consumption of the new equipments should be estimated accordingly and included in project emission calculations. Also, EF calculation method should be clearly described, including weighting of building and operating margins in case of combined margin is used and parameter EF should be included as a monitored parameter if calculated ex-post. . In general all factors of the listed calculations have to be described (i.e. $DOC_y$, $MCF_s$, $DOC_f$, F). | Section B | Power project emissions: project emissions from power consumption is considered in version 02 of the PDD. The calculations and monitoring plan were updated accordingly. The *ex-ante* estimations for energy consumption were obtained from the installed capacity of the new equipments multiplied by the expected working hours.<br>Electricity emission factor: the emission factor from the National Interconnected System will be calculated *ex-post*. The value calculated for 2007 supplied by the Brazilian DNA will be used for the purpose of emission reduction estimation.<br>Factors: the parameters were | The PDD and Excel Spreadsheet were changed accordingly. CAR closed. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| | | described in version 02 of the PDD. | |
| CAR B3<br>Several parameters in B.7.1 have to be altered:<br>- For parameter $S_y$, it is states the sludge will be carried to the boiler, but the destination of the sludge is not defined yet.<br>- For the parameter Temperature, it is stated that the project developer has a weather monitoring station at the site, but that was not evidenced.<br>- Description of parameter $COD_y$ in section B.7.1 of the PDD is incorrect. It is stated that the measurement will be measured by the project developer but it was stated by Mr Filipe Kopp that it will actually be performed by a external laboratory. The measuring interval has to be specified.<br>- It is stated that for parameter $Q_{ww}$, on line measurements will take place, which was not what was declared to the validator; and that only months with average temperature above 15°C will be accounted to calculate emission reductions, but the methodology does not indicate that only these months are to be accounted for project emissions. Consistent cross-check procedures have to be in place, considering it is one of the crucial parameters for calculation of emission reductions.<br>- Evidence of the value of data for parameter $EC_y$ has to be presented.<br>- In OM and BM it is stated that the source of data is the annual value of 2007 but that the emission factor will be calculated ex-post monthly. | Section B | Sludge: It is expected to burn the sludge in boilers. If it is not possible to use the project developer's boiler, the material can be used in other companies in the region. Otherwise the sludge can be used as fertilizer in their own plantation.<br>Temperature and COD: The project developer will monitor temperature and COD on-site, using the CDM revenues for the necessary investments. In case it is not possible, public and official data applicable to the region will be used for temperature and external laboratory for analysing the COD.<br>Volume: a flow meter with low uncertainty will be installed and it will be maintained and calibrated according to manufacturer's specifications.<br>Energy consumption: an equipment list and its installed capacity was added in the calculation spreadsheet and it is the source of EC calculation.<br>Emission factor: The average value from 2007 was used for emission reduction estimations in the PDD. | The PDD and Excel Spreadsheet were changed accordingly. Cross-checking measures were included.<br>CAR is closed. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
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| Section B.7 needs to be more detailed, including responsibilities, location, number, type and accuracy of metering devices, data collection , storage (including time) and reporting procedures, measurement intervals, QA/QC procedures for all parameters, data substitution procedures, maintenance and calibration of metering devices, training of monitoring personnel. | | For the monitoring period, the emission factor will be determined *ex-post*, as published by the Brazilian DNA.<br>Monitoring plan: All applicable information was included in version 02 of the PDD. | |
| CAR D1<br>No, there are not. However, in section D.1. of the PDD it is stated that all applicable licenses have been obtained, but during on site visit it was evidenced that a License for the construction of the new treatment system is necessary and have not been provided to the validators. | Section D | The necessary license was requested to the environmental agency and a copy of the documentation has been forwarded to the DOE. | Preliminary License # 607/2008, issued by FATMA on 21/11/2008. It waives the need for an Installation License.<br>CAR closed |
| CAR E1<br>The document described in Annex 3 was not published in the website indicated in the invitation letter, as required by Resolution #7 of the Brazilian DNA. | Section E | The Annex III file is now made available at the project website on http://www.ambiosa.com.br/contents/pdf/bragagnolo.zip. Written copies of the file Annex III were only available, under request, in accordance with resolution # 7 of 05/03/2008, art. 3º §5. | The file is available at the website.<br>CAR is closed. |
| CR A1<br>The unique geographic identification of the project activity should be given, including geographical coordinates detailed in geographical seconds | Section A | The address of the project plant identifies the unique geographic location. The GPS coordinates were included in section A.4.1.4 of the PDD version 02. | OK.Coordinates were included. CR closed |
| CR A2<br>It was evidenced during the site visit that the project will | Section A | New jobs were necessary during the implementation of the project | Ok. Section A.2. was revised accordingly. |

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| not increase job opportunities during operation of the new facilities as stated in A.2. of the PDD, since the same employees that operate the actual system will receive training to operate the new one. Revision is necessary. In addition, the PP stated that project activity also leads to conservation of water, since after the project implementation, a larger portion of the water will be recirculated into the production process of the company. Such claim should be explained in the PDD and supporting evidence provided to the validation team or the statement withdrawn. | | activity. Additional tasks will be necessary to operation and maintenance of the new pumps and aerators. Some chemical analysis that would not be necessary without the CDM. It is expected that some water can be reutilised, but it can be demonstrable only after the system operation. The statement of creating new jobs during the operation and the conservation of water were excluded in version 02 of the PDD. | CR closed |
| CR A3<br>The small scale project activity is not a debundled component of a larger project activity. But acc. to Appendix C of the simplified modalities and procedures for small-scale CDM project activities there are three criteria for determining the occurance of debundling. All these criteria have to be considered. Therefore revision is needed. | | The fact that there is not any other project activity being developed by the same project participants is enough to demonstrate that the project activity is not a debundling of a larger activity. All the criteria were discussed in version 02 of the PDD. | Section A.4.5. was revised accordingly. CR closed |
| CR B1<br>It is not mentioned that the methodology used to calculate baseline emissions is AMS III.H neither the tool utilized to calculate emission factor. All methodologies and tools used must be mentioned in section B.1. Revision is necessary.. | Section B | All methodologies and tools were included in version 02 of the PDD. | OK. CR closed. |
| CR B2<br>the baseline scenario was determined according to approved methodology AMS III.I. version 6. But according to the guidelines /GCSCP/ in this part of the | Section B | The references to the sectoral scope and project category were included in version 02 of the PDD. | Ok. Sections B.4 and B.5 of the PDD was changed accordingly. CR closed |

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| PDD the chosen project category has to be referenced . Also it is recommended to illustrate in a transparent manner all data used to determine the baseline emissions (preferable in a tabular form). Revision is needed. | | | |
| CR B3<br>It is stated in section B.5. of the PDD that Alternative 3 involve significant changes in the actual wastewater treatment system, but the same applies for the project activity, therefore it can not be considered an argument to exclude this Alternative. Revision of the text is necessary. | Section B | Alternative 3 involves a much higher level of complexity, would require a higher investment, and presents a higher risk since this technology is not used in the host country in the paper and pulp industry. It is not a realistic alternative and thus it was excluded from the additionality assessment. Section B.4 and B.5 were revised to make the text more clear. | The corresponding sections were revised accordingly. In fact, this kind of alternative is not common practice in the host country and would doubtless face higher financial, technical and common practice barriers than the implementation of the project activity (aerobic system).<br>CR closed. |
| CR B4<br>Although it is clear that the new system will imply extra costs for operation and maintenance (i.e.due to energy consumption and complexity of the new equipments), it is necessary to present evidence for the value of R$2,000.00 regarding operation and maintenance costs stated in section B.5. | Section B | The operation of the pumps and aeration system will cost to the project developer R$ 689,470 per year on electrical energy. The maintenance costs were conservatively ignored. | The list of equipment and calculation of the energy consumption were included in the calculation spreadsheet.<br>Evidence for the price of electricity consumption was |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
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| | | | provided to the DOE. CR closed. |
| CR B5<br>In B.6.2. of the PDD it is necessary to include $MCF_s$, $DOC_f$ and F as parameters available at validation, since sludge may be sent to landfill and emissions from its anaerobic decay might need to be accounted, as well as OM and BM emission factors. In addition, $COD_y$ should be excluded from B.6.2, since it should be a monitored parameter. Describtion of $MCF_{aerobic}$ is incorrect | Section B | The section B.6.2 was updated in version 02 of the PDD to comply with the possibility of sending the sludge to a landfill. Even if it is not expected. | Section B.6.2 was revised accordingly. The weightings of OM and BM were included in section B.6.1.<br>CR closed. |
| CR B6<br>In B.7.1., $DOC_{y,s}$ should be included as a monitored parameter description of $COD_y$ is incorrect. Revision is necessary. | Section B | The section B.7.1 was updated in version 02 of the PDD to comply with the possibility of sending the sludge to a landfill. Even if it is not expected. | Section B.7.1 was revised accordingly.<br>CR closed. |
| CR B7<br>The calculation of the volumetric loading rate of COD should be made transparent in the PDD. | Section B | The volumetric loading rate is clearly demonstrated in the excel file available during validation. The parameters used are COD, volume of wastewater and lagoon volume. | The equation was included in section B.6.3. of the PDD and in the excel spreadsheet<br>CR closed. |
| CR B8<br>Evidences of the parameters $COD_y$ and $Q_{ww}$ were insufficient. In general all factors of the listed calculations have to be described (i.e. $DOC_y$, $MCF_s$, $DOC_f$, F). New consistent evidences should be provided. | Section B | The volume of wastewater in baseline is the actual volume produced by the project developer's plant. No significant changes are expected due to the project activity. No flow meter was actually installed during the site visit. Thus, an | The determination of the average flow is detailed and included in the calculation spreadsheet. The previous value given in the published PDD |

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| | | estimation of the volume were executed and the flow of 203m³/h was obtained. The outflow of the equalizer tank was closed and the difference of volume in one hour is the average flow. The COD was determined by external laboratory. | was incorrect and evidence of the new value (test by external laboratory) was available to TUV. CR is closed. |
| CR B9<br>The authority and responsibility of overall project management has not been clearly described in the PDD. | Section B | Avelino Bragagnolo represented by the effluent sector will be responsible for the overall management and the data collection. The version 02 of the PDD considers this information. | Section B.7 was revised accordingly.<br>CR closed. |
| CR C1<br>The starting date of the project as 1/11/2008 indicated in section C1.1.1, contradicts the statement on the first paragraph of section B.5. and the expected operational lifetime is defined as more than 21 years in Section C.1.2. of the PDD. It should be stated the number of years and months and evidence of this information provided | Section C | 07/02/2008 – technical proposal from Tecnosan to supply the equipments<br>01/11/2008 – expected date to start operation of the new system<br>The version 02 of the PDD considered the purchase confirmation signed with the equipment supplier as the starting date of the project activity. Tecnosan can confirm that all equipments if properly maintained can last for more than 30 years. | Sections C.1.1 and C1.2. were revised accordingly.<br>The date of 07/02/2008 is the date when the technical proposal was signed with Tecnosan.<br>The life time of project was confirmed by Tecnosan. Also PDD section C1.2. was revised.<br>CR closed |

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| CR C2<br>The starting date of the crediting period in PDD is 01/01/2009 and that is reasonable.<br>However, it should be added “but not earlier than registration” | Section C | The version 02 of the PDD included the required addition. Also the starting date of crediting period was changed to 01.06.09. | Sections C.2.2.1 was revised accordingly. CR closed. |

# CERTIFICATES

TÜV NORD

**CERTIFICATE OF APPOINTMENT**

**Mr. Dipl-Ing. Rainer Winter**

born on 1963-02-21

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

**TÜV NORD JI/CDM Senior Assessor**

The present appointment will terminate on 2010-07-05
Certification registration No. 04 02 154-03

Essen, 2007-07-06

Deputy of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH

TÜV NORD

**CERTIFICATE OF APPOINTMENT**

**Mr. Dipl.-Ing. Eric Krupp**

born on 1971-06-25

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

**TÜV NORD JI/CDM Senior Assessor**

The present appointment will terminate on 2010-07-05
Certification registration No. 06 05 01 - 017

Essen, 2007-07-06

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH

TÜV NORD

**CERTIFICATE OF APPOINTMENT**

**Ms. Maria Carolina Crisci Coelho**

born on 1977-01-01

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby re-appointed as

**TÜV NORD JI/CDM Expert**

The present appointment will terminate on 2012-02-24
Certification registration No. 09 02 01 - 015

Essen, 2009-02-25

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH