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Validation Report

ZERO EMISSIONS TECHNOLOGIES S.A.

VALIDATION OF THE CDM-PROJECT:

"Cooperativa Lar Wastewater Treatment and Energy Generation Project"

REPORT NO. 600500277

29 April 2010

TÜV SÜD Industrie Service GmbH
Carbon Management Service
Westendstr. 199 - 80686 Munich – GERMANY

Report No.	Date of first issue	Revision No.	Revision Date	Certificate No.
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Subject: Validation of the CDM Project "**Cooperativa Lar Wastewater Treatment and Energy Generation Project"**

Accredited TÜV SÜD Unit:	**TÜV SÜD Contract Partner:**
TÜV SÜD Industrie Service GmbH Certification Body "climate and energy" Westendstr. 199 80686 Munich Germany	TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199 80686 Munich Germany
Project Participant(s): **Cooperativa Agroindustrial Lar** Avenida Brasilia, nº 1220, Condá, City of Medianera, ZIP 85884-000, Parana, Brazil **Zeroemissions do Brasil Ltda.** Avenida das Américas 3500, Ed. Toronto 1000, Condominio Le Monde, Barra da Tijuca, City of Rio de Janeiro, ZIP 22640-102, Rio de Janeiro, Brazil **Zero Emissions Technologies SA** Campus Palmas Altas, Building B.1st Floor, Seville, ZIP 41014, Andalucia, Spain	**Project Site(s):** Slaughterhouse of the industrial unit of chicken Rod. BR277, km 653, Agrocafeeira, Matelandia, State of Paraná, South Brazil GPS coordinates: Between lagoons 1 and 2 (new biodigesters): o S 25º 12.1577' (-25.2026°) o W 53º 57.1925 (-53.9532°) Accuracy of 25 m. Existing flotation tank: o S 25º 12.2618' (-25.2043°) o W 53º 57.1302' (-53.9521°) Accuracy of 5.5m

Project Title:	**"Cooperativa Lar Wastewater Treatment and Energy Generation Project"**		
Applied Methodology / Version:	AMS I.D, version 15 AMS III.I, version 08, AMS III.H, version 13	**Scope(s):** **Technical Area(s):**	**1,13** **1.1, 13.2**

First PDD Version (GSP):		**Final PDD version:**	
Date of issuance:	18-05-2009[1]	Date of issuance:	10-02-2010
Version No.:	01	Version No.:	07
Starting Date of GSP	15-05-2009		

Estimated Annual Emission Reduction:	21,695 tCO_2e

Assessment Team Leader:	**Veto Person:**
Johann Thaler	--
Further Assessment Team Members:	**Responsible Certification BodyMembers:**
---	Cuiyun Zhang
Trainees:	
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[1] Due to a typing error, the date in the GSP PDD was wrongly informed with 18-05-2009 instead of 08-05-2009.

Summary of the Validation Opinion:

☒ The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence for the determination of the project's fulfilment of all stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM. Therefore, TÜV SÜD recommends the project for registration by the CDM Executive Board if the letters of approval of all Parties involved will be available before the expiring date of the applied methodology(ies) or the applied methodology version respectively.

☐ The review of the project design documentation and the subsequent follow-up interviews have not provided TÜV SÜD with sufficient evidence for the determination of the project's fulfilment of all stated criteria. Therefore, TÜV SÜD will not recommend the project for registration by the CDM Executive Board and will inform the project participants and the CDM Executive Board of this decision.

Abbreviations

AMS	Approved Methodology Small scale
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction
CM	Combined Margin
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
COD	Chemical Oxygen Demand
CR / CL	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission Reduction
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	GreenHouse Gas(es)
GSP	Global Stakeholder Process
HDPE	High Density PolyEthylene
IPCC	Intergovernmental Panel on Climate Change
IRL	Information Reference List
KP	Kyoto Protocol
LAR	Cooperativa Agroindustrial Lar
MP	Monitoring Plan
NGO	Non Governmental Organisation
OM	Operational Margin
PDD	Project Design Document
PP	Project Participant
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	United Nations Framework Convention on Climate Change

VVM	Validation and Verification Manual

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1 INTRODUCTION

1.1 Objective

The objective of the validation process is to provide an independent assessment, by a third party (Designated Operational Entity = DOE), of a proposed project activity. The assessment involves the evaluation of the project basis and design identified in the Project Design Document(PDD) using the defined criteria outlined by the registration under the Clean Development Mechanism (CDM). Validation is part of the CDM project cycle and results in a conclusion by the executing DOE on whether a project activity is valid to be submitted for registration to the CDM Executive Board (CDM-EB). The ultimate decision on the registration of a proposed project activity rests with the CDM-EB and the Parties involved.

The project addressed in this validation report has been submitted under the project title:

"Cooperativa Lar Wastewater Treatment and Energy Generation Project"

1.2 Scope

The scope of any assessment is defined by the underlying legislation, regulation and guidance given by relevant entities or authorities. In the case of CDM project activities, the scope is set by:

- The Kyoto Protocol, in particular § 12 and modalities and procedures for the CDM
- Decision 2/CMP1 and Decision 3/CMP.1 (Marrakech Accords)
- Further COP/MOP decisions with reference to the CDM (e.g. decisions 4 – 8/CMP.1)
- Decisions and specific guidance outlined by the EB which are published under http://cdm.unfccc.int
- Guidelines for Completing the Project Design Document (CDM-PDD), and the Proposed New Baseline and Monitoring Methodology (CDM-NM)
- Baselines and monitoring methodologies (including GHG inventories)
- Management systems and auditing methods
- Environmental issues relevant to the sectoral scope applied for
- Applicable environmental and social impacts, and aspects of CDM project activity
- Sector specific technologies and their applications
- Current technical and operational knowledge of the specific sectoral scope and information on best practice

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

Once TÜV SÜD receives a first PDD version, it is made publicly available on the UNFCCC website and on TÜV SÜD's website, which initiates a 30 day global stakeholder consultation process (GSP) In special circumstances, such as when certain conditions allow the GSP to be repeated, a request to revise the PDD will be processed. The original PDD and the modified PDD form the basis for the final evaluation. Information on both PDD's is presented on page 2 of this report.

The purpose of a validation is its use to demonstrate compliance/ non-compliance of the projects with all stated and valid CDM requirements. Additionally the purpose of validation is also to help enable the registration of CDM projects which in turn is only a part of the total CDM project cycle.

Therefore, TÜV SÜD cannot be held liable by any party for decisions made, or not made, based on the validation opinion, which will go beyond this purpose.

2 METHODOLOGY

The project assessment is based on the "Clean Development Mechanism Validation and Verification Manual" version 1.1 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s) and relevant host country experience for evaluating the CDM project activity are appointed. Once the project is made available for the stakeholder consultation process, members of the team carry out the desk review, follow-up actions, resolution of issues identified, and finally the preparation of the validation report. The prepared validation report and other supporting documents then undergo an internal quality control by the CB "climate and energy" before being submitted to the CDM-EB.

In order to ensure transparency, assumptions must be clear and explicitly stated and background material must also be clearly referenced. TÜV SÜD developed a methodology-specific protocol customized for the project. The protocol demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the assessment team, and the results from validating the identified criteria.

The validation protocol serves the following purposes:

- The organization of details and provision of clarifications on the requirements a CDM project is expected to meet;
- Transparency of the validation process where the validator has to document how a particular requirement has been validated, as well as the results of the validation and any adjustments, if any, made to the project design.

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

Validation Protocol Table 1: Conformity of Project Activity and PDD				
Checklist Topic / Question	**Reference**	**Comments**	**PDD in GSP**	**Final PDD**
The checklist is organised in sections following the arrangement of the applied PDD version. Each section is then further sub-divided. The lowest level constitutes a checklist question / criterion.	*The section gives reference to documents in which the answer to the checklist question or item is found in case the comment refers to documents*	*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. In some cases sub-checklists are applied indicating yes/no decisions on the compliance with the stated*	*The section is used to present conclusions based on the assessment of the first PDD version. The PDD is either acceptable based on evidence provided* ***þ*** *or a* ***Corrective Action Request (CAR)*** *is issued 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.* ***Forward Action Request*** *is issued to highlight issues*	*In this section,conclusions are presented in the same manner based on the assessment of the final PDD version and further documents including assumptions presented in the documentation.*

	other than the PDD.	*criterion. Any **Request** has to be substantiated within this column.*	*related to project implementation that require review during the first verification.*	

Validation Protocol Table 2: Resolution of Corrective Action and Clarification Requests			
Clarifications and corrective action requests	**Ref. to table 1**	**Summary of project owner response**	**Validation team conclusion**
If the conclusions from table 1 are either a Corrective Action, a Clarification or a Forward Action Request, these should be listed in this section.	*Reference to the checklist question number in Table 1 where the issue is explained.*	*The responses given by the client or other project participants during communication with the validation team should be summarised in this section.*	*This section should summarise the discussion on and revision to project documentation together with the validation team's responses and final conclusions. The conclusions should be reflected in Table 1, under "Final PDD".*

In case of a denial of the project activity more detailed information on this decision will be presented in Table 3.

Validation Protocol Table 3: Unresolved Corrective Action and Clarification Requests		
Clarifications and corrective action requests	**Id. of CAR/CR**	**Explanation of the Conclusion for Denial**
If the final conclusions from table 2 results in a denial, the referenced request should be listed in this section.	*Identifier of the Request.*	*This section should present a detailed explanation on why the project is finally considered not to be in compliance with a criterion providing a clear reference to the requirement which is not complied with.*

The completed validation protocol is enclosed in Annex 1 to this report.

2.1 Appointment of the Assessment Team

According to the technical scopes and experiences in the sectoral or national business environment, TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV SÜD certification body "climate and energy". The composition of an assessment team has to be approved by the Certification Body (CB) to assure that the required skills are covered by the team. The CB TÜV SÜD operates four qualification levels for team members that are assigned by formal appointment rules:

- Assessment Team Leader (ATL)
- Greenhouse Gas Auditor (GHG-A)
- Greenhouse Gas Auditor Trainee (T)
- Experts (E)

It is required that the sectoral scope/s and the technical area/s linked to the methodology and project have to be covered by the assessment team.

Name	**Qualification**	**Coverage of scope**	**Coverage of technical area**	**Host country experience**

Johann Thaler	**ATL**	**þ**	**þ**	**þ**

Johann Thaler graduated as Master of environmental Economy at the University of Augsburg. During his study he got first experiences in environmental management systems. His master thesis was about a fuel switch program in Brazil as a CDM project. Based in Brazil he has been working for TÜV SÜD as a GHG auditor on freelance basis since March 2005.

2.2 Review of Documents

The first version of the PDD was submitted to the DOE in May 2009. The first PDD version submitted by the PP and additional background documents related to the project design and baseline have been reviewed to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources has been done as an initial step of the validation process. A complete list of all documents and evidence material reviewed is attached as annex 2 to this report.

2.3 Follow-up Interviews

During 02/07/2009-04/07/2009 and in December 2009, TÜV SÜD performed interviews, telephone conferences, and physical site inspections with project stakeholders to confirm relevant information, and to resolve issues identified in the first document review. The table below provides a list of all persons interviewed in this process.

Name	Organisation
Ansberto R. do Passo Neto, Chemical Engineer	Cooperativa Agroindustrial LAR (in the following called just "LAR")
James Morais Environmental Technologist	Cooperativa Agroindustrial LAR
Javier Becerra Sanchez, Carbon Implementation Manager	Zeroemissions do Brasil
Ana Carnal Andres-Montalvo, Carbon Implementation Manager	Zero Emissions Technologies SA
Ferran Tejada Valero, Carbon Implementation Manager	Zeroemissions do Brasil
Eduardo Ferreira, Project Developer	Zeroemissions do Brasil
Saulo de Tarso Granemann Lucena, Technician in agricultural and industrial licensing	IAP (Paraná Environmental Institute)

2.4 Further cross-check

During the validation process the team has made reference to available information related to similar projects or technologies as the CDM project activity. Project documentation has also been reviewed against the approved methodologies applied to confirm the appropriateness of formulae and correctness of calculations.

2.5 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve the requests for corrective actions, clarifications, and any other outstanding issues which needed to be clarified for TÜV SÜD`s conclusion on

the project design. The CARs and CRs raised by TÜV SÜD were resolved during communication between the client and TÜV SÜD. To guarantee the transparency of the validation process, the concerns raised and responses that have been given are documented in more detail in the validation protocol in annex 1.

The final PDD version submitted in February 2010 serves as the basis for the final assessment presented. Further changes to the project during the validation process are not considered to be significant with respect to the main CDM objectives. The two CDM main objectives are the reduction of anthropogenic GHG emissions and the contribution to the host country sustainable development.

2.6 Internal Quality Control

Internal quality control is the final step of the validation process and involves the internal quality control by the CB "climate and energy" of the final documentation, which includes the validation report and annexes. The completion of the quality control indicates that each report submitted has been approved either by the head of the CB or the deputy (a veto person can be used if necessary). In projects where either the Head of the CB or his/her deputy is part of the assessment team, the approval is given by the one not serving on the project.

After confirmation by the PP, the validation opinion and relevant documents are submitted to the EB through the UNFCCC web-platform.

3 SUMMARY

The assessment work and the main results are described below in accordance with the VVM reporting requirements. The reference documents indicated in this section and annex 1 are stated in annex 2.

3.1 Approval

The project participants are Cooperativa Agroindustrial Lar and Zeroemissions do Brasil Ltda. from Brazil (Host Party) and Zero Emissions Technologies SA from Spain. The participation of all three project participants was confirmed during the on-site interview. The Host Party Brazil and further participating party Netherlands[1] meet the requirements to participate in the CDM.

The DNA of the Netherlands issued a LoA (IRL 118) on 29 April 2010 authorizing Zero Emissions Technologies SA as a project participant. TÜV SÜD received this letter from the project participant directly and considers the provided letter as authentic. Furthermore, after checking the provided LoA, TÜV SÜD confirms that the letter refers to the precise proposed CDM project activity title in line with the title in the PDD "Cooperativa Lar Wastewater Treatment and Energy Generation Project".

The letter also indicates that Netherlands is a Party to the Kyoto Protocol, and that the participation in the "Cooperativa Lar Wastewater Treatment and Energy Generation Project project" is voluntary. Based on the information given in this letter, TÜV SÜD considers the approval as unconditional with respect to these items.

The LoA does not refer to a specific version of the PDD or validation report.

The LoA has been issued by the respective Party's DNA from the Netherlands: Ministry of Housing, Spatial Planning and the Environment (VROM).

The final letter of approval of the Host Country has not been received yet, but a request for registration will not be submitted as long as the Host Country letter of approval have not been received according to § 50 (a) of the VVM.

Before submitting the project for registration, TÜV SÜD will check whether the requirements of the VVM (§§ 45-48) are complied with.

3.2 Participation

See chapter 3.1.

3.3 Project design document

The PDD is compliant with relevant form and guidance as provided by UNFCCC.

The most recent version of the PDD form was used.

TÜV SÜD considers that the guidelines for the completion of the PDD in their most recent version have been followed. Relevant information was provided by the participants in the applicable PDD sections. Completeness was assessed through the protocol included in annex 1 of this report.

3.4 Project description

The following description of the project as per PDD was verified during the on-site audit:

The proposed project activity will modify the current wastewater treatment management system in two stages. The first stage (with a wastewater flow of 150 m3/h) consists of partially recovering the

[1] The annex I country Netherlands (instead of Spain mentioned in the GSP PDD) finally issued the LoA for Zero Emissions Technologies S.A.

biogas generated during the anaerobic treatment with the aim of generating electricity from biogas. The second stage (when there is increased wastewater flow, namely up to 350 m3/h) aims on the one hand to avoid methane emissions by replacing anaerobic by aerated treatments and on the other hand to recover biogas for electricity generation. 80 m3/h will enter the bio-digesters and will after digestion be re-circulated to meet the remaining flow of 270 m3/h plus 10 m3/h from re-circulated sludge from the end of the treatment in the homogenization tank. From there, 360 m3/h will be directed to the physical-chemical flotation tank (PCF tank) and further on to the aerated lagoon system. Thus, the project activity will reduce GHG emissions from three sources: 1) Avoidance of methane emissions from the existing open anaerobic lagoons by the installation of a biogas recovery system, 2) Avoidance of methane emissions through the replacement of anaerobic systems by aerated treatments and 3) the displacement of electricity from the grid generated by fossil fuel fired power plants. The project activity contributes to regional and national sustainable development as described in Annex 1, A.2.1. by creating environmental, social and economic benefits.

Although the project registration is expected to happen together with the implementation of stage 2, the PPs and validation team have it considered as convenient to include the explanation in the PDD and validation report respectively of how would the first stage of implementation be considered in accordance with the applicable methodologies, taking into account that the whole project activity has been configured to start reducing GHG emissions from the first stage of implementation. Hence, both stages of implementation are explained, despite the fact that calculations of emissions reductions only consider the second stage, which is the configuration that would actually be operating when the project gets the registration status.

The information presented in the PDD on the technical design is consistent with the actual planning and implementation of the project activity as confirmed by:

- The review and cross check of data and information (see annex 2).
- An on-site visit which has been performed. Relevant stakeholder and personnel with knowledge of the project were interviewed.
- Information related to similar projects or technologies which have been used to validate the accuracy and completeness of the project description.

In conclusion, TÜV SÜD confirms that the project description, as included in the PDD, is sufficiently accurate and complete in order to comply with the requirements of the CDM.

3.5 Baseline and monitoring methodology

3.5.1 Applicability of the selected methodology

Compliance with each applicability condition as listed in the chosen baseline and monitoring methodologies AMS III.H, version 13 / AMS III.I, version 08 / AMS-I.D, Version 15 has been demonstrated.

The assessment was carried out for each applicability criteria and included, among other checks, the compliance check of the local project setting with the applicability conditions in regard to baseline setting and eligible project measures. This assessment also included the review of secondary sources, which further demonstrate that applicability conditions have been complied with.

The methodology specific protocol, included in the annex 1, documents the assessment process. The protocol also includes the steps taken in the assessment process. The results of the compliance check as well as relevant evidence are detailed in annex 1. It should be emphasized that the

applicability of AMS.III.I is limited to some treatment systems in the project scenario. Unlike AMS.III.H, the SSC methodology AMS.III.I does not consider the recovery of methane and its combustion in the treatment facilities. However, the systems affected by AMS.III.I do not recover methane nor combust it. Methane recovery only takes place in the existing first and second open anaerobic lagoons, which are covered by the biodigesters. These lagoons are covered under AMS.III.H in the project scenario. Apart from this, methane combustion takes place in the engines installed for this purpose. Electricity generation by these engines is covered under AMS.I.D as per the procedures described in AMS.III.H.

TÜV SÜD confirms that the chosen baseline and monitoring methodology is applicable to the project activity.

Emission sources, which are not addressed by the applied methodology, and which are expected to contribute more than 1% of the overall expected average annual emission reductions, have not been identified.

3.5.2 Project boundary

The project boundary was assessed considering information gathered from the physical site inspection, interviews, and secondary evidence received on the design of the project.

- The affected systems by the project activity have been identified and assessed as per paragraph 14 of AMS III.H, version 13 and are in both implementation stages:

1) The first and second existing anaerobic lagoons, which in the baseline scenario are open lagoons. In the project scenario, these lagoons are covered and lined and biogas is recovered to be combusted in the biogas engines and/or flared in the safety torch.
   Paragraph 14 of the methodology mentions that *"the treatment systems (lagoons, reactors, digesters, etc.) that will be covered and/or equipped with biogas recovery by the project activity, but continue to operate with the same qty. of feed inflow, volume (retention time), and temperature (heating) as in the baseline scenario, may be considered as not affected i.e., the methane generation potential remains unaltered"*. The existing anaerobic lagoons in the baseline scenario, operate in the first stage of implementation with the same flow, the same volume (retention time) and temperature (since there is no heating in the project). However, agitation systems are introduced in the biodigesters. These agitation systems, in the baseline scenario, would interfere the anaerobic conditions in the baseline situation (open lagoons) and would affect the treatment conditions. In the project situation, where lagoons are lined and covered, agitation systems avoid the formation of grease layers in the water. These layers, which appear in the baseline situation, would be inconvenient in the project scenario, in which the aim of the PPs is to recover all the biogas generated. Hence, in fact, the treatment conditions and the equipment installed in the project scenario affect the treatment systems (existing anaerobic open lagoons) and, thus, these are affected by the project activity. In the 2nd implementation stage, the quantity of inflow will be less compared to the baseline scenario, as only 80m3/h out of the whole water flow passes through the biodigester.
2) The biogas engines, in which biogas recovered is combusted for electricity generation.

The validation team deems the affected systems as per paragraph 14 of AMS III.H, version 13 to be appropriate.

- As per AMS.III-H/Version 13, for the methane capture part of the project, "the project boundary is the physical, geographical site where the wastewater and sludge treatment takes place in baseline and project situation. It covers all facilities affected by the project activity including sites where the processing, transportation and application or disposal of waste products as well as biogas takes place."
- As per AMS.III-I/Version 08, for methane production avoidance, "the project boundary is the physical, geographical sites where:
  - The wastewater treatment would have taken place and the methane emission occurred in the absence of the project activity;
  - The wastewater treatment takes place in the project activity;
  - The sludge is treated and disposed off in the baseline and project situation"
- As per AMS.I-D/Version 15, for the electricity generation part of the project activity, "the physical, geographical site of the renewable generation source delineates the project boundary.

Regarding the first stage of the project, the project boundary includes the new equipments like biodigesters and engines, project lagoons (aerated lagoons and facultative lagoons), baseline lagoons. As the PPs only claim CERs from the destruction of methane in the biogas engines and not from the destruction in the flares, the flaring system is not included in the project boundary. Nevertheless, the biogas is flared in the safety torch, in case it is not combusted in the engines. In the baseline as well as in the proposed project activity, there has not been and will not be any sludge treatment in the wastewater treatment plant. In the baseline scenario, only sizeable solids from the slaughterhouse have been separated from the wastewater flow before arriving the flotation tank, situated prior to the anaerobic lagoons. This will be maintained in the project scenario, i.e. sizeable solids pass through a coarse screening process before wastewater enters the flotation tank and subsequently the biodigesters.

Regarding the second stage of the project, the project boundary includes the new equipments like biodigesters, physical-chemical flotation (PCF) tank, decanter and engines, project lagoons (aerated lagoons), baseline lagoons. As the PPs only claim CERs from the destruction of methane in the biogas engines and not from the destruction in the flares, the flaring system is not included in the project boundary. Nevertheless, the biogas is flared in the safety torch, in case it is not combusted in the engines. In the second stage of the project implementation, there is a separated treatment for solid matter from the PCF tank. This treatment is not a sludge treatment since it is a physical separation, without settling processes or biological activity. Chicken parts, feathers and other sizeable solids are removed from water inflow before entering the wastewater treatment. This separation is also done in the baseline situation: sizeable solids from the slaughterhouse are separated from the wastewater flow at the flotation tank, before entering the anaerobic lagoons. This removal of solids however is not to be considered as sludge, as there was no sedimentation process before.

Relevant documentation assessed to confirm the project boundary are listed below:

- Environmental Control Plans from April 2003 (IRL 9) and March 2009 (IRL 7)
- Power Purchase Agreement with COPEL (IRL 10)
- Grid connection approval (IRL 11)
- Public tendering for biodigester project study (IRL 27)

Details and/or observations, are listed in annex 1 and annex 2.

Therefore, TÜV SÜD confirms that the identified boundary, the selected sources, and gases as documented in the PDD are justified for the project activity and are fully in line with the requirements set by the applied methodology.

3.5.3 Baseline identification

The PDD defines the following baseline scenario:

Continuation of the wastewater treatment based in anaerobic open lagoons and subsequent aerated, facultative and polishing lagoons as well as the construction of new open anaerobic lagoons and facultative and polishing lagoons in the nearby zone in order to receive the increased wastewater flow and in order to maintain the minimum retention time required for removing the same COD amount as in the current situation. In the baseline situation, no electricity would be generated from renewable sources since no biogas would be recovered. Electricity required for the operation of the plant, would be purchased from the grid, as before, which is in accordance with AMS.ID.

The land in the nearby zone to the industrial plant belongs to Cooperativa Lar. Thus, there is enough space to open new anaerobic lagoons. This was verified during the on-site visit by visual inspection and official land registry (IRL 24). The baseline scenario is in compliance with the applied methodologies and with the Brazilian legislation**.** Besides, there is no obligation by the Brazilian federal or state legislation to change the wastewater treatment from anaerobic to aerated nor to recover the generated biogas during anaerobic degradation of wastewater nor to use that biogas as an energy source for electricity generation. This has been verified by the validation team by checking the sources mentioned in footnote 9 of the PDD as well as through an interview with the technician in agricultural and industrial licensing of Paraná Environmental Institute IAP (IRL 2).

According to paragraph 16 of the "Indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories" version 12.1 (EB50), ***"Capacity increase:*** *Type II and III project activities involving capacity increase may use a Type II and Type III SSC*

methodology provided that they can demonstrate that the most plausible baseline scenario for the additional (incremental) capacity is the baseline provided in the respective Type II and III small-scale methodology. The demonstration should include the assessment of the alternatives of the project activity. For the purpose of the demonstration, project participants may apply the Steps 1 to 3 of the latest version of "Combined tool to identify the baseline scenario and demonstrate additionality" to identify the baseline scenario. If the identified baseline scenario for the additional (incremental) capacity is the same as the baseline of the methodology, and it can be demonstrated that the implementation of the project as 'the proposed project activity undertaken without being registered as CDM', is not the common practice in the region, project participants can apply the respective methodology. If the most plausible scenario for the additional capacity is the project activity, the baseline emissions are considered only to the extent of the capacity of the facility, which is being replaced".

Under Step 1, besides the alternative "Continuation of the wastewater treatment based in anaerobic open lagoons and subsequent aerated, facultative and polishing lagoons as well as the construction of new open anaerobic lagoons and facultative and polishing lagoons in the nearby zone in order to receive the increased wastewater flow and in order to maintain the minimum retention time required for removing the same COD amount and electricity required for the operation of the plant, would be purchased from the grid" which has been finally determined as the baseline scenario and "the project activity undertaken without being registered as a CDM project" two other potential alternatives, namely the "continuation with the existing treatment without making any modification" and the "Installation of aeration equipment in the existing anaerobic lagoons" have been contemplated. The alternatives presented do include all plausible scenarios taking into account the local and sectoral situations for the mentioned outputs. The list of alternatives is therefore considered complete. The alternative "continuation with the existing treatment without making any modification" is neither realistic nor in compliance with the law, as the organic load of the increased wastewater flow would not be properly removed due to a too short retention time and wastewater would be discharged with very high COD, Suspended Solids (SS) and Biological Oxygen Demand (5 days) (BOD_5), which would be not within the permitted values of the Brazilian legislation. The alternative "Installation of aeration equipment in the existing anaerobic lagoons" would make it necessary to install a micro bubble diffuser system as the low retention time requires a high efficiency aeration, which is only reached through micro bubble aeration from the bottom of the tank. Such a micro bubble diffuser system requires much higher investment and O&M costs than a treatment system based on anaerobic open lagoons, consists of a quite complex operation and maintenance structure and would cause power consumption by blowers which are connected to micro bubble diffusers. Thus, there is no reason for LAR to invest into an alternative with high operational uncertainties and which is economically less attractive than the continuation of the wastewater treatment based in anaerobic open lagoons with the appropriate expansion to treat the increased flow. The alternative "project activity undertaken without being registered as a CDM project" is not realistic due to the existence of investment and prevailing practice barriers (step 2 of the Combined Tool) as further explained in chapter 3.6.. It is clearly shown that the identified baseline scenario for the additional (incremental) capacity is the same as the baseline mentioned in one of the applied methodologies AMS III.I. (the other applied methodologies AMS III.H and AMS I.D do not explicitly mention a certain baseline scenario for the given project activity). Step 3 of the Combined Tool is not applied by the PPs, once additionality is already shown by using Step 2 (barrier analysis). The validation team can confirm that the implementation of the project as 'the proposed project activity undertaken without being registered as CDM', is not the common practice in the region. Declarations of both AVESUY (the supplier of the biodigester system) (IRL 115) and Gratt Industria de Maquinas Ltda, an experienced technological provider for aeration equipment for water treatment (IRL 114) confirmed that anaerobic open lagoon systems are the common practice in poultry slaughterhouses in the State of Parana. This was cross-checked by consulting IAP (Paraná Environmental Institute) and confirmed by an Email received on 09/01/2010 from the Technician in agricultural and industrial licensing (IRL 116).

According to the described documents and the sectoral and local expertise of the validation team, the DOE confirms that the 'the proposed project activity undertaken without being registered as CDM', is not the common practice in the region and thus the given methodology can be applied as per paragraph 16 of the "Indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories", version 12.1 (EB50).

The information presented in the PDD has been validated by an initial document review of all data. Further confirmation has been made based on the on-site visit and researched information from similar projects and/or technologies. The sources referenced in the PDD have been quoted correctly. The information was verified against credible sources, such as:

- Environmental Control Plan from 04/2003 (IRL 9) mentioning the existence of anaerobic and aerobic lagoons inclusive a map of the open lagoon system
- Public tendering for biodigester project study (IRL 27): Pages 14 and 15 clearly mention the existence of anaerobic lagoons in the baseline scenario
- Photos of the anaerobic lagoons in the baseline scenario and its cleaning process (IRL 30)
- Calculation of lagoon volume needed for increased wastewater flow (IRL 48)
- Declaration of Gratt Industria de Maquinas Ltda and AVESUY (IRL 114 and 115) and Email sent from Technician in agricultural and industrial licensing IAP (Paraná Environmental Institute) (IRL 116) about common practice for wastewater treatment of poultry slaughterhouses in Parana State.

TÜV SÜD has determined that no reasonable alternative scenario has been excluded.

Based on the validated assumptions used for project activity calculations, TÜV SÜD considers that the identified baseline scenario is reasonable.

Taking the definition of the baseline scenario into account, TÜV SÜD confirms that all relevant CDM requirements, including relevant and/or sectoral policies and circumstances, have been identified correctly in the project PDD.

A verifiable description of the baseline scenario has been included in the PDD.

In regard to item 86 of VVM, TÜV SÜD confirms that:

1. All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
2. All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
3. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence, and can be deemed reasonable;
4. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
5. The approved baseline methodologies have been correctly applied to identify the most reasonable baseline scenario, and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

3.5.4 Algorithm and/or formulae used to determine emission reductions

TÜV SÜD has assessed the calculations of project emissions, baseline emissions and emission reductions. Leakage effects are not to be considered according to the applied methodologies. Corresponding calculations were carried out based on calculation spreadsheets (IRL 36,102). The parameters and equations presented in the PDD, as well as other applicable documents, have been com-

pared with the information and requirements presented in the methodology and respective tools like Tool to calculate the emission factor for an electricity system, version 2. The equation comparison has been made explicitly following all the formulae presented in the calculation files.

The assumptions and data used to determine the emission reductions are listed in the PDD and all the sources have been checked and confirmed.
Based on the information reviewed it can be confirmed that the sources used are correctly quoted and interpreted in the PDD.
The values presented in the PDD are considered reasonable based on the documentation and references reviewed and the results of the interviews.
The baseline methodologies have been correctly applied according to the requirements.
The estimate of the baseline emissions can be confirmed as the same baseline emissions results have been replicated by the audit team using the information provided.
Detailed information on the verification of the parameters used in the equations can be found in annex 1. The algorithms for the determination of the baseline and project emissions are discussed in the following sections.

At the moment of validation, the project activity was being implemented as per the schedule shown in the PDD. It is expected that the project will get the registered status once the second stage of implementation will have be completed (October, 2010). Hence, emission reduction calculation related to the first stage of the implementation have been excluded from the PDD, although the explanation of the systems affected by the project activity is extensive to both stages of implementation.

3.5.4.1 Baseline Emissions

The calculation of the baseline emissions were conducted according to the procedures described in the methodologies AMS-III.H, version 13 / AMS-III.I, version 08 / AMS-I.D., version 15.

The COD values in the baseline and the removal efficiency of each baseline equipment have been estimated by considering the historical records of COD measurements (IRL 32) at Cooperativa Lar wastewater treatment with data from January 2007 up to November 2008, i.e. 18 months prior to project´s starting date and 5 months after the project´s starting date, thus in total 23 months.

Baseline emissions according to AMS-III.H are related to the methane emissions from the current wastewater treatment systems which will be equipped with methane recovery systems in the project scenario. According to the Small Scale CDM Simplified Baseline and Monitoring Methodology AMS.III.H, baseline emissions for the systems affected by the project activity may consist of the following:

$$BE_y = (BE_{y,\ power} + BE_{ww,y,\ treatment} + BE_{s,y,treatment} + BE_{ww,discharge,y} + BE_{s,\ final,y}),$$ whereas

BE $_{y,\ power}$ *: Baseline emissions from electricity or fuel consumption in year y*

BE $_{ww,y,treatment}$ *: Baseline emissions of the wastewater treatment systems affected by the project activity in the year y*

BE $_{s,y,treatment}$ *: Baseline emissions of the sludge treatment systems affected by the project activity in the year y*

BE $_{ww,discharge,y}$ *: Baseline methane emissions from degradable organic carbon in treated wastewater discharged into sea/river/lake in year y*

BE $_{s,\ final,y}$ *: Baseline methane emissions from anaerobic decay of the final sludge produced in year y*

*Baseline emissions from electricity consumption (****BE*** $_{y,power}$*) are determined as per the procedures described in AMS-I.D. T*he emission factor for the estimate of CERs is the one available at com-

mencement of validation, namely 0.1842 tCO2/MWh. The grid emission factor was calculated by the Brazilian DNA (available at: http://www.mct.gov.br/index.php/content/view/307492.html), using the Dispatch Data Analysis for the Operating Margin. The Build Margin emission factor was determined using the generation-weighted average emission factor of all power units during the most recent year for which power generation data was available. Therefore, the emission factor of 0.1842 tCO2/MWh was accepted just for estimating the expected emission reductions of the project activity during the crediting period. Hence, the emission factor calculation used in this PDD, for estimating purposes only, must be verified and updated accordingly using the most recent data available at the time of the verification process.

*Baseline emissions of the wastewater treatment systems affected by the project activity in the year y (**$BE_{ww,y,treatment}$**)* are determined using the methane generation potential of the treatment systems. Since the baseline treatment to which AMS-III.H is applicable, consists of anaerobic open lagoons deeper than 2 m, the MCF is the one corresponding to an anaerobic deep lagoon with depth of more than 2 meters, thus MCF=0.8. In both stages, $COD_{removed}$ is calculated as the difference between average COD_{outlet} (flotation tank)=COD_{inlet} (anaerobic lagoon 1) and COD_{outlet} (anaerobic lagoon 2)=COD_{inlet} (anaerobic lagoon 3). The volume of wastewater treated in the baseline wastewater treatment system consists of 150 m3/h in stage 1 and is limited to 80 m3/h in stage 2 for the system affected by AMS.III.H.

*Baseline emissions of the sludge treatment systems by the project activity in the year y (**$BE_{s,y,treatment}$**) and Baseline methane emissions from anaerobic decay of the final sludge produced in the year y (**$BE_{s,final,y}$**)* are not accounted for and are thus zero, as in the baseline scenario the sludge generated in the wastewater treatment is not separated from treated wastewater, arrives in the polishing lagoon and is used for fertiirrigation. The use of sludge together with treated water for fertiirrigation does not lead to GHG emissions since there is no anaerobic decomposition of sludge.

Regarding *methane emissions from degradable organic carbon in treated wastewater discharged in e.g. a river, sea or lake in the baseline situation in the year y (**$BE_{ww,discharge,y}$**),* the discharge happens in open anaerobic lagoons deeper than 2 meters, the MCF for discharge is equal to 0.8. Both in stage 1 and stage 2, the discharge of wastewater affected by the biogas recovery and thus AMS III.H is done on the 3rd anaerobic lagoon. The volume of wastewater treated in the baseline wastewater treatment system consists of 150 m3/h in stage 1 and is limited to 80 m3/h in stage 2.

Baseline emissions according to **AMS-III.I** are related to the current wastewater treatment systems and consist of the followings:

$$BE_y = (BE_{ww,y,treatment} + BE_{s,y,treatment} + BE_{ww,discharge,y} + BE_{s,final,y})$$, **whereas**

***$BE_{ww,y,treatment}$** : Methane produced in the anaerobic baseline wastewater treatment system that is being replaced with the biological aerated system*

***$BE_{s,y,treatment}$** : Methane produced in the baseline sludge treatment system*

***$BE_{ww,discharge,y}$** : Methane emissions on account of inefficiencies in the baseline wastewater treatment systems and presence of degradable organic carbon in the treated wastewater discharged into the river, sea or lake.*

***$BE_{s,final,y}$** : Baseline methane emissions from anaerobic decay of the final sludge produced*

Regarding *Baseline emissions of the wastewater treatment systems affected by the project activity in the year y (**$BE_{ww,y,treatment}$**)*, **the wastewater flow and COD inflow and outflow will be** measured in each anaerobic treatment replaced in the project scenario by an aerated system. In stage 1, the 3rd existing anaerobic lagoon with a depth of over 2m is modified to an aerated lagoon, thus an MCF of 0.8 is applied and $COD_{removed}$ is calculated by the difference of COD_{outlet} (anaerobic lagoon 2)=COD_{inlet} (anaerobic lagoon 3) and COD_{outlet} (anaerobic lagoon 3)=COD_{inlet} (existing aerated lagoon, poorly managed). Besides, the existing aerated lagoon poorly managed is modified to an

aerated lagoon well managed, thus an MCF of 0.3 is applied and COD removed is calculated by the difference of COD_{outlet} (anaerobic lagoon 3)= COD_{inlet} (existing aerated lagoon, poorly managed) and COD_{outlet} (existing aerated lagoon, poorly managed)=COD_{inlet} (existing facultative lagoon 1). In stage 2, the wastewater flow not passing through the biodigester (maximum of 270 m3/h) is separately considered from the flow which passes through the biodigester (80 m3/h). In the baseline situation, the wastewater would have been treated in 3 existing serial anaerobic lagoons, in an aerated lagoon poorly managed and in facultative lagoons. In the proposed project activity, the wastewater will be treated in a new aeration system which includes a physical chemical flotation tank, 3 aerated lagoons operating serial and a secondary decanter. An MCF of 0.8 is applied regarding the anaerobic open lagoons and $COD_{removed}$ is calculated as difference between the COD_{outlet} (flotation tank)=COD_{inlet} (anaerobic lagoon 1) and COD_{outlet} (anaerobic lagoon 3)=COD_{inlet} (existing aerated lagoon, poorly managed). A MCF of 0.3 is applied for the modification of the aerated lagoon poorly managed to an aerated lagoon well managed and CODremoved is calculated as difference between the COD_{outlet} (anaerobic lagoon 3)=COD_{inlet} (existing aerated lagoon, poorly managed) and COD_{outlet} (existing aerated lagoon, poorly managed)=COD_{inlet} (existing facultative lagoon 1). A MCF of 0.8 is applied for the modification of the 1st existing facultative lagoon into an aerated lagoon well managed and $COD_{removed}$ is calculated as difference between COD_{outlet} (existing aerated lagoon, poorly managed)=COD_{inlet} (existing facultative lagoon 1) and COD_{outlet} (existing facultative lagoon 1)= COD_{inlet} (existing facultative lagoon 2).

*Baseline emissions of the sludge treatment systems by the project activity in the year y (**$BE_{s,y,treatment}$**)* and *baseline methane emissions from anaerobic decay of the final sludge produced in the year y (**$BE_{s,\ final,y}$**)* are not accounted for and are thus zero as in the baseline scenario the sludge generated in the wastewater treatment is not separated from treated wastewater, arrives in the polishing lagoon and is used for fertiirrigation. The use of sludge together with treated water for fertiirrigation does not lead to GHG emissions since it is deactivated, i.e. the organic matter does not suffer further decomposition.

*Methane emissions on account of inefficiencies in the baseline wastewater treatment systems and presence of degradable organic carbon in the treated wastewater discharged into the river, sea or lake (**$BE_{ww,discharge,y}$**)* are accounted for in stage 1 with an MCF of 0.8, as the discharge is done in the 1st existing facultative lagoon. As $COD_{discharge}$ is used the COD_{outlet} of the existing aerated lagoon, poorly managed. In stage 2, wastewater treated in the systems affected by the project activity would (in the baseline situation) be discharged in the 2nd existing facultative lagoon with a depth of more than 2m. Thus a MCF of 0.8 is applied and as CODdischarge is used the CODoutlet of the 1st existing facultative lagoon.

As per the methodologies, the project does not need to consider leakage. *As a result, the annual emission reductions equal the annual baseline emissions minus project emissions*.

3.5.5 Project emissions

1. **According to AMS-III.H, project activity emissions from the systems affected by the project activity are the followings:**

(i) CO2 emissions on account of power and fuel use by the project activity facilities

è See item (3) AMS-I.D

(ii) Methane emissions from wastewater treatment systems affected by the project activity and not equipped with biogas recovery in the project situation

è During the 1st stage of the project implementation, the wastewater treatment system without biogas recovery is only the newly established well managed aerated lagoon after the bio-digesters, thus MCF is zero (as per AMS III.H.) and subsequently project

emissions from this item are zero. During the 2nd stage of the project implementation, there is no anaerobic system which could emit methane without biogas recovery system. Thus, project emissions from this item are zero.

(iii) Methane emissions from sludge treatment systems affected by the project activity and not equipped with biogas recovery in the project situation

- **è** Since sludge treatments are not affected by the proposed project activity, baseline and project emissions from sludge treatment are equal to zero and, hence, not considered in the calculations.

(iv) Methane emissions on account of inefficiency of the project activity wastewater treatment system and presence of degradable organic carbon in treated wastewater

- **è** In the 1st stage of the project activity, wastewater outlfow from the digesters is discharged on the former 3rd anaerobic open lagoon, which is modified into an aerated lagoon and in the 2nd stage the treated wastewater is discharged in the new aerated treatment system. In both cases MCF is equal to zero as per AMS III.H and thus as well project emissions from this item are zero.

(v) Methane emissions from the decay of the final sludge generated by the project activity treatment systems

- **è** Since the decay of final sludge is not affected by the implementation of the proposed project activity, emissions due to the decay of the final sludge are not considered.

(vi) Methane fugitive emissions on account of inefficiencies in capture systems

- **è** In stage 1, the only system with biogas recovery in the project scenario are the bio-digesters and project emissions on account of inefficiencies of the bio-digesters are considered respectively. The COD removed is based on a removal efficiency of the biodigesters of 70% as per IRL 7. In stage 2, the only system with biogas recovery remain the biodigesters and the COD removal is the same as in the first stage. However, water flow in biodigesters in stage 2 is only 80 m3/h (instead of 150 m3/h in the first stage).

(vii) Methane emissions due to incomplete flaring

- **è** Methane emissions due to incomplete flaring should be monitored as per the "Tool to determine project emissions from flaring gases containing methane", version 1, however PPs decided to exclude the flare from the project boundary, thus neither baseline nor project emissions due to biogas flared in the open flare are accounted for. Flaring parameters as per the "Tool to determine project emissions from flaring gases containing methane" are not monitored neither.

(viii) Methane emissions from biomass stored under anaerobic conditions which does not take place in the baseline situation

- **è** There is no storage of biomass in the proposed project activity. Hence, these emissions are not accounted for.

(ix) Project emissions related to the upgrading and compression of biogas

- **è** The proposed project activity does not involve the upgrade and compression of biogas. Hence, these emissions are not considered.

2. According to AMS-III.I, project activity emissions consist of:

(i) CO_2 emissions related to the power and fossil fuel used by the project activity facilities

- **è** See AMS-I.D

(ii) Methane emissions during the treatment of the wastewater in biological aerated wastewater treatment systems

- **è** In stage 1, the affected systems are the newly established well managed aerated lagoon (former 3rd anaerobic lagoon) and the existing aerated lagoons formerly poorly managed which is re-equipped to a well managed aerated lagoon. As per AMS-III.I, the MCF in such a situation is zero and thus as well project emissions for this item are zero. In stage 2, the affected systems are the physical chemical flotation tank and the new aerated lagoons which are well managed. As per AMS-III.I, the MCF in such a situation is zero and thus as well project emissions for this item are zero.

(iii) Methane emissions from degradable organic carbon in treated wastewater discharged in sea/river or lake

- **è** In stage 1, wastewater from the new aerated well managed lagoon is discharged into the existing 1st facultative lagoon with a depth of more than 2 meters. As per AMS III.I, the MCF in such a case is 0.8. The $COD_{discharge}$ is based on a removal efficiency of the biodigesters of 70% and the 2 aerated lagoons of each 30% according to the Environmental Control Plan (IRL 7). In stage 2, the wastewater from the aerated system is discharged in the new secondary decanter. The $COD_{discharge}$ is based on a 90% removal efficiency of the physical-chemical flotation tank as well as 86% removal efficiency of the aeration system. These removal efficiencies are according to the Environmental Control Plan (IRL 7) and thus the calculated $COD_{discharge}$ of 48 mg/l applied in the ex-ante CER calculation can be accepted. The exact $COD_{discharge}$ value will be determined ex-post by monitoring the same. The whole wastewater inflow of 350 m3/h is considered in order to be conservative. An MCF of 0.8 is chosen, as the decanter is deeper than 2 meters.

(iv) Methane emissions from sludge treatment in the project activity

- **è** Since the project activity does not involve the modification of a sludge treatment from the baseline, these project emissions are not considered.

(v) Methane emissions from the decay of final sludge generated by the project activity, if sludge is disposed to decay Anaerobically in a landfill without methane recovery

- **è** Since the project activity does not involve the modification of a sludge treatment from the baseline, these project emissions are not considered

3. According to AMS I.D project emissions consist of:

- **è** Electricity is consumed by the project activity equipment. Emissions due to this power consumption are considered in the emission reduction calculation. A specific electricity meter measuring the electricity consumption of the installed project equipment will not be installed. It is assumed that all relevant electrical equipment will operate at full rated capacity for 8760 hours per year. 10% for distribution losses are accounted for.

3.5.6 Leakage

Not applicable, as there are no leakage emissions. No aerobic treatment equipment is transferred from another activity or existing equipment transferred to another activity. The only thing what happens is that some aeration equipment is transferred within LAR facility from the previous treatment system (baseline scenario) to the new one. However, PPs have considered them as project activity equipment and the emissions due to power consumption have been accounted for as project emissions.

3.5.7 Emission Reductions

In summary, the calculation of the baseline emissions, project emissions and the emission reductions, respectively, can be considered correct.

3.6 Additionality

The additionality of the project has been presented in the PDD using Appendix B of the Simplified Modalities and Procedures for CDM Small Scale Project Activities.

The approach used in the PDD has been assessed initially through the document review, during which the following documents were reviewed:

-Sustainability Report. Itaipú 2006 (IRL 48)

-Weblinks regarding barrier analysis mentioned in B.5. of the GSP PDD

On site, the additionality was discussed principally with: Ansberto R. do Passo Neto, Chemical Engineer, Cooperativa Agroindustrial LAR, Javier Becerra Sanchez, Carbon Implementation Manager, Zeroemissions do Brasil and Ana Carnal Andres-Montalvo, Carbon Implementation Manager, Zero Emissions Technologies SA.

Further documents have been reviewed on-site (annex 2).

Finally, the data, rationales, assumptions, justifications, and documentation provided have been verified using local knowledge as well as sectoral and financial expertise. This information was also confirmed through the following documentation:

- Investment comparison table (IRL 57)
- Budget for lagoons excavation (Orçamento de execuçao) (IRL 55 and 64)
- Calculation of lagoon volume needed for increased flow (IRL 48)
- Email from Cooperativa Lar to Zeroemissions do Brasil regarding the lagoons' size in the process and the lagoons' configuration (IRL 49 and 50)
- Invoices for diffusers in aeration lagoon (IRL 51), for anaerobic lagoons adaptation and cleaning (IRL 53), for excavation works (IRL 59), for gas analyzer (IRL 60), for PVC pipeline (IRL 61), for electricity generation set 2 x 50 kVA (IRL 62), for biogas pipeline execution and biogas generators warehouse (IRL 65), for adaptation of electrical facilities (IRL 110), for centrifugal pump (IRL 111).
- Fund allocation from FINEP (IRL 52)
- Budget for implementation of the second stage of the project (IRL 56)
- Monthly electricity invoices from September 2008 until August 2009 (IRL 54)
- Power purchase agreement between COPEL and LAR (IRL 10)

Based on these validation steps we can confirm that the documentation assessed is appropriate for this project.

3.6.1 Prior consideration of the clean development mechanism

The starting date of the project activity is determined by the starting date of the land preparation works for constructing the biodigesters on June 20, 2008. This is the first action which is related with significant financial commitments. In order to corroborate this information, the assessment team has reviewed the following documents: First invoice for ground preparation work at the 1st anaerobic lagoon for the biodigester, dated 20/06/2008 (IRL 16), Purchase agreement for biodigesters between ITAI (executive organ FINEP) and AVESUY dated 15/01/2009 (IRL 15), anaerobic lagoons covering process starting in February 2009 (IRL 63), Purchase agreement for 2 generators between ITAI and BIOGAS Motores Estacionarios Ltda. (IRL 17) dated 02/03/2009, Contract between ITAI and C R Razente Construcoes Ltda. for civil construction of the power house, dated 29/04/2009 (IRL 34), additionally the assessment team verified this information with Ansberto R. do Passo Neto, Chemical Engineer, Cooperativa Agroindustrial LAR.

The starting date of the project activity is determined to be June 20, 2008, which is before 02 August 2008, as well as prior to the GSP. The PPs presented the following information to the assessment team in order to confirm the prior consideration of CDM:

Project Idea Note (IRL 18), dated 25/08/2006 and edited by various companies and institutions (Itaipu, Copel, Sanepar, LAR, IAP, LACTEC, FPTI). In this paper amongst others the proposed project activity is mentioned and a clear reference to CDM is given. It is indicated that CDM should be explored as it is an additional income source.

The original documents presented have been reviewed and verified based on interviews with Ansberto R. do Passo Neto, Chemical Engineer, Cooperativa Agroindustrial LAR. Therefore the document IRL 18 can be considered appropriate to confirm the prior consideration of CDM. Additionally, in order to confirm that the PPs have taken real actions to continue the activity as CDM, the following timeline has been reviewed against the respective documents presented in the table below:

Activity	Document	Auditor conclusion
Proposal AgCert about the implementation of a biogas CDM project 19/03/2007	IRL 19	Email including an attachment clearly evidences the proposal given by AgCert in March 2007 and shows the interest by LAR to realize the project as CDM project.
Email communication between Ansberto R. do Passo Neto (LAR) and Javier Becerra Sánchez (March/April 2008)	IRL 40	Various Emails discussing the preparation of a proposal for the CDM project have been submitted to the validation team and the sequence of the same is traceable and show the ongoing actions to continue the activity as CDM.
Letter of Intent signed by LAR about CDM consulting services and CER purchase 12/08/2008	IRL 20	Signed document was submitted to the validation team and deems to be authentic.
Emission reduction Purchase	IRL 21	Signed document was submit-

Agreement (ERPA) 25/09/2008		ted to the validation team and deems to be authentic.
Stakeholder process 19/02/2009	IRL 22	Stakeholder invitation letters per Email and announcement at LAR´s website demonstrate real actions to continue the CDM project activity.
Work order sent by Zero Emissions Technologies SA to TUEV SUED 29/04/2009	IRL 108	Work order has been signed by Zero Emissions Technologies SA, thus is highly reliable to evidence the continuity of CDM.
GSP uploading on 15/05/2009[1]	IRL 1	N/A

This confirms that the project complies with the requirements to demonstrate the prior consideration of the CDM.

3.6.2 Identifications of alternatives

The outputs of the proposed project activity are avoidance of methane emissions into the atmosphere and electricity generation from biogas.

The list of alternatives to supply the above mentioned outputs presented in the PDD includes the project activity undertaken without being registered as a CDM project. The remaining alternatives presented do include all plausible scenarios taking into account the local and sectoral situations for the mentioned outputs. The list of alternatives is therefore considered complete.

3.6.3 Investment analysis

Not applicable

3.6.4 Barrier analysis

The project participants have used Attachment A to Appendix B of the "Simplified Modalities and Procedures for Small Scale CDM project activities" and EB35, Annex 34 "Non-binding best practice examples to demonstrate additionality for SSC project activities" to demonstrate additionality of the project.

The investment barrier is shown via an investment comparison analysis. The parameters used in the investment comparison analysis have been validated based on a review of the sources presented in the investment comparison excel file. In the following, for each main parameter the data source is mentioned as well as how the parameter has been validated by the DOE:

Input parameter	Data source	Document (IRL number)	Assessment

[1] http://cdm.unfccc.int/Projects/Validation/DB/3DUWSA28R4S4Q4GACTMAYMNXZLIJTT/view.html

Baseline activity			
Cost for the expansion of the anaerobic lagoon system	Execution budget from Paulo COLPO Projetos Industriais Ltda. and cross checked by execution budget from JAMAR Terraplanagem e Transporte	48,55, 64	PAULO COLPO is an engineering company which has worked for Lar other times in the past as it was communicated during the on-site visit. The additional volume in anaerobic and facultative lagoons (and a small part polishing lagoons) necessary to be constructed due to the increase of wastewater flow, was calculated by LAR together with P. COLPO and is based on the maintenance of the retention times in the baseline scenario. A respective excel file (IRL 48) explaining the calculation, was submitted to the validation team and verified by the same. The increase of 204,313 m^3 is deemed to be apporpriate and reasonable. The same value is substantiated by the proposal given by COLPO (IRL 55). As the execution budget from P. COLPO is slightly higher than that from JAMAR and the first one is used for the investment comparison analysis, namely 6.5 R$/m3, it can be considered as conservative approach for the evaluation of investment costs in the baseline. Besides, there would be some insignificantly small pipeline costs, which would not considerably change the result of the calculated investment costs for the baseline scenario. Thus, the same were not considered

			in the investment analysis. Ground cover lining for new anaerobic open lagoons in Parana State is not necessary according to Saulo de Tarso Granemann Lucena, Technician in agricultural and industrial licensing, Paraná Environmental Institute IAP (IRL 2) except in cases where the ground water level would be affected or sandy soils. This is not the case for LAR project and thus mechanical compaction would be sufficient in the case new anaerobic lagoons would be constructed. The soil compaction is included in the quotation of P. COLPO mentioned above.
Project activity			
Investment			
Biodigesters	Invoices issued to LAR and invoices issued to FINEP Purchase contract	Anaerobic lagoons adaptation and cleaning (53) Membranes FINEP (15,58) Excavation works (59) Gas analyzer (60) PVC pipeline (61) Manpower for biogas pipeline execution and execution of biogas generators warehouse	The invoices and proposal (regarding the methane analyzer) are deemed credible and authentic and can be partly cross-checked with the purchase contract for the biodigesters (IRL 15) between ITAI (executive organ FINEP) and AVESUY.

		(IRL 65) Centrifugal pump (111)	
Electricity generation set	Purchase agreement, FINEP invoices	17,62	The invoices are deemed credible and authentic and can be cross-checked with the purchase contract for 2 generators (IRL 17) between ITAI (executive organ FINEP) and BIOGAS Motores Estacionarios Ltda.
Adaptation of electrical facilities	Invoice	110	The invoice is deemed credible and authentic and is thus accepted by the validation team.
Diffusers in aerated lagoon	Invoices	51	The invoices are deemed credible and authentic and are thus accepted by the validation team.
Primary-secondary-tertiary treatment system and water reuse (second stage of the project)	Commercial proposal, Gratt Industria de Maquinas Ltda	56	The commercial proposal received by Gratt Industria was verified by the validation team. The figures mentioned in the proposal are deemed to be reasonable. GRATT is a well-known and established company in Brazil and other countries founded in the mid 80ies, which has been cross-checked via internet research.
Income from electricity generation			
Electricity price	Monthly electricity invoices from September 2008 until August 2009 indicating peak and non-peak tariff	54,112	Invoices for one year were submitted to the validation team and are deemed to be authentic and credible. The highest peak and non-peak tariffs (0.77478 R$/kWh and 0.12395 R$/kWh respectively) of this period have been taken for the financial analysis and were moreover adjusted by the average increase over that period for the whole crediting period. Peak tariff is applicable during 3 hours of the day and

			non peak tariff during 21 hours per day (IRL 112). The chosen approach can be considered as conservative once the application of high(er) electricity prices mean at the same time more savings from electricity consumption, thus the project activity gets financially more attractive. However, the savings in electricity consumption are by far not enough to compete with the much lower investment costs of the baseline scenario, thus the project activity remains not financially attractive without CDM revenues.
Equipment consumption	Environmental Control Plan, Interview,	2,7,111,113	According to the environmental control plan, the aeration equipment would amount to 210 CVs or be equivalent to 154.45 kW. LAR confirmed however by interview that a more efficient aeration equipment will be purchased (the purchase agreement however does not exist yet) and thus the total capacity for project equipment installed (aeration equipment and agitation pumps) is estimated to be 137.45 kW already including 10% distribution losses. A proposal (IRL 113) for a more efficient aeration system has been submitted to the validation team as well as an invoice for one of the agitation pumps (IRL 111). As the electricity consumption for the project equipment is calculated with a lower installed capacity than indicated in the environmental control plan, and thus higher savings from electricity

			consumption are accounted for in the investment analysis, the chosen approach can be considered as conservative and is accepted by the validation team. It is assumed that the consuming project activity equipment operates 24 hours per day, 7 days a week. This approach is considered to be traceable in the opinion of the validation team, as the agitation pumps and aeration equipment have to be in steady operation in order to guarantee the anaerobic and aerobic process respectively.
Power generation	Financing contract FINEP, Purchase agreement for 2 generators and respective invoices	14, 17 and 62	Power generation from biogas recovered will be 160 kW (200 kVA). In case that biogas generation efficiency would increase, LAR could consider the possibility of installing new engines and would request the respective modifications applying EB48, Annex 66 and 67. The investment comparison analysis considers an installed capacity of 160 kW operating at full capacity during 8,760 hours per year. This approach can be considered as very conservative, as it is quite impossible that engines are operating at full rated capacity throughout the whole year due to necessary maintenance of the engines and other unexpected reasons. The financing contract with FINEP mentions 4 generators with each 50 kVA and even though the configuration changed to two engines of each 50 kVA and one of 100 kVA, the total capacity to be installed re-

			mains the same with 200 kVA (160 kW). The financing contract as well as the purchase agreement and invoices of 2 generator sets of each 50 kVA were verified by the validation team.
Electricity sale price	Power Purchase Agreement between COPEL & Cooperativa Lar	10, 109	The Power Purchase Agreement (PPA) mentions a tariff of R$ 128.10 for each MWh dispatched to the grid. Every 12 months, the tariff is adjusted by inflation according to the PPA. The investment comparison adopts a yearly increase of 3.5%. This increase is based on an estimate for 2010 according to an information given by the Brazilian Central Bank (IRL 109). The signed PPA was submitted to the validation team, thus the document is found to be highly credible and authentic. Considering the inflation in electricity tariff deems to be a conservative approach as therefore revenues of the project activity are getting higher, what makes the project activity more attractive. However, revenues (even by considering inflation) from electricity sales are by far not enough to compete with the much lower investment costs of the baseline scenario, thus the project activity remains not financially attractive without CDM revenues.

The validation team verified each of the above mentioned data sources and concludes that the parameters are plausible and can be considered acceptable under the project situation. The maximum budget financed by FINEP (IRL 52) was conservatively considered in the investment comparison analysis and was finally discounted from the total project costs when comparing LAR´s investment costs in the project scenario with costs in the baseline scenario. The peak tariff for electricity purchased from the grid is the highest of the three considered tariffs (peak tariff, non peak tariff and

tariff for electricity export). During the 3 hours per day of peak tariff, Cooperativa Lar will use the electricity generated in the biogas fed engines for self consumption. With this consideration, Coopeativa Lar will consider a reduction in the electricity consumption during the peak hours.The non peak tariff for electricity purchased from the grid is lower than the price that COPEL according to the PPA would pay for the electricity generated through biogas combustion in engines. Hence, during non-peak hours (21h/day) it is considered in the investment analysis that Cooperativa Lar will sell all the electricity generated to the grid and will purchase the amount of energy required for project equipment operation.
The total investment realized by LAR was compared with the investment necessary in the case of continuation of the baseline scenario considering the increase in wastewater flow. The total investment costs in the project activity are about 50% higher than the one in the continuation of the baseline scenario, thus it is clearly shown, that the project activity is not financially attractive. Furthermore, the validation team due to its sectoral and local expertise can confirm that costs for personnel and O&M costs will be higher in the proposed project activity (due to the complexity of the project activity) than in the baseline scenario, however such higher personnel and O&M costs were not considered in the investment comparison analysis. By considering those costs, the proposed project activity becomes still less attractive.

Furthermore, the data sources deem to be credible and authentic. Furthermore, the validation team verified the financial calculations in the Investment Comparison Analysis excel file (IRL 57) and confirms that the calculations are correct.

Additionality is based on the investment barrier which is the decisive barrier and substantiated by the prevailing practice barrier.

The prevailing practice barrier has been assessed against various official documents such as IRL 66, 76, 86, 87, 88 and 92. By verifying the respective documents, the validation team comes together with its local and sectoral expertise to the conclusion, that the barrier presented in the PDD can be considered real.

The above mentioned barriers would prevent the project activity but would not prevent the baseline of the project. This is confirmed through the documentation review, interviews, and the local and sectoral expertise of the assessment team.

Taking into account the description of the validation of the barriers presented above, the assessment team can confirm, with reasonable certainty, that the barriers are credible and correctly presented to demonstrate the additionality of the project.

3.6.5 Common practice analysis

Not applicable, as the proposed project activity is a SSC project activity.

3.7 Monitoring plan

The monitoring plan presented in the PDD complies with the requirements of the applicable methodologies. The assessment team has verified all parameters in the monitoring plan against the requirements of the methodology; no relevant deviations have been found.
The procedures have been reviewed by the assessment team through document review and interviews with the relevant personnel. This information, together with a physical inspection, allows the assessment team to confirm that the proposed monitoring plan is feasible, and within the project design. The major parameters to be monitored have been discussed with the PPs. In specific, these parameters include the location of meters, data management, and the quality assurance and quality

control procedures to be implemented in the context of the project. The parameters to be monitored are described in the following:

- Electricity generated by the renewable source in the project activity in the year "y" (EG_{BLy}): The net electricity generated by the biogas engines will be measured every few seconds (thus measurements are more accurate than the hourly measurements required by AMS.I.D) by class I accuracy electricity meters installed after each engine and data will be monthly recorded. Electricity meters installed in the power plant will be calibrated as per manufacturer specifications.

- Power consumed by the Project Activity in the year "y" (EC_y): Since there will be no proper electricity meter for measurement of the project equipments´electricity consumption, ECy will be determined as per paragraph 35 of AMS III.H, version 13. It is assumed, that the electrical project equipment operates at full rated capacity, plus 10% to account for distribution losses for 8760 hours per annum. An annual inventory of project equipment will be done.

- Net electricity supplied to the grid by the Project Activity in the year "y" ($EC_{y,grid}$): A class I accuracy electricity meter will be installed to measure every few seconds (thus measurements are more accurate than the hourly measurements required by AMS.I.D) the output electricity sent to the grid from the biogas engines and data will be monthly recorded. The meter will be calibrated as per manufacturer specifications. Measurement results will be cross checked with records for sold electricity and/or invoices every month.

- Volume of wastewater treated in project situation in the year y. This value is the same as the wastewater outflow ($Q_{y,ww,i}$): A Parshall type flowmeter will be installed in stage 1 prior to the coarse screening and in stage 2 one flowmeter will be located prior to the digesters and the other one prior to the physical-chemical flotation tank for measuring the inlet flow considered in the emission reduction calculations. The Parshall flowmeter with an operational accuracy of 0.2% of measured distance and 0.05% of range will be connected to a PLC and will register instantaneous measurements every hour and accumulative measurements will be gathered at the end of each day. The Parshall throat itself cannot be calibrated since it is a narrowing of the water channel. When electronic measurement devices will be installed in the Parshall flume for measuring the water flow, these devices (sensor) will be calibrated as per manufacturer specifications.

- Chemical oxygen demand of inflow wastewater in the system i in year y ($COD_{y,i,ww,untreated}$): COD of inflow wastewater will be measured periodically every 15 days by on-site manual sampling as per the Standard Method for the Examination of Water and Wastewater (American Public Health Association). Furthermore, once every 45 days, a sample will be sent to a third party for cross-checking. A sampling plan, described in Annex 4 of the PDD and as per the "General Guidelines for Sampling and Surveys for SSC CDM Project Activities" (EB50, Annex30) will be followed.

- Chemical Oxygen Demand of the wastewater treated by system i in the project situation in the year y ($COD_{y,ww,treated,i}$) which is equivalent to $COD_{ww,untreated,y,i}$ in the immediate next system and to $COD_{ww,discharge,PJ,k,y}$ when system i is the last system affected by the project activity.

COD of the wastewater treated in a treatment system is the same as outlet COD from system i. As COD of inflow wastewater, it will be measured twice a month after each treatment system in the project boundary by on site manual sampling as per the Standard Method for the Examination of Water and Wastewater (American Public Health Association). Furthermore, once every 45 days, a sample will be sent to a third party for cross-checking. A sampling plan, described in Annex 4 of the PDD and as per the "General Guidelines for Sampling and Surveys for SSC CDM Project Activities" (EB50, Annex30) will be followed.

-CO_2 Combined Margin Emission Factor for Grid Electricity during the year y (EF_{grid} (CM)): The emissions factor is annually updated by the Brazilian DNA using the Dispatch Data Analysis for calculation of the emissions factor. As already mentioned in chapter 3.5.4.1., the emission factor calculation used in this PDD, for estimating purposes only, must be verified and updated accordingly using the most recent data available at the time of the verification process.

- Volume of biogas recovered in the year y ($V_{biogas,y}$): The amount of biogas recovered will be monitored on dry basis by at least one mass thermal flowmeter (not necessarily one flowmeter for each engine) with temperature and pressure correction, resulting in Nm3 measurements. Measurement intervals are of one hour or smaller discrete intervals. Since the PPs are not applying for emission reductions due to flaring but only for the part of biogas recovered which is used for electricity generation, the only volume of biogas monitored will be the biogas to engines, which is the one for which emission reductions are being applied. The mass flow meter(s) will be periodically calibrated as per manufacturer´s specifications.

- Methane fraction in biogas ($w_{ch4,ww}$): A gas analyzer will continuously measure the methane fraction in biogas on a dry basis. The analyzer will be periodically calibrated as per manufacturer´s specifications.

COD is measured at the following locations:
Stage 1:

1. COD Outlet flotation tank / COD inlet to biodigesters
2. COD Outlet biodigesters / COD inlet aeration treatment
3. COD Outlet aeration treatment / COD inlet facultative lagoon nº1

Stage 2:

1. COD Inlet biodigesters
2. COD Inlet Physical-Chemical Flotation Tank
3. COD Outlet biodigesters
4. COD Outlet Physical-Chemical Flotation Tank / COD Inlet aeration treatment
5. COD Outlet aeration treatment / COD Inlet Secondary Decanter

The aerobic conditions in the PC Flotation tank are monitored according to paragraph 22 of the methodology AMS III.I, version 08. The operational parameters are continuously monitored to ensure that they are always kept in the design range of operating conditions.

Referring to the part of the project which is affected by AMS III.H, ex post emission reductions are based on the lowest value of the following as per paragraph 30 of the methodology:

(i) The amount of biogas recovered and fuelled or flared (MD_y) during the crediting period, that is monitored ex post;

(ii) Ex post calculated baseline, project and leakage emissions based on actual monitored data for the project activity."

The project will follow the answer given in the Request for Clarification, SSC_324 by the SSC WG by applying a destruction efficiency of 100% for the biogas combusted in engines. Thus, the combustion efficiency will not be monitored. The rsponse from the SSC WG to the clarification SSC_324 concerning AMS-III.H states that "*if the biogas is combusted for a gainful use of the released energy as in an engine or a power plant, a destruction efficiency of 100% can be used for the portion of biogas that is combusted when applying AMS-III.H, i.e. use a value of 100% for FE in equation 16 in paragraph 32 for the portion of biogas that is combusted for a gainful use*".

Therefore, we find that the PP's will be able to implement the monitoring plan and the achieved emission reductions can be reported ex-post and verified.

3.8 Sustainable development

The project contributes to the sustainable development of the host Party. This was confirmed during the on-site visit and will be cross-checked by the audit team before submitting the project for registration once the LoA has been received.

3.9 Local stakeholder consultation

The relevant local stakeholders have been invited via invitation letters and via a publication at Cooperativa Agroindustrial Lar´s website in February 2009. The evidence of these invitations is found in IRL 22. A stakeholders' meeting was conducted on February, 19th, 2009. The assessment team has reviewed the documentation in order to validate the inclusion of relevant stakeholders. The team´s local expertise confirmed that the communication method used to invite the stakeholders was appropriate. The Brazilian DNA defines that the stakeholder process has to be carried out at least 15 days prior to the start of validation and the minimum of stakeholders who have to be consulted (resolution n° 7, from March 05, 2008, paragraph 1). During the site visit, the DOE together with the project participants realized that there were some of those required entities that had not been invited to the stakeholder meeting by mistake. The project participants asked the DNA about the possibility of inviting these entities for comments after the stakeholders' meeting.

The DNA agreed once the comments received by these entities would be considered in the final version of the PDD (IRL 105). In July 2009, all by the Brazilian DNA required entities have been consulted (IRL 22). After 30 days, no comments were received by the project participant by any of the invited entities.

The summary of comments presented in the PDD has been verified with the documentation of the stakeholder consultation and is found to be complete.

Comments presented by the local stakeholders in the stakeholder meeting have been taken into account by the PPs. This has also been verified with information obtained during interviews.

Hence, the local stakeholder consultation has been adequately performed according to the CDM requirements.

3.10 Environmental impacts

According to Brazilian regulations, the proposed project activity does not require an EIA, however an Environmental Control Plan (IRL 7 and 9) which was presented to the validation team. A valid environmental installation license (IRL 8) was presented to the validation team which clearly shows that LAR is in compliance with the environmental legislation. No significant negative environmental impacts are expected from the proposed project activity. The environmental control plan (IRL 7) mentioning on page 42 some environmental impacts, however all not significant, confirms the correctness of the approach used by the PPs. We conclude that the PPs followed the requirements of the host country in regard to environmental impacts.

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4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project documents on the UNFCCC website, and invited comments by affected Parties, stakeholders, and non-governmental organisations during a 30 day period.

The following table presents all gathered key information:

website: http://cdm.unfccc.int/Projects/Validation/DB/3DUWSA28R4S4Q4GACTMAYMNXZLIJTT/view.html	
Starting date of the global stakeholder consultation process: 2009-05-15	
Comment submitted by: None	**Issues raised:** -
Response by TÜV SÜD: -	

5 VALIDATION OPINION

TÜV SÜD has performed a validation of the following proposed CDM project activity:

Cooperativa Lar Wastewater Treatment and Energy Generation Project

Standard auditing techniques have been used for the validation of the project. A methodology-specific protocol for the project has been prepared to carry out the audit in order to present the outcome in a transparent and comprehensive manner.

The review of the project design documentation, subsequent follow-up interviews and further verification of references have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria in the protocol. In our opinion, the project meets all relevant UNFCCC requirements for the CDM if the underlying assumptions do not change. TÜV SÜD will recommend the project for registration by the CDM Executive Board.

An analysis, as provided by the applied methodology, demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions as specified within the final PDD version.

The validation is based on the information made available to us, as well as the engagement conditions detailed in this report. The validation has been performed following the VVM requirements. The single purpose of this report is its use during the registration process as part of the CDM project cycle. TÜV SÜD can therefore not be held liable by any party for decisions made, or not made, based on the validation opinion beyond that purpose.

Munich, 29-04-2010

Cuiyun Zhang
Deputy Head of the Certification Body "climate and energy"
TÜV SÜD Industrie Service GmbH

Fortaleza, 29-04-2010

Johann Thaler
Assessment Team Leader

Annex 1: Validation Protocol

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD
A. General description of small-scale project activity				
A.1. Title of the small-scale project activity				
A.1.1. Does the used project title clearly enable to identify the unique CDM activity?	1	Yes. The project title clearly identifies the proposed project activity. It indicates the type of the project activity (wastewater treatment and energy generation project) and the name of the project owner (Cooperativa Lar, in the following just called "LAR").	þ	þ
A.1.2. Are there any indication concerning the revision number and the date of the revision?	1	Yes. The PDD, dated 18/05/2009, version 01 was uploaded to the GSP process.	þ	þ
A.1.3. Is this consistent with the time line of the project's history?	1	Yes.	þ	þ
A.2. Description of the small-scale project activity				
A.2.1. Is the description delivering a transparent overview of the project activities?	1,2	Yes, however see CAR 1. *Purpose of the proposed project activity:* The purpose of the proposed project activity is to modify the current wastewater treatment in order to partially recover the biogas generated during the anaerobic treatment and to avoid methane emissions by recovering methane released from anaerobic treatment and by progressively replace anaerobic by aerobic treatment. The biogas recovered will be used for electricity generation which will be consumed in the slaughterhouse. *How does the proposed project activity reduce GHG emissions:* There are 3 sources: a) avoidance of methane emissions from the existing open anaerobic lagoons by the installation of a biogas recovery system (first phase) **à** application of AMS III-H.: move from a high GHG wastewater treatment practice consisting of open air anaerobic	See CAR 1	þ

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD
		lagoons to a lower GHG practice, with anaerobic digestion, biogas capture and combustion. b) avoidance of methane emissions through the replacement of anaerobic by aerobic treatment systems **à** application of AMS III-I: modification of the baseline anaerobic treatment in open lagoons to aerobic treatment by the installation of aerating equipment. c) displacement of electricity from the grid through less carbon intensive electricity source (biogas) **à** application of AMS I-D. : recovered biogas will be combusted in specific engines and electricity will be generated and consumed at LAR´s industrial facilities. Any excess of biogas will be flared. *Contribution to sustainable development:* The proposed project activity has environmental, social and economical benefits which are in detail explained in A.2. of the PDD. a) environmental benefits: -mitigation of GHG emissions from the lagoons -mitigation of odours and improvement of air quality -reduction of water demand for irrigation -mitigation of potential safety hazards -reduction of water demand for industrial purposes b) Social benefits -Improvement of air quality and local environment -Employment creation c) Economical benefits -efficiency of utilization of resources -local life quality improvement		

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD
A.2.2. What proofs are available demonstrating that the project description is in compliance with the actual situation or planning?	1,2,7,8,9,10,11,15,17,25,26,27,28,30,31,32,34,37	-Environmental Control Plan from March 2009 (IRL 7) -Environmental installation license (IRL 8) -Environmental Control Plan from 04/2003 (IRL 9) mentioning the existence of anaerobic and aerobic lagoons inclusive a map of the open lagoon system -Power Purchase Agreement with COPEL (IRL 10) -Grid connection approval (IRL 11) -Purchase agreement (2 biodigesters) (IRL 15) between ITAI (executive organ of FINEP) and AVESUY. The 2 biodigesters are financed by funds from FINEP and ITAI as executive organ from FINEP signed the purchase agreement with AVESUY, the equipment provider. -Purchase agreement (2 generators of each 50 kVA) (IRL 17); a third generator (100 kVA) will be purchased later on -Proposal for the equipment of the physical-chemical treatment (stage 2) (IRL 25) -Proposal for the civil construction (stage 2) (IRL 26) -Public tendering for biodigester project study (IRL 27): Pages 14 and 15 clearly mention the existence of anaerobic lagoons in the baseline scenario -Final Report of the biodigester project (IRL 28): Description of the installation of the biodigesters. The report mentions as well the preparation of the anaerobic lagoons before coverage. -Photos of the anaerobic lagoons in the baseline scenario and its cleaning process (IRL 30). -Proposals for purchase of one open flare (IRL 31) -COD samples of wastewater (IRL 32): PPs together with the validation team decided on-site to use an average of COD samples	þ	þ

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD
		(period between September 2006 and June 2008) for emission reduction calculation purposes. This is in accordance with §5 of AMS III.I. and § 17 of AMS III.H that "historical records of at least one year prior to the project implementation shall be used". -Records of wastewater flow (IRL 37) -Contract for the civil construction of the power house (IRL 34)		
A.2.3. Is the information provided by these proofs consistent with the information provided by the PDD?	1,2,7,8,9,10,11,15,17,25,26,27,28,30,31,32,34,37	Yes, however see the following CAR. **Corrective Action Request No.1.** 1) 3 gen-sets are planned instead of 2 mentioned in A.2. Please revise. 2) PPs communicated during on-site visit that one part of electricity could not only be consumed for LAR´s internal purposes, but could be exported to the grid. PDD should be updated respectively.	**CAR**	**þ**
A.2.4. Is all information presented consistent with details provided by further chapters of the PDD?	1	Yes.	**þ**	**þ**
A.2.5. Does the description of the technology	1	**Clarification Request No. 1.**	**CR**	**þ**

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD
to be applied provide sufficient and transparent input to evaluate its impact on the greenhouse gas balance?		Please clarify in A.2. whether the excess biogas will be flared in an open or enclosed flare system.		
A.2.6. Is the brief explanation how the project will reduce greenhouse gas emission transparent and suitable?	1	Yes. See A.2.1.	þ	þ
A.2.7. Is an explanation provided how the proposed project activity will contribute to sustainable development?	1	Yes. See A.2.1.	þ	þ
A.3. Project participants				
A.3.1. Is the form required for the indication of project participants correctly applied?	1	Yes.	þ	þ
A.3.2. Is the participation of the listed entities or Parties confirmed by each one of them?	1,23	The Modalities of Communication were submitted to the validation team. (IRL 23) **Open issue:** The Letters of Approval of Spain and Brazil should be submitted to the validation team.	**Open Issue**	
A.3.3. Is all information on participants / Parties provided in consistency with details provided by further chapters of the PDD (in particular annex 1)?	1	**Corrective Action Request No.2.** The "Ltda." In Zeroemissions do Brasil Ltda. is missing in Annex 1. Please add.	**CAR**	þ
A.4. Technical description of the small-scale project activity				
A.4.1. *Location of the small-scale project activity*				
A.4.1.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)?	1,2, 35	Yes. The proposed project activity is located at Rod. BR277, km 653, Agrocafeeira, Matelandia, in the State of Parana, South Brazil. GPS coordinates are indicated in A.4.1.4., however it is not	**CAR**	þ

		clear from which exact location the GPS coordinates were taken. During the on-site visit the following GPS coordinates were taken (IRL 35): a) location between the 2 biodigesters: S 25°12.1577', W 53°57.1925' ; accuracy of GPS measurement 25 m. b) location of the physical-chemical treatment equipment: S 25°12.2618', W 53°57.1302'; accuracy of GPS measurement 5.5 m. **Corrective Action Request No.3.** Please revise the GPS coordinates as per the on-site measurements and indicate in A.4.1.4. from which exact locations the GPS coordinates were taken.		
A.4.1.2. How is it ensured and/or demonstrated, that the project proponents can implement the project at this site (ownership, licenses, contracts etc.)?	2,24	An official land registry (IRL 24) presented during the on-site visit evidences the ownership of LAR of the location where the proposed project activity will be located.	**þ**	**þ**
A.4.2. *Type and category(ies) and technology/measure of the small-scale project activity*				
A.4.2.1. To which type(s) does the project activity belong to? Is the type correctly identified and indicated?	1	The proposed project activity belongs to Type I (Renewable Energy Projects) and Type III (Other Project Activities). The types are correctly identified and indicated in A.4.2. of the PDD.	**þ**	**þ**
A.4.2.2. To which category (ies) does the project activity belong to? Is the category correctly identified and indicated?	1	The proposed project activity belongs to categories III.H., III.I. and I.D.. The categories are correctly identified and indicated in A.4.2. of the PDD.	**þ**	**þ**
A.4.2.3. Does the technical design of the project activity reflect current good practices?	1,2	See A.4.2.7.	**See CAR**	**þ**
A.4.2.4. Does the implementation of the project activity require any technology transfer from Annex-I-countries to the host country	1	The PDD does not inform yet whether any technology transfer from Annex-I countries to the host country takes place. **Corrective Action Request No.4.**	**CAR**	**þ**

(ies)?		Information should be provided in A.4.2. of the PDD whether the proposed project activity requires any technology transfer from Annex-I countries.		
A.4.2.5. Is the technology implemented by the project activity environmentally safe?	1,2	**Clarification Request No. 2.** Please demonstrate that the technology implemented by the project activity will be environmentally safe and include some information in A.4.2. of the PDD.	**CR**	**þ**
A.4.2.6. Is the information provided in compliance with actual situation or planning?	1,2	Yes. Interviews with the responsible chemical engineer revealed that the information provided is in compliance with the actual situation however some information should be added or corrected as reflected in the following CARs as well as in other CARs/CRr throughout the protocol. **Corrective Action Request No.5.** Referring to chapter A.4.2., the following items should be considered: 1. Figure 3 should add 2 polishing lagoons as it was validated during the on-site visit. 2. The description of HDPE and PVC for the biodigester cover should be revised. 3. In the case aerobic lagoons are at the same time aerated, the same should be clearly mentioned. 4. Please revise the aeration equipment in A.4.2. it was communicated during the on-site visit. 5. Figure 5 should be revised as the aerated lagoons after the physical-chemical flotation system are serial and not partly serial and partly parallel. 6. The engine configuration should be revised as it was communicated during the on-site visit.	**CAR** **See CARs/ CRs**	**þ**
A.4.2.7. Does the project use state of the art technology and / or does the technology	1,2	The technology results in a significantly better performance than commonly used technologies in the host country. Common tech-	**CR**	**þ**

result in a significantly better performance than any commonly used technologies in the host country?		nologies applied in chicken slaughterhouses are according to the interviews provided on-site open anaerobic lagoons and physical treatment systems, however not the combination of anaerobic biodigester and aerobic physical-chemical treatments, however documented evidence has not been provided yet. **Clarification Request No. 3.** Please provide evidence that open anaerobic lagoons and physical treatment systems are common practice in (chicken) slaughterhouses.		
A.4.2.8. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1,2, 29	It is not expected that the project technology will be substituted by other or more efficient technologies within the project period. This was confirmed by a declaration signed by LAR (IRL 29).	**þ**	**þ**
A.4.2.9. Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period?	1,2	B.7.2. mentions that "the project personnel will be trained by the CDM monitoring team on procedures, calibrations reporting and every issue related to monitoring plan development. Management, plant managers and all the staff involved in the project activity will receive training on the principles of the project activity, the monitoring plan (equipment and monitoring structure), quality issues and on the CDM procedures for this project activity. Technicians will receive a specific training in the plant operation and monitoring activities."	**þ**	**þ**
A.4.2.10. Is information available on the demand and requirements for training and maintenance?	1,2	See A.4.2.9.	**þ**	**þ**
A.4.2.11. Is a schedule available for the implementation of the project and are there any risks for delays?	1,2	**Corrective Action Request No.6.** A project implementation schedule about the most important implementation steps should be presented to the validation team and the same should be included into the PDD.	**CAR**	**þ**
A.4.3. *Estimated amount of emission reductions over the chosen crediting period*				
A.4.3.1. Is the table format required for the indi-	1	Yes.	**þ**	**þ**

cation of projected emission reductions correctly applied?				
A.4.3.2. Are the figures provided consistent with other data presented in the PDD?	1	Yes. The figures are consistent throughout the PDD, however have to be revised due to various changes in input parameters for the CER calculation.	**See CARs**	**þ**
A.4.3.3. Are the figures consistent with the small-scale criteria for the used Type?	1,2,5,6	Yes. Aggregate emission reductions are less than 60,000 tCO2 p.a. throughout the whole crediting period.	**þ**	**þ**
A.4.4. *Public funding of the small-scale project activity*				
A.4.4.1. Is the information provided on public funding provided in compliance with the actual situation or planning as available by the project participants?	1,2, 13, 14	The information provided on public funding is in compliance with the actual situation as it was evidenced during the on-site audit. The first stage of the proposed project activity (except the flare system as well the preparation of the anaerobic lagoons before covering) is financed by funds from FINEP (about 18% of the total investment volume of the proposed project activity) (IRL 14); the second stage will be completely financed by LAR (about 82% of the total investment volume). FINEP is a Brazilian Federal Funding Company according to the description provided in A.4.4. of the PDD. No Official Development Assistance (ODA) from Annex 1 Parties is involved in the proposed project activity, which is confirmed by a declaration signed by President and Vice-President of LAR (IRL 13). **Corrective Action Request No.7.** It should be mentioned in A.4.4. that about 18% of the total investment volume will be financed by FINEP, and the remaining 82% by LAR´s own equity capital.	**CAR**	**þ**
A.4.4.2. Is all information provided consistent with the details given in remaining chapters of the PDD (in particular annex 2)?	1	Yes. Both A.4.4. an Annex 2 state that the financing from FINEP is not from Annex-1 countries, thus can not be considered as Official Development Assistance (ODA). The same can be confirmed by the validation team.	**þ**	**þ**
A.4.5. *Confirmation that the small-scale project activity is not a debundled component of a large scale project activity*				

<table>
<tr><td>A.4.5.1. Is there a registered small-scale CDM project activity or an application to register another small-scale CDM project activity: with the following characteristics:</td><td>1,2</td><td><table><tr><th>Debundling checklist</th><th>Yes / No</th></tr><tr><td>The same project participants?</td><td>No</td></tr><tr><td>In the same project category and technology/measure?</td><td>No</td></tr><tr><td>Registered within previous two years? Or in registration process?</td><td>No</td></tr><tr><td>Whose boundary is within 1 km of the project boundary of the small scale project activity under consideration?</td><td>No</td></tr></table></td><td>þ</td><td>þ</td></tr>
<tr><td>A.4.5.2. If the answer to all the above question is ‘Yes’ then does the total size of the small scale project activity combined with previously registered small scale CDM project activity exceeds the limits of small scale CDM project activities?</td><td>--</td><td>Not applicable</td><td>þ</td><td>þ</td></tr>
<tr><td colspan="5">B. Application of a baseline and monitoring methodology</td></tr>
<tr><td colspan="5">B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity</td></tr>
<tr><td>B.1.1. Are reference number, version number, and title of the baseline and monitoring methodology clearly indicated?</td><td>1,2,4,5,6</td><td>The proposed project activity applies 3 methodologies:
AMS III.H., version 13, AMS III.I., version 08, AMS I.D., version 15 are clearly indicated.</td><td>þ</td><td>þ</td></tr>
<tr><td>B.1.2. Is the applied version the most recent one and / or is this version still applicable?</td><td>1,2,4,5,6</td><td>The applied versions of all 3 methodologies are still applicable.</td><td>þ</td><td>þ</td></tr>
<tr><td colspan="5">B.2. Justification of the choice of the methodology and why it is applicable to the project activity</td></tr>
<tr><td>B.2.1. Is the applied methodology considered the most appropriate one?</td><td>1,2,4,5,6</td><td>The applied methodologies are considered to be the most appropriate ones.</td><td>þ</td><td>þ</td></tr>
<tr><td colspan="5">Integrate the required amount of sub-checklists on the applicability criteria as given by <u>AMS III.H</u> and comment on at least every line answered with “No”;</td></tr>
</table>

<table>
<tr>
<td>B.2.1.1. Criterion 1: Project substitutes aerobic wastewater or sludge treatment systems with anaerobic systems with biogas recovery and combustion.</td>
<td>1,2,5</td>
<td><table><tr><th>Applicability checklist</th><th>Yes / No / NA</th></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table></td>
<td>þ</td>
<td>þ</td>
</tr>
<tr>
<td>B.2.1.2. Criterion 2: Project introduces anaerobic sludge treatment system with biogas recovery and combustion to an existing wastewater treatment plant without sludge treatment.</td>
<td>1,2,5</td>
<td><table><tr><th>Applicability checklist</th><th>Yes / No / NA</th></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table></td>
<td>þ</td>
<td>þ</td>
</tr>
<tr>
<td>B.2.1.3. Criterion 3: Project introduces biogas recovery and combustion to an existing sludge treatment system.</td>
<td>1,2,5</td>
<td><table><tr><th>Applicability checklist</th><th>Yes / No / NA</th></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table></td>
<td>þ</td>
<td>þ</td>
</tr>
<tr>
<td>B.2.1.4. Criterion 4: Project introduces biogas recovery and combustion to an existing anaerobic wastewater treatment system such as anaerobic reactor, lagoon, septic tank or an on site industrial plant.</td>
<td>1,2,5</td>
<td><table><tr><th>Applicability checklist</th><th>Yes / No / NA</th></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table></td>
<td>þ</td>
<td>þ</td>
</tr>
</table>

<table>
<tr>
<td>B.2.1.5. Criterion 5: Project introduces anaerobic wastewater treatment with biogas recovery and combustion, with or without anaerobic sludge treatment, to an untreated wastewater stream.</td>
<td>1,2,5</td>
<td>
<table>
<tr><th>Applicability checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr>
<tr><td>Compliance provable?</td><td>NA</td></tr>
<tr><td>Compliance verified?</td><td>NA</td></tr>
</table>
</td>
<td>þ</td>
<td>þ</td>
</tr>
<tr>
<td>B.2.1.6. Criterion 6: Project introduces sequential stage of wastewater treatment with biogas recovery and combustion, with or without sludge treatment, to an existing anaerobic wastewater treatment system without biogas recovery.</td>
<td>1,2,5</td>
<td>
<table>
<tr><th>Applicability checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr>
<tr><td>Compliance provable?</td><td>Yes</td></tr>
<tr><td>Compliance verified?</td><td>Yes</td></tr>
</table>
Various evidences have been presented to the validation team and are listed in A.2.2.
</td>
<td>þ</td>
<td>þ</td>
</tr>
<tr>
<td>B.2.1.7. In case a kind of anaerobic lagoon is related to the scenario, are the criteria with the following characteristics fulfilled?:</td>
<td>1,2,5,7,9,27,28,30,33,39</td>
<td>
<table>
<tr><th>Checklist</th><th>Yes / No</th></tr>
<tr><td>Pond deeper than 2 meters?</td><td>Yes</td></tr>
<tr><td>No aeration?</td><td>Yes</td></tr>
<tr><td>Ambient temperature above 15°C at least during part of the year, on a monthly average basis?</td><td>Yes</td></tr>
<tr><td>Volumetric loading rate of COD above 0.1 kg COD m^{-3} day^{-1}?</td><td>Yes</td></tr>
<tr><td>Residence time of the non-soluble part of the organic matter in anaerobic lagoons is at least 30 days</td><td>Yes</td></tr>
</table>
Evidences that the above characteristics are fulfilled, are indicated in A.2.2.
-Anaerobic lagoons are deeper than 2 meters and no aeration in
</td>
<td>CR</td>
<td>þ</td>
</tr>
</table>

		those lagoons took place (IRL 2,7,9,27,28,30), however see the CR below. -Sludge removal occurred not more than every 5 years from the first anaerobic lagoon according to information provided by the Chemical Engineer (Ansberto R. do Passo Neto) and is substantiated by photos (IRL 30). -Weather records (IRL 33) from the Agronomic Institute of Parana clearly show that the average ambient temperature in the region where the proposed project activity is located, is above 15°C. -Volumetric loading rate has been calculated (IRL 39) and the validation team confirms that for all anaerobic lagoons the same is above 0.1 kg COD m^{-3} day^{-1}. **Clarification Request No. 4.** After checking the Email communication between LAR (Ansberto R. do Passo Neto) and Zeroemissions (Javier Becerra Sanchez) in April 2008, the validation team is in doubts whether the information about 3 anaerobic lagoons in the PDD (what was as well communicated to the team during the on-site visit) for the baseline scenario is correct. In the Email from 12/04/2008 Passo Neto indicates to Becerra Sanchez **2 anaerobic lagoons, one aerated lagoon**, 4 facultative lagoons and 3 polishing lagoons ("Processo industri: al – peneiras- flotador – lagoa Anaerobica 01 – Lagoa Anaerobica 02 – Lagoa Aerada – seguindo para mais 04 lagoas Facultativas e 03 lagoas de polimento"). Concrete evicence(s) for a possible 3rd anaerobic lagoon should be submitted to the validation team, since all submitted documents until now do not mention such a 3rd anaerobic lagoon.		
Project activity utilise the biogas recovered for combustion/flaring.	1,2,5,17,31	<table><tr><td>Applicability checklist</td><td>Yes / No / NA</td></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr></table>	**þ**	**þ**

		Compliance provable? | Yes Compliance verified? | Yes Evidences: IRL 17, 31		
B.2.1.8. Project activity utilise the biogas recovered for thermal or electrical energy generation directly.	1,2,5 ,17, 34	Applicability checklist | Yes / No / NA Criterion discussed in the PDD? | Yes Compliance provable? | Yes Compliance verified? | Yes Electrical energy will be generated with the biogas; only in cases of excess of biogas or maintenance or unexpected breakdowns of the generators, the biogas will be flared. Evidences: IRL 17, 34	þ	þ
B.2.1.9. Project activity utilise the biogas recovered for thermal or electrical energy generation after bottling of upgraded biogas.	1,2,5	Applicability checklist | Yes / No / NA Criterion discussed in the PDD? | NA Compliance provable? | NA Compliance verified? | NA	þ	þ
B.2.1.10. Project activity utilise the biogas recovered for thermal or electrical energy generation after upgrading and injection of biogas into a natural gas distribution grid with no significant transmission constraints.	1,2,5	Applicability checklist | Yes / No / NA Criterion discussed in the PDD? | NA Compliance provable? | NA Compliance verified? | NA	þ	þ
B.2.1.11. Project activity utilise the biogas	1,2,5		þ	þ

recovered for thermal or electrical energy generation after upgrading and transporting the biogas via a dedicated piped network to a group of end users.		Applicability checklist / Yes / No / NA Criterion discussed in the PDD? / NA Compliance provable? / NA Compliance verified? / NA		
B.2.1.12. Project activity utilise the biogas recovered for hydrogen production.	1,2,5	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? / NA Compliance provable? / NA Compliance verified? / NA	þ	þ
B.2.1.13. In case where the project activity is covered under paragraph 2(a), Does the PDD clearly indicate the use of the corresponding category under type 1 (applicable checklist should be also filled)?	1,2,5	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? / Yes Compliance provable? / Yes Compliance verified? / Yes	þ	þ
B.2.1.14. In the case where the recovered biogas is utilized for production of hydrogen (project activity covered under paragraph 2 (d)), Does the PDD indicate the use of the corresponding category under AMS III.O (applicable checklist should be also filled)?	1,2,5	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? / NA Compliance provable? / NA Compliance verified? / NA	þ	þ
B.2.1.15. Applicable for project activity covered under paragraph 2 (b). Does the sales outside the project boundary are en-	1,2,5	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? / NA	þ	þ

sured via contract between the bottled biogas vendor and the end-user?		Compliance provable? NA Compliance verified? NA		
B.2.1.16. Does the project activity claims emission reduction from the displacement of fossil fuels from the end use of bottled biogas?	1,2,5	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? NA Compliance provable? NA Compliance verified? NA	þ	þ
B.2.1.17. For the cases where the end use of the bottled biogas is included in the project boundary and is monitored during the crediting period: does the project describes the CO2 emission avoided by the displacement of the fuels is according the type I methodology (applicable checklist should be also filled)?	1,2,5	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? NA Compliance provable? NA Compliance verified? NA	þ	þ
B.2.1.18. In case where the project activities covered under paragraph 2 (c i) emission reductions from the displacement of the use of natural gas is eligible under this methodology: Does the geographical extent of the natural gas distribution grid in the host country boundaries is provide in the PDD?	1,2,5	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? NA Compliance provable? NA Compliance verified? NA	þ	þ
B.2.1.19. In case where the project activities covered under paragraph 2 (c ii): Does the emission reductions for the displacement of the use of fuels is claimed and reported according the provision in the corresponding type I methodology,	1,2,5	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? NA Compliance provable? NA Compliance verified? NA	þ	þ

e.g. AMS I.C.?				
B.2.1.20. In case of project activities covered under paragraph 2 (b) and (c): B.2.1.21. Is the upgrade done by way of absorption with water (with or without recovery of methane emissions from discharge) such that the methane content of the upgraded biogas is in accordance with national regulations (where there exist) or, in the absence of national regulation, a minimum of 96% (by volume)?	1,2,5	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? NA Compliance provable? NA Compliance verified? NA	þ	þ
B.2.1.22. In case of new facilities (Greenfield projects) and project activities involving a change of equipment resulting in a capacity addition of the wastewater or sludge treatment system compared to the designed capacity of the baseline treatment system: Do they comply with the requirements in the General Guidance for SSC methodologies concerning these topics?	1,2,5	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? NA Compliance provable? NA Remaining lifetime of the equipment replaced NA Compliance verified? NA	þ	þ
B.2.1.23. In case of project activities covered under paragraph 2 (b) and (c): B.2.1.24. Is the additional guidance provided in annex I followed for the calculations in addition to the procedures in the relevant sections below?	1,2,5	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? NA Compliance provable? NA Compliance verified? NA	þ	þ
B.2.1.25. Are the projected aggregated emission reductions less than or equal to 60,000 tonne CO_2 per annum for all type III components of project activity?	1,2,5	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? Yes Compliance provable? Yes	þ	þ

		Compliance verified? | Yes Evidences: 2, 36		
B.2.1.26. If the project is under a programme of activities, have all the applicability criteria and additional requirements been considered according to the methodology?	1,2,5	Applicability checklist | Yes / No / NA Criterion discussed in the PDD? | NA Compliance provable? | NA Compliance verified? | NA	þ	þ
Integrate the required amount of sub-checklists on the applicability criteria as given by **AMS III.I** and comment on at least every line answered with "No";				
B.2.1.27. Criterion 1: Project comprises measures that avoid the production of methane from biogenic organic matter in wastewaters being treated in anaerobic lagoons.	1,2,6,7,9,27,28,30	Evidences: IRL 2,7,9,27,28,30 Applicability checklist | Yes / No / NA Criterion discussed in the PDD? | Yes Compliance provable? | Yes Compliance verified? | Yes	þ	þ
B.2.1.28. Criterion 2: The project activity substitutes anaerobic lagoons by aerobic systems *Anaerobic lagoons* are hereby defined as ponds deeper than 2 meters, without aeration, ambient temperature above 15°C, at least during part of the year, on a monthly average basis, and with a volumetric loading rate of COD above 0.1 kg COD m^{-3} day^{-1} *Aerobic systems* are defined as systems using oxygen and microbial action to treat wastewaters	1,2,6,7,9,27,28,30	Applicability checklist | Yes / No / NA Criterion discussed in the PDD? | Yes Compliance provable? | Yes Compliance verified? | Yes Evidences: IRL 2,7,9,27,28,30	þ	þ
B.2.1.29. Criterion 3: The project activity	1,2,6	Evidence: IRL: 7,25	þ	þ

does not recover or combust methane in wastewater treatment facilities (unlike III.H)	,7,25	Applicability checklist: Yes / No / NA Criterion discussed in the PDD? Yes Compliance provable? Yes Compliance verified? Yes		
B.2.1.30. Criterion 4: Are the projected emission reductions less than or equal to 60,000 tonnes CO_2 equivalent per annum?	1,2,6 ,36	Evidence: IRL 2,36 Applicability checklist: Yes / No / NA Criterion discussed in the PDD? Yes Compliance provable? Yes Compliance verified? Yes	þ	þ
Integrate the required amount of sub-checklists on the applicability criteria as given by **AMS.I-D** and comment on at least every line answered with "No";				
B.2.1.31. Criterion 1: This category comprises renewable energy generation units, such as photovoltaics, hydro, tidal/wave, wind, geothermal and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.	1,2,4 ,7,10 ,11, 17	Evidence: 7,10,11,17 Applicability checklist: Yes / No / NA Criterion discussed in the PDD? Yes Compliance provable? Yes Compliance verified? Yes	þ	þ
B.2.1.32. Criterion 2: If the unit added has both renewable and non-renewable components (e.g.. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.	1,2,4 ,7,10 ,11, 17	Evidence: 2,7,10,11,17 Applicability checklist: Yes / No / NA Criterion discussed in the PDD? Yes Compliance provable? Yes Compliance verified? Yes	þ	þ
B.2.1.33. Criterion 3: Criterion 3: Combined heat and power (co-generation) sys-	1,2,4	Applicability checklist: Yes / No / NA	þ	þ

tems that supply electricity to and/or displace electricity from a grid are **not** included in this category.		Criterion discussed in the PDD? Yes Compliance provable? N/A Compliance verified? N/A		
B.2.1.34. Criterion 4: In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	1,2,4	Applicability checklist: Yes / No / NA Criterion discussed in the PDD? Yes Compliance provable? N/A Compliance verified? N/A	þ	þ
B.2.1.35. Criterion 5: Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW.	1,2,4	Applicability checklist: Yes / No / NA Criterion discussed in the PDD? Yes Compliance provable? N/A Compliance verified? N/A	þ	þ
B.3. Description of the project boundary				
B.3.1. Does the project boundary include -physical, geographical site where the wastewater and sludge treatment takes place in baseline and project situation; does it cover al facilities affected by the project activity including sites where the processing, transportation and application or disposal of waste products as well as biogas takes place (**AMS III.H**)? -the physical, geographical site where a) the wastewater treatment would have taken place and the methane emission occurred in absence of the project activity, b) the wastewater treatment takes	1,2	2 flow diagrams in B.3. illustrate the project boundaries for the first and the second stage of the proposed project activity. There is a sludge treatment in the second stage of the project (liquid sludge passes through a boiler, then tri-decanter and is after then separated in oil, water and solid sludge), however for this sludge treatment no CERs are claimed, thus neither baseline nor project emissions for this sludge treatment are considered. In the first stage of the project, no sludge is expected due to constant homogenization of the wastewater in the biodigesters through pumps.	**CAR** **CR**	þ

	place in the project activity, c) the sludge is treated and disposed off in the baseline and project situation (**AMS III.I**)? -the physical, geographical site of the renewable generation source (**AMS I.D**)?		**Corrective Action Request No.8.** 1. There is no sludge for land application in the proposed project activity (according to information obtained during the on-site visit), but sludge will pass through a thermal treatment (in boiler, tri-decanter). Please make that clear in Figure 7 of the PDD and explain in B.3. the kind of sludge treatment to be implemented. 2. Sludge treatment should be included into the project boundary (refer to §13, AMS III.H. and §3(c), AMS III.I.). 3. Please make clear in the project boundary diagrams which of the lagoons are aerated lagoons. 4. Regarding the 2nd stage: The 3 aerobic aerated lagoons after the physical-chemical flotation system are serial. Please correct. **Clarification Request No. 5.** The environmental control plan, page 10 (IRL 7) mentions the "annual cleaning of the septic tank (about 2 tons/year of sludge)". What the sludge will be used for and how the same will be monitored (end use of final sludge)? Please clarify.		
B.3.2.	Does the presentation of the project activity clearly indicate and justify which sections of the treatment system will be affected and which will remain unaf-	1,2	**Corrective Action Request No.9.** In chapter B.3. it should be clearly explained which parts of the treatment system will be affected and which not. According to §14	**CAR**	**þ**

fected respectively **(AMS III.H)**?		of AMS III.H., "the assessment and identification of the systems affected by the project activity will be undertaken ex ante, and the PDD shall justify the exclusion of sections or components of the system".		
B.3.3. Has the assessment and identification of the systems affected by the project activity be undertaken *ex ante* **(AMS III.H)**?	1,2	Yes, however see B.3.2.	**See CAR**	**þ**
B.3.4. In case of project activities covered under paragraph 2 (b) and (c), in case the project activity involves bottling of biogas Does the project boundary includes the upgrade and compression installations, the dedicated piped network/natural gas distribution grid for distribution of biogas from the wastewater treatment plant to the end user sites and all the facilities and devices connected directly to it **(AMS III.H)**?	1,2	Not applicable	**þ**	**þ**
B.3.5. Do the spatial and technological boundaries as verified on-site comply with the discussion provided by / indication included to the PDD?	1,2	See B.3.1.	**þ**	**þ**
B.4. Details of baseline and its development				
B.4.1. Have all technically feasible baseline scenario alternatives to the project activity been identified and discussed by the PDD? Why can this list be considered as being complete?	1,2	**Corrective Action Request No.10.** 1. The baseline scenarios according to AMS III.H, AMS III.I and AMS I.D. have to be clearly explained in B.4. of the PDD including all baseline scenario alternatives in the case if applicable. The baseline scenario should consider the increase of the wastewater inflow due to plant production capacity increase (see for this "Indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories" version 12.1	**CAR**	**þ**

			(EB50), paragraph 16 and the application of the most recent version of the Combined Tool). 2. It should be evidenced that open anaerobic lagoon systems are the baseline scenario in the Host Country/region where the proposed project activity is located.		
B.4.2.	Does the project identify correctly and excludes those options not in line with regulatory or legal requirements?	1,2	See B.4.1.	**See CAR**	**þ**
B.4.3.	Have applicable regulatory or legal requirements been identified?	1,2	According to Brazilian regulation and laws, there is no obligation at LAR Agroindustries to change the wastewater treatment from anaerobic to aerobic treatment nor to recover the generated biogas during anaerobic degradation of wastewater, nor to use that biogas as an energy source for electricity generation.	**þ**	**þ**
B.4.4.	Baseline scenario selection: Are wastewater and sludge treatment systems equipped with biogas recovery facility in the baseline situation excluded from the baseline emission calculations?	1,2	Not applicable, as there has been no biogas recovery facility in the baseline situation.	**þ**	**þ**
B.4.5.	Have all baseline emissions from the affected systems been discussed in the PDD?	1,2	Baseline emissions are discussed in B.6.1. of the PDD, however it is not explained which and why certain baseline emissions are not applicable to the proposed project activity. **Corrective Action Request No.11.** B.6.1. should explain which and why certain baseline emissions are not applicable to the proposed project activity.	**CAR**	**þ**
B.4.6.	Does the selected baseline scenario correspond to the selected project scenario as per section B.2 above?	1,2	See B.4.1.	**þ**	**þ**

B.4.7.	Is the identified baseline scenario in line with regulatory or legal requirements?	1,2	See B.4.1.	þ	þ
B.4.8.	Does the PDD identify the most likely baseline scenario in absence of the project activity?	1,2	See B.4.1.	þ	þ
B.4.9.	Is this identification supported by official and/or verifiable documents (e.g. studies, web pages, certificates, etc?	1,2	See B.4.1.	þ	þ
B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):					
B.5.1.	In case of applying step 2 / investment analysis of the additionality tool: Is the analysis method identified appropriately (step 2a)?	--	B.5.1.-B.5.12 are not applicable, as the additionality tool is not applied.	þ	þ
B.5.2.	In case of Option I (simple cost analysis): Is it demonstrated that the activity produces no economic benefits other than CDM income?	--	NA	þ	þ
B.5.3.	In case of Option II (investment comparison analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	--	NA	þ	þ
B.5.4.	In case of Option III (benchmark analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	--	NA	þ	þ
B.5.5.	In case of Option II or Option III: Is the calculation of financial figures for this indicator correctly done for all alternatives and the project activity?	--	NA	þ	þ

B.5.6.	In case of Option II or Option III: Is the analysis presented in a transparent manner including publicly available proofs for the utilized data?	--	NA	þ	þ
B.5.7.	In case of applying step 3 (barrier analysis) of the additionality tool: Is a complete list of barriers developed that prevent the different alternatives to occur?	--	NA	þ	þ
B.5.8.	In case of applying step 3 (barrier analysis): Is transparent and documented evidence provided on the existence and significance of these barriers?	--	NA	þ	þ
B.5.9.	In case of applying step 3 (barrier analysis): Is it transparently shown that the execution of at least one of the alternatives is not prevented by the identified barriers?	--	NA	þ	þ
B.5.10.	Have other activities in the host country / region similar to the project activity been identified and are these activities appropriately analyzed by the PDD (step 4a)?	--	NA	þ	þ
B.5.11.	If similar activities are occurring: Is it demonstrated that in spite of these similarities the project activity would not be implemented without the CDM component (step 4b)?	--	NA	þ	þ
B.5.12.	Is it appropriately explained how the approval of the project activity will help to overcome the economic and financial hurdles or other identified barriers (step 5)?	--	NA	þ	þ

If the additionality tool has not been used please answer B.5.13 to B.5.18				
B.5.13. If the starting date of the project activity is before the date of validation, is evidence available to prove that incentive from the CDM was seriously considered in the decision to proceed with the project activity?	1,2, 18, 19, 20, 21, 22, 40	The project´s starting date is defined as 12/02/2009 (starting date of open anaerobic lagoons covering process) in the GSP PDD. The starting date has been assessed by the validation team during the on-site visit through purchase agreements of biodigesters and generators and invoices for ground preparation work at the 1st anaerobic lagoon for the biodigester. It has been scrutinized that the first preparation works on the 1st anaerobic lagoon designated for the biodigester were in June 2008 and the first significant financial commitment dates from June 20, 2008, thus the same date should be used as project´s starting date. CDM consideration has been evidenced during the on-site visit by a Project Idea Note (IRL 18), dated 25/08/2006 and edited by various companies and institutions (Itaipu, Copel, Sanepar, LAR, IAP, LACTEC, FPTI). In this paper amongst others the proposed project activity is mentioned and a clear reference to CDM is given. It is indicated that CDM should be explored as it is an additional income source. The following documents have been presented to the validation team, in order to evidence that continuing and real actions were taken to secure CDM status: 1. Proposal AgCert about the implementation of a biogas CDM project 19/03/2007 (IRL 19) 2. Email communication between Ansberto R. do Passo Neto (LAR) and Javier Becerra Sánchez (IRL 40) 3. Letter of Intent signed by LAR about CDM consulting services and CER purchase 12/08/2008 (IRL 20) 4. Emission reduction Purchase Agreement (ERPA) 25/09/2008 (IRL 21) 5. Stakeholder process 19/02/2009 (IRL 22)	**CAR**	**þ**

		Corrective Action Request No.12. 1. The project´s starting date should be modified to June 20, 2008 as on this date the first significant financial commitment (due to first ground preparation works) took place. 2. The evidence of CDM consideration (IRL 18) should be submitted in its most important parts in English language to the validation team. 3. B.5. of the PDD should include an explanation (including a timetable) how CDM was considered and indicate actions to evidence that continuing and real actions were taken to secure CDM status.		
B.5.14. Does an implementation timeline of the proposed project activity clearly indicate the date of the investment decision, start of the construction works, start of the commissioning, start-up? Please indicate the timeline of the project here.	1,2	**Corrective Action Request No.13.** An implementation timeline of the proposed project activity should be included into the PDD indicating date of the investment decision, start of the construction works, start of commissioning, start up.	**CAR**	**þ**
B.5.15. Has a timeline of events and actions which have been taken to achieve CDM registration been described in the PDD and which evidence has been delivered?	1,2, 18, 19, 20, 21, 22, 40	See B.5.13. The respective evidences have been submitted to the validation team and are mentioned in B.5.13.	**See CAR**	**þ**
B.5.16. Is a complete list of barriers developed that prevents the project activity to occur?	1,2	Yes. Access to finance barrier, barrier due to prevailing practice and other barriers are mentioned in B.5. of the PDD.		
B.5.17. Does this list include at least one of the			**See**	**þ**

following barriers?		<table><tr><th>Barrier</th><th>Discussed?</th><th>Verifiable?</th></tr><tr><td>Investment</td><td>Yes</td><td>See CAR in B.5.19.</td></tr><tr><td>Technological</td><td>No</td><td>NA</td></tr><tr><td>Due to prevailing practice</td><td>Yes</td><td>See CAR in B.5.19.</td></tr><tr><td>Other</td><td>Yes</td><td>See CAR in B.5.19.</td></tr></table>	**CAR in B.5.19.**	
B.5.18. Does the discussion sufficiently take into account relevant national and/or sectoral policies?	1,2	Yes it does. There are neither regulations in Brazil for methane recovery from anaerobic degradation nor for switching open anaerobic lagoons into aerated systems in order to avoid methane emissions. Besides, there is no obligation to generate electricity from biogas.	**þ**	**þ**
B.5.19. Is transparent and documented evidence provided on the existence and significance of these barriers?	1,2	**Corrective Action Request No.14.** 1. Concrete evidences for barriers presented in the PDD should be presented to the validation team, in order to verify the barriers presented in the PDD. Besides, the most important evidences have to be submitted to the CDM-EB. 2. The additionality discussion should consider the increase in wastewater flow due to the planned capacity increase.	**CAR**	**þ**
B.5.20. Is it appropriately explained how the approval of the project activity will help to overcome the identified barriers?	1,2	Yes. B.5. informs that “in the absence of the CDM additional revenues, the project owner would have no motivation from the financial point of view to risk their own funds, to digress from their business and to face such a project, completely new for Cooperativa Lar, nor to change the existing wastewater treatment at their unit for chicken. Moreover, since the current wastewater treatment is complying with all the Brazilian regulation regarding this field, Cooperativa Lar would not have got involved in such a kind of project unless there was not a commitment with mitigation of	**CAR**	**þ**

		climate change and with the reduction of GHG emissions to the atmosphere." **Corrective Action Request No.15.** The text above should be revised as some change in the existing wastewater treatment would be necessary in the absence of the proposed project activity due to the increase of wastewater flow.		
B.6. Emissions reductions				
B.6.1. *Explanation of methodological choices*				
B.6.1.1. Is it explained how the procedures provided in the methodology are applied by the proposed project activity?	1,2,4,5,6	Procedures provided in the methodologies AMS III.H, AMS III.I and AMS I.D to calculate project emissions are not provided. **Corrective Action Request No.16.** Procedures provided in the methodologies AMS III.H, AMS III.I and AMS I.D to calculate project emissions should be clearly indicated in B.6.1. of the PDD.	**CAR**	**þ**
B.6.1.2. Is every selection of options offered by the methodology correctly justified and is this justification in line with the situation verified on-site?	1,2,4,5,6	**Corrective Action Request No.17.** 1. The selection of options should be justified both for baseline and project emissions. It should be clearly explained in B.6.1. why certain baseline and/or project emissions are applicable to the proposed project activity and others not applicable to the proposed project activity. 2. It is not the Simple Adjusted Operating Margin which is used for the calculation of the emissions factor (operating margin) but the Dispatch Data Analysis Please correct. 3. The emissions factor will be applied ex-post and not ex-ante as described in B.6.1. of the PDD. Please correct.	**CAR**	**þ**
B.6.1.3. Determination of baseline and project emissions according to AMS III.H (Comment on any line answered "No")				
B.6.1.3.1. Component 1: Baseline emissions from electricity or	1,2,5	Baseline emission checklist | Yes / No	**CAR**	**þ**

fuel consumption in year y (tCO2e) as per the procedures described in AMS I.D. [$BE_{power, y}$]		Component discussed in the PDD? No Formulae correctly applied? No **Corrective Action Request No.18.** The formula for baseline emissions from electricity/fuel consumption should be included in chapter B.6.1.		
B.6.1.3.2. Component 2: Baseline emissions of the wastewater treatment systems affected by the project activity in the year y (tCO2e) [$BE_{ww,treatment,y}$]	1,2,5	Baseline emission checklist: Yes / No Component discussed in the PDD? Yes Formulae correctly applied? Yes	**þ**	**þ**
B.6.1.3.3. Component 3: Baseline emissions of the sludge treatment systems affected by the project activity in year y (tCO2e) [$BE_{s,treatment,y}$]	1,2,5	Baseline emission checklist: Yes / No Component discussed in the PDD? Yes Formulae correctly applied? Yes	**þ**	**þ**
B.6.1.3.4. Component 4: Baseline methane emissions from degradable organic carbon in treated wastewater discharged into sea/river/lake in year y (tCO2e). The value of this term is zero for the case 1 (ii) [$BE_{ww,discharge,y}$]	1,2,5	Baseline emission checklist: Yes / No Component discussed in the PDD? Yes Formulae correctly applied? Yes	**þ**	**þ**
B.6.1.3.5. Component 5: Baseline methane emissions from anaerobic decay of the final sludge produced in year y (tCO2e). If the sludge is controlled combusted, disposed in a landfill with biogas recovery, or used for soil application in the baseline scenario, this term shall be neglected. [$BE_{s,final,y}$]	1,2,5	Baseline emission checklist: Yes / No Component discussed in the PDD? Yes Formulae correctly applied? Yes	**þ**	**þ**
B.6.1.3.6. Component 6:	1,2,5		**See CAR**	**þ**

Emissions from electricity or fuel consumption in the year y (tCO2e) [$PE_{power, y}$]		Project emission checklist: Component discussed in the PDD? — See B.6.1.1. and B.6.1.2.; Formulae correctly applied? — See B.6.1.1. and B.6.1.2.		
B.6.1.3.7. Component 7: Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery, in year y (tCO2e) [$PE_{ww, treatment, y}$]	1,2,5	Project emission checklist: Component discussed in the PDD? — See B.6.1.1. and B.6.1.2.; Formulae correctly applied? — See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.8. Component 8: Methane emissions from sludge treatment systems affected by the project activity, and not equipped with biogas recovery, in year y (tCO2e) [$PE_{s, treatment, y}$]	1,2,5	Project emission checklist: Component discussed in the PDD? — See B.6.1.1. and B.6.1.2.; Formulae correctly applied? — See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.9. Component 9: Methane emissions from degradable organic carbon in treated wastewater in year y (tCO2e) [$PE_{ww, discharge, y}$]	1,2,5	Project emission checklist: Component discussed in the PDD? — See B.6.1.1. and B.6.1.2.; Formulae correctly applied? — See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.10. Component 10: Methane emissions from anaerobic decay of the final sludge produced in year y (tCO2e) [$PE_{s, final, y}$]	1,2,5	Project emission checklist: Component discussed in the PDD? — See B.6.1.1. and B.6.1.2.; Formulae correctly applied? — See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.11. Component 11:	1,2,5		**See**	**þ**

Methane emissions from biogas release in capture systems in year y (tCO2e) [$PE_{fugitive, y}$]		Project emission checklist: Yes / No Component discussed in the PDD? See B.6.1.1. and B.6.1.2. Formulae correctly applied? See B.6.1.1. and B.6.1.2.	**CAR**	
B.6.1.3.12. Component 12: Methane emissions due to incomplete flaring in year y (tCO2e) [$PE_{flaring, y}$]	1,2,5	Project emission checklist: Yes / No Component discussed in the PDD? See B.6.1.1. and B.6.1.2. Formulae correctly applied? See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.13. Component 13: Methane emissions from biomass stored under anaerobic conditions which does not take place in the baseline situation (tCO2e) [$PE_{biomass, y}$]	1,2,5	Project emission checklist: Yes / No Component discussed in the PDD? See B.6.1.1. and B.6.1.2. Formulae correctly applied? See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.14. Component 14: Fugitive emission through capture inefficiencies in the anaerobic wastewater treatment systems in the year y (tCO2e) [$PE_{fugitive, ww, y}$]	1,2,5	Project emission checklist: Yes / No Component discussed in the PDD? See B.6.1.1. and B.6.1.2. Formulae correctly applied? See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.15. Component 15: Fugitive emissions through capture inefficiencies in the anaerobic sludge treatment systems in the year y (tCO2e) [$PE_{fugitive, s, y}$]	1,2,5	Project emission checklist: Yes / No Component discussed in the PDD? See B.6.1.1. and B.6.1.2. Formulae correctly applied? See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.16. Component 16: In case of project activities covered under	1,2,5	Project emission checklist: Yes / No	**See CAR**	**þ**

paragraph 2 (b) and 2 (c) Project emissions related to the upgrading and compression of the biogas in year y (tCO2e) [$PE_{process, y}$]		Component discussed in the PDD? — See B.6.1.1. and B.6.1.2. Formulae correctly applied? — See B.6.1.1. and B.6.1.2.		
B.6.1.3.17. Component 17: In case of project activities covered under paragraph 2 (b) and 2 (c) Emissions from methane contained in wastewater discharge of water wash up-grading installation in year y (tCO2e); [$PE_{ww, upgrade, y}$]	1,2,5	Project emission checklist — Yes / No Component discussed in the PDD? — See B.6.1.1. and B.6.1.2. Formulae correctly applied? — See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.18. Component 18: In case of project activities covered under paragraph 2 (b) and 2 (c) Emissions from compressor leaks in year y (tCO2e) [$PE_{CH4, equip, y}$]	1,2,5	Project emission checklist — Yes / No Component discussed in the PDD? — See B.6.1.1. and B.6.1.2. Formulae correctly applied? — See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.19. Component 19: In case of project activities covered under paragraph 2 (b) and 2 (c) Emissions from venting gases retained in water wash upgrading equipment in year y (tCO2e) [$PE_{ventgas, y}$]	1,2,5	Project emission checklist — Yes / No Component discussed in the PDD? — See B.6.1.1. and B.6.1.2. Formulae correctly applied? — See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.20. Component 20: In case of project activities covered under paragraph 2 (c ii)	1,2,5	Project emission checklist — Yes / No Component discussed in the PDD? — See B.6.1.1. and	**See CAR**	**þ**

Emissions due to physical leakage from the dedicated piped network in year y (tCO2e) [$PE_{leakage, pipeline, y}$]		B.6.1.2. Formulae correctly applied? See B.6.1.1. and B.6.1.2.		
B.6.1.3.21. Component 21: In case of project activities covered under paragraph 2 (b) Leakage emissions project activities involving bottling of biogas in year y (tCO2e) [$LE_{bottling, y}$]	1,2,5	Project emission checklist: Yes / No Component discussed in the PDD? See B.6.1.1. and B.6.1.2. Formulae correctly applied? See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.22. Component 22: In case of project activities covered under paragraph 2 (b) Emissions due to physical leakage from biogas bottles in year y (tCO2e) [$LE_{leakage, bb, y}$]	1,2,5	Project emission checklist: Yes / No Component discussed in the PDD? See B.6.1.1. and B.6.1.2. Formulae correctly applied? See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.3.23. Component 23: In case of project activities covered under paragraph 2 (b) Emissions due to fossil fuel use for transportation of bottles; biogas filled bottles to the end users and the return of empty bottles to the filling site in year y (tCO2e) [$LE_{trans, y}$]	1,2,5	Project emission checklist: Yes / No Component discussed in the PDD? See B.6.1.1. and B.6.1.2. Formulae correctly applied? See B.6.1.1. and B.6.1.2.	**See CAR**	**þ**
B.6.1.4. Determination of baseline and project emissions according to AMS III.I (Comment on any line answered "No")				
B.6.1.4.1. Component 1: Methane produced in the anaerobic baseline wastewater treatment system(s) that is/are being replaced with the biological aerobic system(s) **(BEww,treatment,y)**	1,2,6	Baseline emission checklist: Yes / No Component discussed in the PDD? Yes Formulae correctly applied? Yes	**þ**	**þ**

B.6.1.4.2. Component 2: Methane emissions on account of inefficiencies in the baseline wastewater treatment systems and presence of degradable organic carbon in the treated wastewater discharged into river/lake/sea etc. **(BEww,discharge,y)**	1,2,6	Baseline emission checklist: Yes / No Component discussed in the PDD? Yes Formulae correctly applied? Yes	**þ**	**þ**
B.6.1.4.3. Component 3: Methane produced in the baseline sludge treatment systems(s) **(BEs,treatment,y)**	1,2,6	Baseline emission checklist: Yes / No Component discussed in the PDD? Yes Formulae correctly applied? Yes	**þ**	**þ**
B.6.1.4.4. Component 4: Methane emissions from anaerobic decay of the final sludge produced in the baseline situation. If the sludge is controlled combusted, disposed in a landfill with biogas recovery, or used for soil application in the baseline scenario, this term shall be neglected. **(BEs,final,y)**	1,2,6	Baseline emission checklist: Yes / No Component discussed in the PDD? Yes Formulae correctly applied? Yes	**þ**	**þ**
B.6.1.4.5. Component 5: CO2 emissions related to the power and fossil fuel (refers also to AMS I.D) used by the project activity facilities. Emission factors for grid electricity or diesel fuel use shall be calculated as described in category I.D. **(PEpower,y)**	1,2,4,6	Project emission checklist: Yes / No Component discussed in the PDD? See B.6.1.1 and B.6.1.2. Formulae correctly applied? See B.6.1.1 and B.6.1.2.	**See CAR**	**þ**
B.6.1.4.6. Component 6: Methane emissions during the treatment of the wastewater in biological aerobic waste-	1,2,6	Project emission checklist: Yes / No Component discussed in the PDD? See B.6.1.1 and	**See CAR**	**þ**

water treatment systems **(PEww,treatment,y)**		B.6.1.2. Formulae correctly applied? — See B.6.1.1 and B.6.1.2.		
B.6.1.4.7. Component 7: Methane emission from degradable organic carbon in treated wastewater discharged in sea/river or lake **(PEww,discharge,y)**	1,2,6	Project emission checklist — Yes / No Component discussed in the PDD? — See B.6.1.1 and B.6.1.2. Formulae correctly applied? — See B.6.1.1 and B.6.1.2.	**See CAR**	**þ**
B.6.1.4.8. Component 8: Methane emissions from sludge treatment in the project activity **(PEs,i,y)**	1,2,6	Project emission checklist — Yes / No Component discussed in the PDD? — See B.6.1.1 and B.6.1.2. Formulae correctly applied? — See B.6.1.1 and B.6.1.2.	**See CAR**	**þ**
B.6.1.4.9. Component 9: Methane emissions from the decay of the final sludge generated by the project activity, if the sludge is disposed to decay anaerobically in a landfill without methane recovery **(PEs,final,y).**	1,2,6	Project emission checklist — Yes / No Component discussed in the PDD? — See B.6.1.1 and B.6.1.2. Formulae correctly applied? — See B.6.1.1 and B.6.1.2.	**See CAR**	**þ**
B.6.1.5. Are the formulae required for the determination of baseline emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1,2,6	Yes.	**þ**	**þ**
B.6.1.6. Are the formulae required for the determination of project emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1,2,6	Yes.	**þ**	**þ**

B.6.1.7. Are the formulae required for the determination of leakage emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1,2,6	Since there is no transfer of equipment associated to the proposed project activity, leakage can be considered equal to zero. This is mentioned in B.6.3. of the PDD.	**þ**	**þ**
B.6.1.8. Are the formulae required for the determination of emission reductions correctly presented?	1,2,6	**Corrective Action Request No.19.** The formulae required for the determination of emission reductions should be indicated in B.6.1. of the PDD.	**CAR**	**þ**
B.6.2. *Data and parameters that are available at validation*				
B.6.2.1. Is the list of parameters presented in chapter B.6.2 considered to be complete with regard to the requirements of the applied methodology?	1,2,4,5,6	**Corrective Action Request No.20.** The following parameters including its specifications should be included into B.6.2. of the PDD: 1. $COD_{removed, i, y}$ COD removed by baseline treatment system i in year y 2. COD removal efficiency (according to §20, AMS III.H, the removal efficiency of the baseline systems should be measured ex ante using historical records of COD removal efficiency of at least one year prior to the project implementation or through representative measurement campaign.) 3. UF_{BL} Model correction factor to account for model uncertainties 4. Volume of treated wastewater discharged in baseline situation in year y (m^3) 5. $COD_{ww, discharge, BL, y}$ COD of the treated wastewater discharged into sea, river or lake in the baseline situation in the year y (tonnes/m^3) 6. UF_{PJ} Model correction factor to account for model uncertainties in project situation 7. $MCF_{ww, treatment, PJ, k}$ Methane correction factor for project wastewater treatment system k (MCF values as per table III.H.1) 8. $MCF_{ww, PJ, discharge}$ Methane correction factor based on discharge	**CAR**	**þ**

		pathway in the project situation (e.g. into sea, river or lake) of the wastewater (fraction) (MCF values as per table III.H.1) 9. Methane correction factor for the aerobic wastewater treatment system k (MCF vale for well managed aerobic biological systems, or for poorly managed or overloaded systems as per table III.I.1 shall be taken.		
B.6.2.2. Comment on any line answered with "No"				
B.6.2.2.1. Parameter Title: Volume of wastewater treated in baseline wastewater treatment system i in year y (m^3)	1,2,5,6	**Corrective Action Request No.21.** The parameter "Volume of wastewater treated in baseline waste-water treatment system i in year y (m^3)" refers to the wastewater treated in the baseline system. Title, description, choice of data/measurement method and value should be revised. Data Checklist / Yes / No / NA Title in line with methodology? No Data unit correctly expressed? Yes Appropriate description of parameter? No Source clearly referenced? Yes Correct value provided? No Has this value been verified? Yes Choice of data correctly justified? No Measurement method correctly described? No	**CAR**	**þ**
B.6.2.2.2. Parameter Title: $COD_{removed, i, y}$ COD removed by baseline treatment system i in year y (tonnes/m^3) Note: $COD_{removed, i, y}$ = inflow COD – outflow COD	1,2,5,6	See B.6.2.1. Data Checklist / Yes / No / NA Title in line with methodology? No Data unit correctly expressed? No Appropriate description of parameter? No Source clearly referenced? No	**See CAR**	**þ**

		Correct value provided? — No Has this value been verified? — No Choice of data correctly justified? — No Measurement method correctly described? — No		
B.6.2.2.3. Parameter Title: Inflow COD in the baseline treatment system i in year y (tonnes/m^3)	1,2,5,6	**Corrective Action Request No.22.** The inflow COD should refer to the baseline system, thus title, description, value, choice of data/measurement method should be revised. Regarding the value, historical records of at least one year prior to the project implementation shall be used (see §17 AMS III.H and §5 AMS III.I). The COD samples of wastewater taken at different point of the wastewater treatment system (IRL 32) which were presented during the on-site visit, can be used for this purpose. Data Checklist — Yes / No / NA Title in line with methodology? — No Data unit correctly expressed? — Yes Appropriate description of parameter? — No Source clearly referenced? — Yes Correct value provided? — No Has this value been verified? — Yes Choice of data correctly justified? — No Measurement method correctly described? — No	**CAR**	**þ**
B.6.2.2.4. Parameter Title: Outflow COD in the baseline treatment system i in year y (tonnes/m^3)	1,2,5,6	**Corrective Action Request No.23.** The outflow COD should refer to the baseline system, thus title, description, value, choice of data/measurement method should be revised. Regarding the value, historical records of at least one	**CAR**	**þ**

<table>
<tr>
<td></td>
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<td>year prior to the project implementation shall be used (see §17 AMS III.H and §5 AMS III.I). The COD samples of wastewater taken at different point of the wastewater treatment system (IRL 32) which were presented during the on-site visit, can be used for this purpose.

<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Title in line with methodology?</td><td>No</td></tr>
<tr><td>Data unit correctly expressed?</td><td>Yes</td></tr>
<tr><td>Appropriate description of parameter?</td><td>No</td></tr>
<tr><td>Source clearly referenced?</td><td>Yes</td></tr>
<tr><td>Correct value provided?</td><td>No</td></tr>
<tr><td>Has this value been verified?</td><td>Yes</td></tr>
<tr><td>Choice of data correctly justified?</td><td>No</td></tr>
<tr><td>Measurement method correctly described?</td><td>No</td></tr>
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<tr>
<td>B.6.2.2.5. Parameter Title:
COD removal efficiency (AMS III.H and AMS III.I)</td>
<td>1,2,5,6</td>
<td>See B.6.2.1.
<table>
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<tr><td>Has this value been verified?</td><td>No</td></tr>
<tr><td>Choice of data correctly justified?</td><td>No</td></tr>
<tr><td>Measurement method correctly described?</td><td>No</td></tr>
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<td>See CAR</td>
<td>þ</td>
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<tr>
<td>B.6.2.2.6. Parameter Title:</td>
<td>1,2,5</td>
<td>Power/Electricity and fuel consumption will be monitored, thus</td>
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<tr>
<td>power /electricity and fuel consumption per m3 of wastewater treated (AMS III.H and AMS III.I)</td>
<td>,6</td>
<td>here not applicable.
<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
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<td>B.6.2.2.7. Parameter Title:
amount of final sludge generated per tonne of COD treated (AMS III.H and AMS III.I)</td>
<td>1,2,5 ,6</td>
<td>Not applicable
<table>
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<tr><td>Data unit correctly expressed?</td><td>NA</td></tr>
<tr><td>Appropriate description of parameter?</td><td>NA</td></tr>
<tr><td>Source clearly referenced?</td><td>NA</td></tr>
<tr><td>Correct value provided?</td><td>NA</td></tr>
<tr><td>Has this value been verified?</td><td>NA</td></tr>
<tr><td>Choice of data correctly justified?</td><td>NA</td></tr>
<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
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</tr>
<tr>
<td>B.6.2.2.8. Parameter Title:
Emissions factor for fossil fuel combustion and/or grid electricity consumption</td>
<td>1,2,4 ,5,6</td>
<td>The emissions factor for grid electricity consumption will be applied ex-post, thus here not applicable.
According to the information provided during the on-site visit, no fossil fuels will be combusted, however, page 30 of the Environmental Control Plan mentions diesel oil consumption in heater and combustion equipment.
<u>Clarification Request No. 6.</u>
Please clarify whether the proposed project activity involves the consumption of diesel fuel oil or any other fossil fuel (amongst others for sludge treatment) and include the respective parameters into B.6.2. and B.7.1. if this was the case. The calculation</td>
<td>CR</td>
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<table>
<tr><td></td><td></td><td>steps should be indicated if fossil fuel is really consumed.
<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>See CR 5</td></tr><tr><td>Data unit correctly expressed?</td><td>See CR 5</td></tr><tr><td>Appropriate description of parameter?</td><td>See CR 5</td></tr><tr><td>Source clearly referenced?</td><td>See CR 5</td></tr><tr><td>Correct value provided?</td><td>See CR 5</td></tr><tr><td>Has this value been verified?</td><td>See CR 5</td></tr><tr><td>Choice of data correctly justified?</td><td>See CR 5</td></tr><tr><td>Measurement method correctly described?</td><td>See CR 5</td></tr></table></td><td></td><td></td></tr>
<tr><td>B.6.2.2.9. Parameter Title:
$MCF_{ww, treatment, BL, i}$ Methane correction factor for baseline wastewater treatment system i (MCF values as per table III.H.1)</td><td>1,2,5,6</td><td><u>Corrective Action Request No.24.</u>
Regarding the parameter “$MCF_{ww, treatment, BL, i}$ Methane correction factor for baseline wastewater treatment system i”: It should be clearly indicated which value has been finally applied for the estimation of baseline emissions. The choice of data has to be justified.
<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table></td><td>CAR</td><td>þ</td></tr>
<tr><td>B.6.2.2.10. Parameter Title:
$B_{o, ww}$ Methane producing capacity of the wastewater (AMS III.H and AMS III.I)</td><td>1,2,5,6</td><td><table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr></table></td><td>þ</td><td>þ</td></tr>
</table>

		Appropriate description of parameter? — Yes Source clearly referenced? — Yes Correct value provided? — Yes Has this value been verified? — Yes Choice of data correctly justified? — Yes Measurement method correctly described? — NA		
B.6.2.2.11. Parameter Title: UF_{BL} Model correction factor to account for model uncertainties (**AMS III.H and AMS III.I)**	1,2,5,6	See B.6.2.1. Data Checklist — Yes / No / NA Title in line with methodology? — No Data unit correctly expressed? — NA Appropriate description of parameter? — No Source clearly referenced? — No Correct value provided? — No Has this value been verified? — No Choice of data correctly justified? — No Measurement method correctly described? — NA	**See CAR**	**þ**
B.6.2.2.12. Parameter Title: GWP_{CH4} Global Warming Potential for methane (**AMS III.H and AMS III.I)**	1,2,5,6	**Corrective Action Request No.25.** Regarding the parameter "Global Warming Potential for methane": the source should be corrected and refer to the IPCC 2006 guidelines. Data Checklist — Yes / No / NA Title in line with methodology? — Yes Data unit correctly expressed? — NA Appropriate description of parameter? — Yes Source clearly referenced? — No Correct value provided? — Yes	**CAR**	**þ**

		Has this value been verified? — Yes Choice of data correctly justified? — Yes Measurement method correctly described? — NA		
B.6.2.2.13. Parameter Title: $Sj_{, BL, y}$ Amount of dry matter in the sludge that would have been treated by the sludge treatment system j in the baseline scenario (tonne) **(AMS III.H and AMS III.I)**	1,2,5,6	Not applicable, as neither baseline nor project emissions from sludge treatment are considered for the proposed project activity. Data Checklist — Yes / No / NA Title in line with methodology? — NA Data unit correctly expressed? — NA Appropriate description of parameter? — NA Source clearly referenced? — NA Correct value provided? — NA Has this value been verified? — NA Choice of data correctly justified? — NA Measurement method correctly described? — NA	þ	þ
B.6.2.2.14. Parameter Title: DOC_s Degradable organic content of the untreated sludge generated in the year y **(AMS III.H and AMS III.I)**	1,2,5,6	Not applicable Data Checklist — Yes / No / NA Title in line with methodology? — NA Data unit correctly expressed? — NA Appropriate description of parameter? — NA Source clearly referenced? — NA Correct value provided? — NA Has this value been verified? — NA Choice of data correctly justified? — NA Measurement method correctly described? — NA	þ	þ

B.6.2.2.15. Parameter Title: $MCF_{s,treatment, BL, y}$ Methane correction factor for baseline sludge treatment system j (MCF values as per table III.H.1 and as per table III.I.1) **(AMS III.H and AMS III.I)**	1,2,5,6	<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>	**þ**	**þ**
B.6.2.2.16. Parameter Title: DOC_F Fraction of DOC dissimilated to bio-gas **(AMS III.H and AMS III.I)**	1,2,5,6	Not applicable <table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>	**þ**	**þ**
B.6.2.2.17. Parameter Title: F Fraction of CH_4 in biogas **(AMS III.H and AMS III.I)**	1,2,5,6	**Corrective Action Request No.26.** The parameter F (Fraction of CH4 in biogas) should be taken out from B.6.2. of the PDD, as not applicable. <table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr></table>	**CAR**	**þ**

		Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided? NA Has this value been verified? NA Choice of data correctly justified? NA Measurement method correctly described? NA		
B.6.2.2.18. Parameter Title: $EF_{composting}$ Emission factor for composting of organic waste **(AMS III.H and AMS III.I)**	1,2,5,6	Not applicable. Data Checklist / Yes / No / NA Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided? NA Has this value been verified? NA Choice of data correctly justified? NA Measurement method correctly described? NA	þ	þ
B.6.2.2.19. Parameter Title SGR_{BL} Sludge generation ratio of the wastewater treatment plant in the baseline scenario **(AMS III.H and AMS III.I)**	1,2,5,6	Not applicable Data Checklist / Yes / No / NA Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided? NA Has this value been verified? NA Choice of data correctly justified? NA Measurement method correctly described? NA	þ	þ

B.6.2.2.20. Parameter Title Qww,y Volume of treated wastewater discharged in baseline situation in year y (m^3) **(AMS III.H and AMS III.I)**	1,2,5,6	See B.6.2.1. Data Checklist / Yes / No / NA Title in line with methodology? No Data unit correctly expressed? No Appropriate description of parameter? No Source clearly referenced? No Correct value provided? No Has this value been verified? No Choice of data correctly justified? No Measurement method correctly described? No	**See CAR**	**þ**
B.6.2.2.21. Parameter Title $COD_{ww, discharge, BL, y}$ COD of the treated wastewater discharged into sea, river or lake in the baseline situation in the year y (tonnes/m^3) **(AMS III.H and AMS III.I)**	1,2,5,6	See B.6.2.1. Data Checklist / Yes / No / NA Title in line with methodology? No Data unit correctly expressed? No Appropriate description of parameter? No Source clearly referenced? No Correct value provided? No Has this value been verified? No Choice of data correctly justified? No Measurement method correctly described? No	**See CAR**	**þ**
B.6.2.2.22. Parameter Title $MCF_{ww, BL, discharge}$ Methane correction factor based on discharge pathway in the base-	1,2,5,6	**Corrective Action Request No.27.** Regarding the parameter "$MCF_{ww, BL, discharge}$ Methane correction factor based on discharge pathway in the baseline situation (e.g.	**CAR**	**þ**

<table>
<tr>
<td>line situation (e.g. into sea, river or lake) of the wastewater (fraction) (MCF values as per table III.H.1 and as per table III.I.1) (AMS III.H and AMS III.I).</td>
<td></td>
<td>into sea, river or lake) of the wastewater (fraction): It should be clearly mentioned which value is used for which case (which methodology).
<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Title in line with methodology?</td><td>Yes</td></tr>
<tr><td>Data unit correctly expressed?</td><td>NA</td></tr>
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<tr><td>Source clearly referenced?</td><td>Yes</td></tr>
<tr><td>Correct value provided?</td><td>No</td></tr>
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<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
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<tr>
<td>B.6.2.2.23. Parameter Title $S_{final, BL, y}$ Amount of dry matter in final sludge generated by the baseline wastewater treatment systems in the year y (tonne) (AMS III.H and AMS III.I)</td>
<td>1,2,5,6</td>
<td>Not applicable
<table>
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<tr><td>Choice of data correctly justified?</td><td>NA</td></tr>
<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
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<tr>
<td>B.6.2.2.24. Parameter Title $MCF_{s, BL, final}$ Methane correction factor of the disposal site that receives the final sludge in the baseline situation MCF values</td>
<td>1,2,5,6</td>
<td>Not applicable
<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Title in line with methodology?</td><td>NA</td></tr>
<tr><td>Data unit correctly expressed?</td><td>NA</td></tr>
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estimated as per the procedures described in AMS-III.G **(AMS III.H and AMS III.I)**		Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided? NA Has this value been verified? NA Choice of data correctly justified? NA Measurement method correctly described? NA		
B.6.2.2.25. Parameter Title UF_{PJ} Model correction factor to account for model uncertainties in project situation **(AMS III.H and AMS III.I)**	1,2,5,6	See B.6.2.1. Data Checklist / Yes / No / NA Title in line with methodology? No Data unit correctly expressed? No Appropriate description of parameter? No Source clearly referenced? No Correct value provided? No Has this value been verified? No Choice of data correctly justified? No Measurement method correctly described? No	**See CAR**	þ
B.6.2.2.26. Parameter Title $MCF_{ww, treatment, PJ, k}$ Methane correction factor for project wastewater treatment system k (MCF values as per table **III.H.1**)	1,2,5,6	See B.6.2.1. Data Checklist / Yes / No / NA Title in line with methodology? No Data unit correctly expressed? No Appropriate description of parameter? No Source clearly referenced? No Correct value provided? No Has this value been verified? No Choice of data correctly justified? No Measurement method correctly described? No	**See CAR**	þ

B.6.2.2.27. Parameter Title $MCF_{s, treatment, PJ, l}$ Methane correction factor for project sludge treatment system l (MCF values as per table **III.H.1** and as per table **III.I.1**)		Not applicable Data Checklist / Yes / No / NA Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided? NA Has this value been verified? NA Choice of data correctly justified? NA Measurement method correctly described? NA	**þ**	**þ**
B.6.2.2.28. Parameter Title $MCF_{ww, PJ, discharge}$ Methane correction factor based on discharge pathway in the project situation (e.g. into sea, river or lake) of the wastewater (fraction) (MCF values as per table III.H.1)**(AMS III.H and AMS III.I)**	1,2,5,6	See B.6.2.1. Data Checklist / Yes / No / NA Title in line with methodology? No Data unit correctly expressed? No Appropriate description of parameter? No Source clearly referenced? No Correct value provided? No Has this value been verified? No Choice of data correctly justified? No Measurement method correctly described? No	**See CAR**	**þ**
B.6.2.2.29. Parameter Title $MCF_{s, PJ, final}$ Methane correction factor of the disposal site that receives the final	1,2,5	Not applicable Data Checklist / Yes / No / NA Title in line with methodology? NA	**þ**	**þ**

sludge in the project situation, MCF values estimated as per the procedures described in AMS-III.G		Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided? NA Has this value been verified? NA Choice of data correctly justified? NA Measurement method correctly described? NA		
B.6.2.2.30. Parameter Title CFE_{ww} Captured efficiency of the biogas recovery equipment in the wastewater treatment systems	1,2,5	**Corrective Action Request No.28.** Regarding the parameter "CFE_{ww} Captured efficiency of the biogas recovery equipment in the wastewater treatment systems": The description should be revised (please refer the parameter CFEww only to capture efficiency and not to flaring efficiency, as the latter one is a separate parameter. Please revise the title as per the methodology. Data Checklist: Yes / No / NA Title in line with methodology? No Data unit correctly expressed? Yes Appropriate description of parameter? No Source clearly referenced? Yes Correct value provided? Yes Has this value been verified? Yes Choice of data correctly justified? Yes Measurement method correctly described? NA	**CAR**	**þ**

<table>
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<td>B.6.2.2.31. Parameter Title:
CFE_s Captured efficiency of the biogas recovery equipment in the sludge treatment systems</td>
<td>1,2,5</td>
<td>Not applicable.
<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
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<tr><td>Data unit correctly expressed?</td><td>NA</td></tr>
<tr><td>Appropriate description of parameter?</td><td>NA</td></tr>
<tr><td>Source clearly referenced?</td><td>NA</td></tr>
<tr><td>Correct value provided?</td><td>NA</td></tr>
<tr><td>Has this value been verified?</td><td>NA</td></tr>
<tr><td>Choice of data correctly justified?</td><td>NA</td></tr>
<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
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<td>B.6.2.2.32. Parameter Title:
FE Flare efficiency in year y</td>
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<td><u>Corrective Action Request No.29.</u>
Regarding the parameter “FE Flare efficiency”: In the case the default value for the flare/combustion efficiency is applied (90%), the parameter has to be included into B.6.2., otherwise in B.7.1. The combustion efficiency of the generators should be evidenced.
<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Title in line with methodology?</td><td>No</td></tr>
<tr><td>Data unit correctly expressed?</td><td>No</td></tr>
<tr><td>Appropriate description of parameter?</td><td>No</td></tr>
<tr><td>Source clearly referenced?</td><td>No</td></tr>
<tr><td>Correct value provided?</td><td>No</td></tr>
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<tr><td>Measurement method correctly described?</td><td>No</td></tr>
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<tr>
<td>B.6.2.2.33. Parameter Title: CEF_{NG} Carbon emission factor of Natural Gas (tCO2e/TJ)</td>
<td>1,2,5</td>
<td>Not applicable
<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Title in line with methodology?</td><td>NA</td></tr>
<tr><td>Data unit correctly expressed?</td><td>NA</td></tr>
<tr><td>Appropriate description of parameter?</td><td>NA</td></tr>
<tr><td>Source clearly referenced?</td><td>NA</td></tr>
<tr><td>Correct value provided?</td><td>NA</td></tr>
<tr><td>Has this value been verified?</td><td>NA</td></tr>
<tr><td>Choice of data correctly justified?</td><td>NA</td></tr>
<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
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<tr>
<td>B.6.2.2.34. Parameter Title $NCV_{ug, y}$ Net calorific value of the upgraded biogas in year y (TJ/kg or TJ/m^3)</td>
<td>1,2,5</td>
<td>Not applicable
<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Title in line with methodology?</td><td>NA</td></tr>
<tr><td>Data unit correctly expressed?</td><td>NA</td></tr>
<tr><td>Appropriate description of parameter?</td><td>NA</td></tr>
<tr><td>Source clearly referenced?</td><td>NA</td></tr>
<tr><td>Correct value provided?</td><td>NA</td></tr>
<tr><td>Has this value been verified?</td><td>NA</td></tr>
<tr><td>Choice of data correctly justified?</td><td>NA</td></tr>
<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
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<tr>
<td>B.6.2.2.35. Parameter Title $EF_{equipment}$ Leakage rate for fugitive emissions from the compression techonogy as per specification from the compressor manufacturer in kg/hour/compressor</td>
<td>1,2,5</td>
<td>Not applicable
<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Title in line with methodology?</td><td>NA</td></tr>
<tr><td>Data unit correctly expressed?</td><td>NA</td></tr>
<tr><td>Appropriate description of parameter?</td><td>NA</td></tr>
<tr><td>Source clearly referenced?</td><td>NA</td></tr>
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		Correct value provided? NA Has this value been verified? NA Choice of data correctly justified? NA Measurement method correctly described? NA		
B.6.2.2.36. Parameter Title $LR_{pipeline}$ Physical leakage rate from the dedicated piped network	1,2,5	Not applicable Data Checklist / Yes / No / NA Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided? NA Has this value been verified? NA Choice of data correctly justified? NA Measurement method correctly described? NA	þ	þ
B.6.2.2.37. Parameter Title LR_{bb} Physical leakage rate from biogas bottles	1,2,5	Not applicable Data Checklist / Yes / No / NA Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided? NA Has this value been verified? NA Choice of data correctly justified? NA Measurement method correctly described? NA	þ	þ

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<tr>
<td>B.6.2.2.38. Parameter Title
EF_{CO2} CO_2 emission factor from fossil fuel due to transportation (tCO2/km)</td>
<td>1,2,5</td>
<td>Not applicable
<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Title in line with methodology?</td><td>NA</td></tr>
<tr><td>Data unit correctly expressed?</td><td>NA</td></tr>
<tr><td>Appropriate description of parameter?</td><td>NA</td></tr>
<tr><td>Source clearly referenced?</td><td>NA</td></tr>
<tr><td>Correct value provided?</td><td>NA</td></tr>
<tr><td>Has this value been verified?</td><td>NA</td></tr>
<tr><td>Choice of data correctly justified?</td><td>NA</td></tr>
<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
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<td>B.6.2.2.39. [AMS III.I] Parameter Title: Qww,m,y
Volume of the wastewater treated during the months m, during year y for the months with ambient average temperature above 15°C (in the baseline scenario).</td>
<td>1,2,6</td>
<td>See B.6.2.2.1.
<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Title in line with methodology?</td><td></td></tr>
<tr><td>Data unit correctly expressed?</td><td></td></tr>
<tr><td>Appropriate description of parameter?</td><td></td></tr>
<tr><td>Source clearly referenced?</td><td></td></tr>
<tr><td>Correct value provided?</td><td></td></tr>
<tr><td>Has this value been verified?</td><td></td></tr>
<tr><td>Choice of data correctly justified?</td><td></td></tr>
<tr><td>Measurement method correctly described?</td><td></td></tr>
</table></td>
<td>See CAR</td>
<td>þ</td>
</tr>
<tr>
<td>B.6.2.2.40. [AMS III.I] Parameter Title: CODremoved,i,m,y
Chemical oxygen demand removed by the anaerobic wastewater treatment system I in the baseline situation in the year y for the months m with ambient average tempera-</td>
<td>1,2,6</td>
<td>See B.6.2.2.2.
<table>
<tr><th>Data Checklist</th><th>Yes / No / NA</th></tr>
<tr><td>Title in line with methodology?</td><td></td></tr>
<tr><td>Data unit correctly expressed?</td><td></td></tr>
<tr><td>Appropriate description of parameter?</td><td></td></tr>
<tr><td>Source clearly referenced?</td><td></td></tr>
</table></td>
<td>See CAR</td>
<td>þ</td>
</tr>
</table>

ture above 15°C (tonnes/m3).		Correct value provided? | Has this value been verified? | Choice of data correctly justified? | Measurement method correctly described? |		
B.6.2.2.41. [**AMS III.I**] Parameter Title: MCFanaerobic,i Methane correction factor for the anaerobic baseline wastewater treatment system i replaced by the project activity, value as per table III.I.1	1,2,6	**Corrective Action Request No.30.** It should be clearly indicated which MCFanaerobic,i value is finally applied. Data Checklist | Yes / No / NA Title in line with methodology? | Yes Data unit correctly expressed? | NA Appropriate description of parameter? | Yes Source clearly referenced? | Yes Correct value provided? | No Has this value been verified? | Yes Choice of data correctly justified? | Yes Measurement method correctly described? | N/A	**CAR**	**þ**
B.6.2.2.42. [**AMS III.I**] Parameter Title: MCFaerobic,k Methane correction factor for the aerobic wastewater treatment system k (MCF vale for well managed aerobic biological systems, or for poorly managed or overloaded systems as per table III.I.1 shall be taken.	1,2,6	See B.6.2.1. Data Checklist | Yes / No / NA Title in line with methodology? | No Data unit correctly expressed? | No Appropriate description of parameter? | No Source clearly referenced? | No Correct value provided? | No Has this value been verified? | No Choice of data correctly justified? | No	**See CAR**	**þ**

		Measurement method correctly described? | No		
B.6.2.2.43. [**AMS III.I**] Parameter Title: MCFs Methane correction factor of the landfill that receives the final sludge, estimated as described in AMS-III.G	1,2,6	Not applicable Data Checklist | Yes / No / NA Title in line with methodology? | NA Data unit correctly expressed? | NA Appropriate description of parameter? | NA Source clearly referenced? | NA Correct value provided? | NA Has this value been verified? | NA Choice of data correctly justified? | NA Measurement method correctly described? | NA	**þ**	**þ**
B.6.3. *Ex-ante calculation of emission reductions*				
B.6.3.1. Is the projection based on the same procedures as used for future monitoring?	1,2	According to AMS III.H, version 11, §30, ex-post emission reductions shall be based on the lowest value of (i) The amount of biogas recovered and fuelled or flared (MDy), during the crediting period, that is monitored ex post (ii) Ex post calculated baseline, project and leakage emissions based on actual monitored data for the project activity According to AMS III.I, version 07, §20, emission reductions achieved by the project activity will be calculated as the difference between the baseline emission and the sum of the project emission and leakage, i.e. the projection is based on the same procedures as used for future monitoring. According to AMS I.D, version 13, §13, emission reductions from electricity generation are monitored by metering the electricity generated by the renewable technology and are multiplied with	**CAR**	**þ**

		the baseline emissions factor. The projection is based on the same procedures. **Corrective Action Request No.31.** 1. Please make clear in the PDD that regarding AMS III.H. ex-post emission reductions are based on the lower value of (i) The amount of biogas recovered and fuelled or flared (MDy), during the crediting period, that is monitored ex post (ii) Ex post calculated baseline, project and leakage emissions based on actual monitored data for the project activity. 2. Please mention in the PDD that emission reductions from electricity generation are based on the electricity generated multiplied with the grid emissions factor and that project emissions from electricity consumption for project equipment are considered respectively.		
B.6.3.2. Are the GHG calculations documented in a complete and transparent manner?	1,2, 36	**Corrective Action Request No.32.** The GHG calculations tool (excel file) should be submitted in English language in a complete and transparent manner to the validation team.	**CAR**	**þ**
B.6.3.3. If there is more than one component of the project activity, then are emission reduction calculations provided separately for each component?	1,2, 36	Yes. Emission reduction calculations are separately provided both for the applied methodologies AMS III.H, AMS III.I and AMS I.D and the 2 stages (stage 1 and stage 2).	**þ**	**þ**
B.6.3.4. Is the data provided in this section consistent with data as presented in other chapters of the PDD?	1,2	Yes, however the values have to be revised due to different CARs.	**See CARs**	**þ**
B.6.4. *Summary of the ex-ante estimation of emission reductions*				
B.6.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	1,2	Yes.	**þ**	**þ**
B.6.4.2. Is the form/table required for the indication of projected emission reductions cor-	1,2	Yes. However, see B.6.4.3.	**þ**	**þ**

rectly applied?				
B.6.4.3. If the project activity involves more than one component, is separate table included for each of the component.	1,2	No. **Corrective Action Request No.33.** A separate table for each of the components (AMS III.H, AMS III.I and AMS I.D) should be provided in B.6.4.	**CAR**	þ
B.6.4.4. Do these values comply with small-scale criteria for every year?	1,2	Yes. Total emission reductions are for each year less than 60,000 tCO2.	þ	þ
B.6.4.5. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	1,2	See A.4.2.11.	**See CAR**	þ
B.6.4.6. Is the data provided in this section in consistency with data as presented in other chapters of the PDD?	1,2	Yes, however the values have to be revised due to different CARs.	**See CARs**	þ
B.7. Application of the monitoring methodology and description of the monitoring plan				
B.7.1. *Data and parameters monitored*				
B.7.1.1. Is the list of parameters presented in chapter B.7.1 considered to be complete with regard to the requirements of the applied methodology?	1,2,4,5,6	**Corrective Action Request No.34.** The following parameters including its specifications should be included into B.7.1. of the PDD: 1. $COD_{ww, removed, PJ, k, y}$ COD removed by project treatment system k in year y (tonne/m^3) 2. End use of final sludge generated (§39 AMS III.H.and §23 AMS III.I). 3. EF(CM) Emissions factor (combined margin) 4. MD_y Methane captured and destroyed/ gainfully used by the project activity in year y (tCO2e) including the indication of the formula how MDy is calculated. 5. D_{CH4} Density of methane at the temperature and pressure of	**CAR**	þ

		the biogas in year y (tonnes/m^3) 6. Other flare operation parameters (in the case a default value for the flare efficiency is used) 7. ECy,grid Net electricity supplied to the grid		
B.7.1.2. Comment on any line answered with "No"				
B.7.1.2.1. Parameter Title: Volume of wastewater treated in project situation (m^3)	1,2,5	As it was informed during the on-site visit, Parshall flume flow meter will be used. **Corrective Action Request No.35.** Regarding the parameter "Volume of wastewater treated in project situation": Please indicate that the wastewater outflow will be the same as inflow. Title, data unit, description, measurement method should be revised; a reference to standards and accuracy should be indicated. QA/QC procedures should be revised (will there be any calibration for the Parshall flume flow meter?). The parameter should be specified for both systems (anaerobic digester system and aerobic physical-chemical system).	**CAR**	**þ**

Monitoring Checklist	Yes / No
Title in line with methodology?	No
Data unit correctly expressed?	No
Appropriate description of parameter?	No
Source clearly referenced?	Yes
Correct value provided for estimation?	Yes
Has this value been verified?	Yes
Measurement method correctly described?	No
Correct reference to standards?	No
Indication of accuracy provided?	No
QA/QC procedures described?	Yes
QA/QC procedures appropriate?	No

<table>
<tr>
<td>B.7.1.2.2. Parameter Title:
Volume of wastewater discharged in project situation (m^3)</td>
<td>1,2,5</td>
<td>See B.7.1.2.1.
<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td>See B.7.1.2.1</td></tr>
<tr><td>Data unit correctly expressed?</td><td>See B.7.1.2.1</td></tr>
<tr><td>Appropriate description of parameter?</td><td>See B.7.1.2.1</td></tr>
<tr><td>Source clearly referenced?</td><td>See B.7.1.2.1</td></tr>
<tr><td>Correct value provided for estimation?</td><td>See B.7.1.2.1</td></tr>
<tr><td>Has this value been verified?</td><td>See B.7.1.2.1</td></tr>
<tr><td>Measurement method correctly described?</td><td>See B.7.1.2.1</td></tr>
<tr><td>Correct reference to standards?</td><td>See B.7.1.2.1</td></tr>
<tr><td>Indication of accuracy provided?</td><td>See B.7.1.2.1</td></tr>
<tr><td>QA/QC procedures described?</td><td>See B.7.1.2.1</td></tr>
<tr><td>QA/QC procedures appropriate?</td><td>See B.7.1.2.1</td></tr>
</table></td>
<td>See CAR</td>
<td>þ</td>
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<tr>
<td>B.7.1.2.3. Parameter Title:
$S_{l, PJ, y}$ Amount of dry matter in the sludge treated by the sludge treatment system l in year y in the project scenario (tonne) (AMS III.H and AMS III.I)</td>
<td>1,2,5,6</td>
<td>Not applicable, as neither baseline nor project emissions from sludge treatment are considered for the proposed project activity.
<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td>NA</td></tr>
<tr><td>Data unit correctly expressed?</td><td>NA</td></tr>
</table></td>
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</table>

		Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided for estimation? NA Has this value been verified? NA Measurement method correctly described? NA Correct reference to standards? NA Indication of accuracy provided? NA QA/QC procedures described? NA QA/QC procedures appropriate? NA		
B.7.1.2.4. Parameter Title: $S_{final, PJ, y}$ Amount of dry matter in final sludge generated by the project wastewater treatment systems in the year y (tonne) **(AMS III.H and AMS III.I)**	1,2,5,6	Not applicable Monitoring Checklist / Yes / No Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided for estimation? NA Has this value been verified? NA Measurement method correctly described? NA Correct reference to standards? NA Indication of accuracy provided? NA QA/QC procedures described? NA QA/QC procedures appropriate? NA	**þ**	**þ**
B.7.1.2.5. Parameter Title: SGR_{PJ} Sludge generation ratio of the wastewater treatment plant in the project scenario **(AMS III.H and AMS III.I)**	1,2,5,6	Not applicable Monitoring Checklist / Yes / No	**þ**	**þ**

		<table><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided for estimation?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr><tr><td>Correct reference to standards?</td><td>NA</td></tr><tr><td>Indication of accuracy provided?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table>		
B.7.1.2.6. Parameter Title: $COD_{ww,\ untreated,\ y}$ COD of the wastewater before the anaerobic treatment system k affected by the project activity (tonne/m^3) **(AMS III.H and AMS III.I)**	1,2,5,6	COD will be measured once per month by LAR according to the information provided during the on-site visit. Third party checks will be performed once a month. **Corrective Action Request No.36.** Regarding the parameter $COD_{ww,untreated,y:}$ Measurement method and QA/QC procedures should be revised. <table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided for estimation?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr><tr><td>Correct reference to standards?</td><td>Yes</td></tr><tr><td>Indication of accuracy provided?</td><td>Yes</td></tr><tr><td>QA/QC procedures described?</td><td>Yes</td></tr><tr><td>QA/QC procedures appropriate?</td><td>No</td></tr></table>	**CAR**	**þ**

B.7.1.2.7. Parameter Title: $COD_{ww, treated, y}$ COD of the wastewater after the anaerobic treatment system k affected by the project activity (tonne/m^3) **(AMS III.H and AMS III.I)**	1,2,5,6	**Corrective Action Request No.37.** Regarding parameter $COD_{ww, treated, y}$: Please specify each of the systems. Title, data unit and description should be revised as well as measurement method and frequency of monitoring. Monitoring Checklist / Yes / No Title in line with methodology? / No Data unit correctly expressed? / No Appropriate description of parameter? / No Source clearly referenced? / Yes Correct value provided for estimation? / Not applicable Has this value been verified? / Not applicable Measurement method correctly described? / No Correct reference to standards? / Yes Indication of accuracy provided? / Yes QA/QC procedures described? / Yes QA/QC procedures appropriate? / Yes	**CAR**	**þ**
B.7.1.2.8. Parameter Title: $COD_{ww, removed, PJ, k, y}$ COD removed by project treatment system k in year y (tonne/m^3) **(AMS III.H and AMS III.I)** Note: $COD_{ww, removed, PJ,,k, y} = COD_{ww, untreated, PJ, k} – COD_{ww, treated, PJ, k}$	1,2,5,6	See B.7.1.1. Monitoring Checklist / Yes / No Title in line with methodology? / No Data unit correctly expressed? / No Appropriate description of parameter? / No Source clearly referenced? / No Correct value provided for estimation? / No Has this value been verified? / No	**See CAR**	**þ**

		Measurement method correctly described? — No Correct reference to standards? — No Indication of accuracy provided? — No QA/QC procedures described? — No QA/QC procedures appropriate? — No		
B.7.1.2.9. Parameter Title: $COD_{ww, discharge, PJ, k, y}$ COD of the treated wastewater discharged into sea, river or lake in the project situation in the year y (tonne/m^3) **(AMS III.H and AMS III.I)**	1,2,5,6	See B.7.1.2.7. **Corrective Action Request No.38.** Please make clear in the B.7.1. of the PDD why $COD_{ww, discharge, PJ, k, y}$ is equivalent to COD (treated) as it was communicated during the on-site visit. Monitoring Checklist — Yes / No Title in line with methodology? Data unit correctly expressed? Appropriate description of parameter? Source clearly referenced? Correct value provided for estimation? Has this value been verified? Measurement method correctly described? Correct reference to standards? Indication of accuracy provided? QA/QC procedures described? QA/QC procedures appropriate?	**CAR**	**þ**
B.7.1.2.10. Parameter Title: Annual fossil fuel and/or electricity used to operate the facilities or power auxiliary equipment **(AMS III.H and AMS III.I)**	1,2,5,6	**Corrective Action Request No.39.** As no proper electricity meter for the electricity consumption is available, PPs decided to conservatively determine the electricity consumption of the project equipment by means of the total in-	**CAR**	**þ**

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<td>stalled capacity of the equipment, i.e. assuming that all relevant electrical equipment operates at full rated capacity. 10% to account for distribution losses for 8760 hours per annum (according to §35 of AMS III.H) should be considered.
Please revise the specifications of the parameter “Annual fossil fuel and/or electricity used to operate the facilities or power auxiliary equipment” respectively.

<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td>Yes</td></tr>
<tr><td>Data unit correctly expressed?</td><td>Yes</td></tr>
<tr><td>Appropriate description of parameter?</td><td>Yes</td></tr>
<tr><td>Source clearly referenced?</td><td>Yes</td></tr>
<tr><td>Correct value provided for estimation?</td><td>No</td></tr>
<tr><td>Has this value been verified?</td><td>Yes</td></tr>
<tr><td>Measurement method correctly described?</td><td>No</td></tr>
<tr><td>Correct reference to standards?</td><td>No</td></tr>
<tr><td>Indication of accuracy provided?</td><td>No</td></tr>
<tr><td>QA/QC procedures described?</td><td>No</td></tr>
<tr><td>QA/QC procedures appropriate?</td><td>No</td></tr>
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<tr>
<td>B.7.1.2.11. Parameter Title:
Quantity of biogas recovered, or bottled, injected into the natural gas grid or distributed via the dedicated piped network (m^3)</td>
<td>1,2,5</td>
<td>Not applicable
<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td>NA</td></tr>
<tr><td>Data unit correctly expressed?</td><td>NA</td></tr>
<tr><td>Appropriate description of parameter?</td><td>NA</td></tr>
<tr><td>Source clearly referenced?</td><td>NA</td></tr>
<tr><td>Correct value provided for estimation?</td><td>NA</td></tr>
<tr><td>Has this value been verified?</td><td>NA</td></tr>
<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
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</table>

		Correct reference to standards? NA Indication of accuracy provided? NA QA/QC procedures described? NA QA/QC procedures appropriate? NA		
B.7.1.2.12. Parameter Title: MD_y Methane captured and destroyed/ gainfully used by the project activity in year y (tCO2e)	1,2,5	See B.7.1.1. Monitoring Checklist / Yes / No: Title in line with methodology? No Data unit correctly expressed? No Appropriate description of parameter? No Source clearly referenced? No Correct value provided for estimation? No Has this value been verified? No Measurement method correctly described? No Correct reference to standards? No Indication of accuracy provided? No QA/QC procedures described? No QA/QC procedures appropriate? No	**See CAR**	**þ**
B.7.1.2.13. Parameter Title: $BG_{burnt, y}$ Biogas flared/combusted in year y (m^3)	1,2,5	**Corrective Action Request No.40.** Regarding the parameter "$BG_{burnt, y}$ Biogas flared/combusted in year (m3)": The title and description should be revised. Monitoring Checklist / Yes / No: Title in line with methodology? No Data unit correctly expressed? Yes Appropriate description of parameter? No Source clearly referenced? Yes	**CAR**	**þ**

		Correct value provided for estimation? — Not applicable Has this value been verified? — Not applicable Measurement method correctly described? — Yes Correct reference to standards? — N/A Indication of accuracy provided? — N/A (flow meter has not been chosen yet) QA/QC procedures described? — Yes QA/QC procedures appropriate? — Yes		
B.7.1.2.14. Parameter Title: $w_{CH4, y}$ Methane content in the biogas injected into the natural gas grid/distributed via the dedicated piped network, or flared/combusted, in year y (mass fraction)	1,2,5	Not applicable Monitoring Checklist — Yes / No Title in line with methodology? — NA Data unit correctly expressed? — NA Appropriate description of parameter? — NA Source clearly referenced? — NA Correct value provided for estimation? — NA Has this value been verified? — NA Measurement method correctly described? — NA Correct reference to standards? — NA Indication of accuracy provided? — NA QA/QC procedures described? — NA QA/QC procedures appropriate? — NA	**þ**	**þ**

<table>
<tr>
<td>B.7.1.2.15. Parameter Title:
D_{CH4} Density of methane at the temperature and pressure of the biogas in year y (tonnes/m^3)</td>
<td>1,2,5</td>
<td>See B.7.1.1.
<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td>No</td></tr>
<tr><td>Data unit correctly expressed?</td><td>No</td></tr>
<tr><td>Appropriate description of parameter?</td><td>No</td></tr>
<tr><td>Source clearly referenced?</td><td>No</td></tr>
<tr><td>Correct value provided for estimation?</td><td>No</td></tr>
<tr><td>Has this value been verified?</td><td>No</td></tr>
<tr><td>Measurement method correctly described?</td><td>No</td></tr>
<tr><td>Correct reference to standards?</td><td>No</td></tr>
<tr><td>Indication of accuracy provided?</td><td>No</td></tr>
<tr><td>QA/QC procedures described?</td><td>No</td></tr>
<tr><td>QA/QC procedures appropriate?</td><td>No</td></tr>
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</td>
<td>See CAR</td>
<td>þ</td>
</tr>
<tr>
<td>B.7.1.2.16. Parameter Title:
FE Flare efficiency in year y (fraction)</td>
<td>1,2,5</td>
<td>Not applicable
<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td></td></tr>
<tr><td>Data unit correctly expressed?</td><td></td></tr>
<tr><td>Appropriate description of parameter?</td><td></td></tr>
<tr><td>Source clearly referenced?</td><td></td></tr>
<tr><td>Correct value provided for estimation?</td><td></td></tr>
<tr><td>Has this value been verified?</td><td></td></tr>
<tr><td>Measurement method correctly described?</td><td></td></tr>
<tr><td>Correct reference to standards?</td><td></td></tr>
<tr><td>Indication of accuracy provided?</td><td></td></tr>
<tr><td>QA/QC procedures described?</td><td></td></tr>
<tr><td>QA/QC procedures appropriate?</td><td></td></tr>
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<tr>
<td>B.7.1.2.17. Parameter Title:
Temperature of biogas</td>
<td>1,2,5</td>
<td><u>Clarification Request No. 7.</u>
The PPs should clarify what type of gas flow meter (measuring just gas flow or besides gas flow as well temperature and pressure) will be used in the proposed project activity. Depending on that, temperature and pressure of biogas have to be monitored or do not need to be monitored (refer to §36 AMS III.H).
<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td>CR</td></tr>
<tr><td>Data unit correctly expressed?</td><td>CR</td></tr>
<tr><td>Appropriate description of parameter?</td><td>CR</td></tr>
<tr><td>Source clearly referenced?</td><td>CR</td></tr>
<tr><td>Correct value provided for estimation?</td><td>CR</td></tr>
<tr><td>Has this value been verified?</td><td>CR</td></tr>
<tr><td>Measurement method correctly described?</td><td>CR</td></tr>
<tr><td>Correct reference to standards?</td><td>CR</td></tr>
<tr><td>Indication of accuracy provided?</td><td>CR</td></tr>
<tr><td>QA/QC procedures described?</td><td>CR</td></tr>
<tr><td>QA/QC procedures appropriate?</td><td>CR</td></tr>
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<td>CR</td>
<td>þ</td>
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<tr>
<td>B.7.1.2.18. Parameter Title:
Pressure of biogas</td>
<td>1,2,5</td>
<td>See B.7.1.2.17.
<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td>CR</td></tr>
<tr><td>Data unit correctly expressed?</td><td>CR</td></tr>
<tr><td>Appropriate description of parameter?</td><td>CR</td></tr>
<tr><td>Source clearly referenced?</td><td>CR</td></tr>
<tr><td>Correct value provided for estimation?</td><td>CR</td></tr>
<tr><td>Has this value been verified?</td><td>CR</td></tr>
<tr><td>Measurement method correctly described?</td><td>CR</td></tr>
<tr><td>Correct reference to standards?</td><td>CR</td></tr>
<tr><td>Indication of accuracy provided?</td><td>CR</td></tr>
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<td>See CR</td>
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</table>

		QA/QC procedures described? CR QA/QC procedures appropriate? CR		
B.7.1.2.19. Parameter Title: $E_{ug, y}$ Energy delivered from the upgraded biogas in the project activity to the natural gas distribution grid in year y (TJ)	1,2,5	Not applicable Monitoring Checklist / Yes / No Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided for estimation? NA Has this value been verified? NA Measurement method correctly described? NA Correct reference to standards? NA Indication of accuracy provided? NA QA/QC procedures described? NA QA/QC procedures appropriate? NA	þ	þ
B.7.1.2.20. Parameter Title: $Q_{ug, y}$ Quantity of upgraded biogas displacing the use of natural gas in the natural gas distribution grid in year y (kg or m^3)	1,2,5	Not applicable Monitoring Checklist / Yes / No Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided for estimation? NA Has this value been verified? NA Measurement method correctly described? NA Correct reference to standards? NA Indication of accuracy provided? NA	þ	þ

		QA/QC procedures described? NA QA/QC procedures appropriate? NA		
B.7.1.2.21. Parameter Title: $Q_{ug, in, y}$ Quantity of upgraded biogas injected into the natural gas distribution grid in year y (kg or m^3)	1,2,5	Not applicable Monitoring Checklist / Yes / No Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided for estimation? NA Has this value been verified? NA Measurement method correctly described? NA Correct reference to standards? NA Indication of accuracy provided? NA QA/QC procedures described? NA QA/QC procedures appropriate? NA	þ	þ
B.7.1.2.22. Parameter Title: $Q_{cap, CH4, y}$ Quantity of methane captured at the wastewater treatment source facility(ies) in year y (kg or m^3)	1,2,5	Not applicable Monitoring Checklist / Yes / No Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided for estimation? NA Has this value been verified? NA Measurement method correctly described? NA Correct reference to standards? NA Indication of accuracy provided? NA	þ	þ

		QA/QC procedures described? — NA QA/QC procedures appropriate? — NA		
B.7.1.2.23. Parameter Title: $w_{CH4, ww}$ Methane fraction of biogas as monitored at the outlet of the wastewater treatment source facility(ies) (kg or m^3 CH_4/kg or m^3 of biogas)	1,2,5	**Corrective Action Request No.41.** Regarding the parameter $w_{CH4, ww}$ Methane fraction of biogas as monitored at the outlet of the wastewater treatment source facility(ies) (kg or m^3 CH_4/kg or m^3 of biogas): It should be made clear that $w_{CH4, ww}$ is equivalent to $fv_{CH4,h}$, the measurement method (dry or wet as basis? Continuous measurement or measurements with a 95% confidence interval?) should be revised, reference to standards, accuracy should be indicated. A comment should be included that the simplified approach is chosen, namely only methane content is monitored and the difference is considered to be nitrogen. Monitoring Checklist — Yes / No Title in line with methodology? — No Data unit correctly expressed? — Yes Appropriate description of parameter? — Yes Source clearly referenced? — Yes Correct value provided for estimation? — NA Has this value been verified? — NA Measurement method correctly described? — No Correct reference to standards? — No Indication of accuracy provided? — No QA/QC procedures described? — Yes QA/QC procedures appropriate? — Yes	**CAR**	**þ**
B.7.1.2.24. Parameter Title: $Q_{cap, biogas, y}$ Monitored amount of biogas	1,2,5	Not applicable	**þ**	**þ**

captured at the source facility(ies) (kg or m^3)		Monitoring Checklist / Yes / No: Title in line with methodology?; Data unit correctly expressed?; Appropriate description of parameter?; Source clearly referenced?; Correct value provided for estimation?; Has this value been verified?; Measurement method correctly described?; Correct reference to standards?; Indication of accuracy provided?; QA/QC procedures described?; QA/QC procedures appropriate?		
B.7.1.2.25. Parameter Title: In case of project activities covered under paragraph 2 (b) and 2 (c) $Q_{ww, upgrade, y}$ Volume of wastewater discharge from water wash upgrading installation in year y	1,2,5	Not applicable Monitoring Checklist / Yes / No: Title in line with methodology? NA; Data unit correctly expressed? NA; Appropriate description of parameter? NA; Source clearly referenced? NA; Correct value provided for estimation? NA; Has this value been verified? NA; Measurement method correctly described? NA; Correct reference to standards? NA; Indication of accuracy provided? NA; QA/QC procedures described? NA; QA/QC procedures appropriate? NA	**þ**	**þ**
B.7.1.2.26. Parameter TitleIn case of pro-	1,2,5	Not applicable	**þ**	**þ**

ject activities covered under paragraph 2 (b) and 2 (c) $[CH_4]_{ww,\ upgrade,\ y}$ Dissolved methane contained in the wastewater discharge in year y		<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided for estimation?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr><tr><td>Correct reference to standards?</td><td>NA</td></tr><tr><td>Indication of accuracy provided?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table>		
B.7.1.2.27. Parameter Title: $w_{CH4,\ stream,\ y}$ Average methane weight fraction of the gas (kg CH_4/kg) in year y	1,2,5	Not applicable <table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided for estimation?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr><tr><td>Correct reference to standards?</td><td>NA</td></tr><tr><td>Indication of accuracy provided?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table>	**þ**	**þ**
B.7.1.2.28. Parameter Title:	1,2,5	Not applicable	**þ**	**þ**

<table>
<tr>
<td>In case of project activities covered under paragraph 2 (b) and 2 (c)
$T_{equipment, y}$ Operation time of the equipment in hours in year y</td>
<td></td>
<td>
<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td>NA</td></tr>
<tr><td>Data unit correctly expressed?</td><td>NA</td></tr>
<tr><td>Appropriate description of parameter?</td><td>NA</td></tr>
<tr><td>Source clearly referenced?</td><td>NA</td></tr>
<tr><td>Correct value provided for estimation?</td><td>NA</td></tr>
<tr><td>Has this value been verified?</td><td>NA</td></tr>
<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
<tr><td>Correct reference to standards?</td><td>NA</td></tr>
<tr><td>Indication of accuracy provided?</td><td>NA</td></tr>
<tr><td>QA/QC procedures described?</td><td>NA</td></tr>
<tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr>
</table>
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<td></td>
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</tr>
<tr>
<td>B.7.1.2.29. Parameter Title:
$TM_{RG, h}$ Mass flow rate of methane in the residual gas in hour h (kg/h)</td>
<td>1,2,5</td>
<td>This parameter would be only applicable if the flare efficiency is continuously monitored. See 6.2.2.32
<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td></td></tr>
<tr><td>Data unit correctly expressed?</td><td></td></tr>
<tr><td>Appropriate description of parameter?</td><td></td></tr>
<tr><td>Source clearly referenced?</td><td></td></tr>
<tr><td>Correct value provided for estimation?</td><td></td></tr>
<tr><td>Has this value been verified?</td><td></td></tr>
<tr><td>Measurement method correctly described?</td><td></td></tr>
<tr><td>Correct reference to standards?</td><td></td></tr>
<tr><td>Indication of accuracy provided?</td><td></td></tr>
<tr><td>QA/QC procedures described?</td><td></td></tr>
<tr><td>QA/QC procedures appropriate?</td><td></td></tr>
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</td>
<td>See CAR</td>
<td>þ</td>
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</table>

<table>
<tr>
<td>B.7.1.2.30. Parameter Title:
$\eta_{flare, h}$ Flare efficiency in hour</td>
<td>1,2,5</td>
<td>Not applicable if the default value will be applied, otherwise yes.
Please see 6.2.2.32

<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td></td></tr>
<tr><td>Data unit correctly expressed?</td><td></td></tr>
<tr><td>Appropriate description of parameter?</td><td></td></tr>
<tr><td>Source clearly referenced?</td><td></td></tr>
<tr><td>Correct value provided for estimation?</td><td></td></tr>
<tr><td>Has this value been verified?</td><td></td></tr>
<tr><td>Measurement method correctly described?</td><td></td></tr>
<tr><td>Correct reference to standards?</td><td></td></tr>
<tr><td>Indication of accuracy provided?</td><td></td></tr>
<tr><td>QA/QC procedures described?</td><td></td></tr>
<tr><td>QA/QC procedures appropriate?</td><td></td></tr>
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</td>
<td>See CAR</td>
<td>þ</td>
</tr>
<tr>
<td>B.7.1.2.31. Parameter Title:
$Q_{methane, pipeline, y}$ Total quantity of methane transported in the dedicated piped network in year y (m^3)</td>
<td>1,2,5</td>
<td>Not applicable
<table>
<tr><th>Monitoring Checklist</th><th>Yes / No</th></tr>
<tr><td>Title in line with methodology?</td><td>NA</td></tr>
<tr><td>Data unit correctly expressed?</td><td>NA</td></tr>
<tr><td>Appropriate description of parameter?</td><td>NA</td></tr>
<tr><td>Source clearly referenced?</td><td>NA</td></tr>
<tr><td>Correct value provided for estimation?</td><td>NA</td></tr>
<tr><td>Has this value been verified?</td><td>NA</td></tr>
<tr><td>Measurement method correctly described?</td><td>NA</td></tr>
<tr><td>Correct reference to standards?</td><td>NA</td></tr>
<tr><td>Indication of accuracy provided?</td><td>NA</td></tr>
<tr><td>QA/QC procedures described?</td><td>NA</td></tr>
<tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr>
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<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>B.7.1.2.32. Parameter Title:
$Q_{methane, bb, y}$ Total quantity of methane bottled in year y(m^3)</td><td>1,2,5</td><td>Not applicable
<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided for estimation?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr><tr><td>Correct reference to standards?</td><td>NA</td></tr><tr><td>Indication of accuracy provided?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table></td><td>þ</td><td>þ</td></tr>
<tr><td>B.7.1.2.33. Parameter Title:
$Q_{bb, y}$ Total freight volume of upgraded biogas in bottles transported in year y (m^3)</td><td>1,2,5</td><td>Not applicable
<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided for estimation?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr><tr><td>Correct reference to standards?</td><td>NA</td></tr><tr><td>Indication of accuracy provided?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table></td><td>þ</td><td>þ</td></tr>
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<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>B.7.1.2.34. Parameter Title:
In case of project activities covered under paragraph 2 (b) and 2 (c)
$CT_{bb, y}$ Average truck freight volume capacity for the transportation of bottles with upgraded biogas (m^3/truck)</td><td>1,2,5</td><td>Not applicable
<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided for estimation?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr><tr><td>Correct reference to standards?</td><td>NA</td></tr><tr><td>Indication of accuracy provided?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table></td><td>þ</td><td>þ</td></tr>
<tr><td>B.7.1.2.35. Parameter Title:
In case of project activities covered under paragraph 2 (b) and 2 (c)
DAF_{bb} Aggregated average distance for bottle transportation, biogas filled bottles to the end users and the return of empty bottles to the filling site (km/truck)</td><td>1,2,5</td><td>Not applicable
<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided for estimation?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr><tr><td>Correct reference to standards?</td><td>NA</td></tr><tr><td>Indication of accuracy provided?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table></td><td>þ</td><td>þ</td></tr>
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<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>B.7.1.2.36. Parameter Title:
Composition of the biogas bottled.</td><td>1,2,5</td><td>Not applicable
<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided for estimation?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr><tr><td>Correct reference to standards?</td><td>NA</td></tr><tr><td>Indication of accuracy provided?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table></td><td>þ</td><td>þ</td></tr>
<tr><td>B.7.1.2.37. Parameter Title:
End use of final sludge generated (AMS III.H and AMS III.I).</td><td>1,2,5
,6</td><td>B.7.1.1.
<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>No</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided for estimation?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr><tr><td>Correct reference to standards?</td><td>No</td></tr><tr><td>Indication of accuracy provided?</td><td>No</td></tr><tr><td>QA/QC procedures described?</td><td>No</td></tr><tr><td>QA/QC procedures appropriate?</td><td>No</td></tr></table></td><td>See CAR</td><td>þ</td></tr>
</table>

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<tr><td>B.7.1.2.38. Parameter Title:
Volumetric fraction of oxygen in the exhaust gas of the flare (only applicable if default value for flare is not used)</td><td>1,2,5</td><td>Not applicable if the default value will be applied, otherwise yes.
Please see 6.2.2.32

<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided for estimation?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr><tr><td>Correct reference to standards?</td><td>NA</td></tr><tr><td>Indication of accuracy provided?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table></td><td>See CAR</td><td>þ</td></tr>
<tr><td>B.7.1.2.39. Parameter Title:
Concentration of methane in the exhaust gas of flare on dry basis and at Normal Temperature and Pressure (NTP) (only applicable if default value for flare is not used)</td><td>1,2,5</td><td>Not applicable if the default value will be applied, otherwise yes.
Please see 6.2.2.32

<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided for estimation?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr></table></td><td>See CAR</td><td>þ</td></tr>
</table>

		Measurement method correctly described? NA Correct reference to standards? NA Indication of accuracy provided? NA QA/QC procedures described? NA QA/QC procedures appropriate? NA		
B.7.1.2.40. Parameter Title: T_{flare} Temperature in the exhaust gas of the flare		**Corrective Action Request No.42.** Regarding the parameter "T_{flare} Temperature in the exhaust gas of the flare": The QA/QC procedures should be revised (annual calibration is necessary according to the Tool to determine project emissions from flaring); in measurement methods it should be added that "a temperature above 500°C indicates that a significant amount of gases are still being burnt and that the flare is operating". Monitoring Checklist: Yes / No Title in line with methodology? Yes Data unit correctly expressed? Yes Appropriate description of parameter? Yes Source clearly referenced? Yes Correct value provided for estimation? NA Has this value been verified? NA Measurement method correctly described? No Correct reference to standards? Yes Indication of accuracy provided? NA QA/QC procedures described? Yes QA/QC procedures appropriate? No	**CAR**	**þ**
B.7.1.2.41. Parameter Title:		See B.7.1.1.	**See**	**þ**

Other flare operation parameters		Monitoring Checklist / Yes / No Title in line with methodology? No Data unit correctly expressed? No Appropriate description of parameter? No Source clearly referenced? No Correct value provided for estimation? No Has this value been verified? No Measurement method correctly described? No Correct reference to standards? No Indication of accuracy provided? No QA/QC procedures described? No QA/QC procedures appropriate? No	**CAR**	
B.7.1.2.42. Parameter Title Fraction of methane captured at the SWDS and flared, combusted or used in another manner(f) *(In case of storage of biomass under an-aerobic conditions is not taken place in the baseline situation)*	1,2,5	Monitoring Checklist / Yes / No Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided for estimation? NA Has this value been verified? NA Measurement method correctly described? NA Correct reference to standards? NA Indication of accuracy provided? NA QA/QC procedures described? NA QA/QC procedures appropriate? NA	**þ**	**þ**
B.7.1.2.43. Total amount of organic waste prevented from disposal in year x (tons) (Wx) *(In case of storage of biomass under an-aerobic conditions is not taken place in the*		Monitoring Checklist / Yes / No Title in line with methodology? NA Data unit correctly expressed? NA Appropriate description of parameter? NA Source clearly referenced? NA Correct value provided for estimation? NA	**þ**	**þ**

baseline situation)		Has this value been verified?	NA			
		Measurement method correctly described?	NA			
		Correct reference to standards?	NA			
		Indication of accuracy provided?	NA			
		QA/QC procedures described?	NA			
		QA/QC procedures appropriate?	NA			
B.7.1.2.44. Parameter Title Weight fraction of the waste type j in the sample n collected during the year x ($p_{n,j,x}$) *(In case of storage of biomass under an-aerobic conditions is not taken place in the baseline situation)*	1,2,5	Monitoring Checklist	Yes / No		þ	þ
		Title in line with methodology?	NA			
		Data unit correctly expressed?	NA			
		Appropriate description of parameter?	NA			
		Source clearly referenced?	NA			
		Correct value provided for estimation?	NA			
		Has this value been verified?	NA			
		Measurement method correctly described?	NA			
		Correct reference to standards?	NA			
		Indication of accuracy provided?	NA			
		QA/QC procedures described?	NA			
		QA/QC procedures appropriate?	NA			
B.7.1.2.45. Parameter Title Number of samples collected during the year x(z) *(In case of storage of biomass under an-aerobic conditions is not taken place in the baseline situation)*	1,2,5	Monitoring Checklist	Yes / No		þ	þ
		Title in line with methodology?	NA			
		Data unit correctly expressed?	NA			
		Appropriate description of parameter?	NA			
		Source clearly referenced?	NA			
		Correct value provided for estimation?	NA			
		Has this value been verified?	NA			
		Measurement method correctly described?	NA			
		Correct reference to standards?	NA			
		Indication of accuracy provided?	NA			
		QA/QC procedures described?	NA			
		QA/QC procedures appropriate?	NA			
B.7.1.2.46. In case the baseline emission included the anaerobic decay of final		Not applicable			þ	þ

<table>
<tr><td>sludge generated by the baseline treatment systems in a landfill without methane recovery, is the baseline disposal clearly defined in the PDD? Is the situation verified?</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B.7.1.2.47. [AMS III.I] Parameter title:
Volume of wastewater treated (Qww,y)</td><td>1,2,6</td><td>See B.7.1.2.1.
<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td></td></tr><tr><td>Data unit correctly expressed?</td><td></td></tr><tr><td>Appropriate description of parameter?</td><td></td></tr><tr><td>Source clearly referenced?</td><td></td></tr><tr><td>Correct value provided for estimation?</td><td></td></tr><tr><td>Has this value been verified?</td><td></td></tr><tr><td>Measurement method correctly described?</td><td></td></tr><tr><td>Correct reference to standards?</td><td></td></tr><tr><td>Indication of accuracy provided?</td><td></td></tr><tr><td>QA/QC procedures described?</td><td></td></tr><tr><td>QA/QC procedures appropriate?</td><td></td></tr></table></td><td>See CAR</td><td>þ</td></tr>
<tr><td>B.7.1.2.48. Parameter title:
ECy,grid Net electricity supplied to the grid</td><td></td><td>See B.7.1.1.
<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>No</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided for estimation?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr><tr><td>Correct reference to standards?</td><td>No</td></tr><tr><td>Indication of accuracy provided?</td><td>No</td></tr><tr><td>QA/QC procedures described?</td><td>No</td></tr></table></td><td>See CAR</td><td>þ</td></tr>
</table>

		QA/QC procedures appropriate? | No		
B.7.1.2.49. [AMS III.I] Parameter title: In case a MCF value of zero is adopted for the project wastewater treatment system assuming that it is a well managed aerobic system: Is its operation documented in a quality control program, and is one of the following 2 options used: 1) Are the conditions monitored to ensure the aerobic condition of the reactors and is the acceptable range of operational parameters (e.g. running time of aerators, flows, COD loads) defined for continuous aerobic operation of the treatment system and in accordance with the engineering design parameters of the wastewater treatment system and reported in the PDD? Will the operational parameters be continuously monitored to ensure that they are always kept in the design range of operating conditions? 2) Is dissolved oxygen (DO) continuously monitored or on a sample basis (use 90/10 precision for sampling) to demonstrate that there are no anaerobic pockets (DO level shall be 1 mg/L or above) in the reactor during operation? Note:	1,2,6	IRL 9 (Environmental Control Plan) documents a quality control program and mentions on page 21 engineering design parameter of the physical chemical wastewater treatment system, as minimum COD removal of 90%, minimum BOD removal of 90%, minimum removal of oils of 94% and minimum removal of suspended solids of 90%. **Corrective Action Request No.43.** The PDD should inform about the quality control program of the aerobic (physical chemical) treatment system, its monitoring and should explain some of the most important operational parameters (like minimum removal efficiency of COD, BOD, oils, suspended solids).	**CAR**	**þ**

- In case the operational parameters are not within these limits for a period of time, a MCF value of 0.3 shall be taken for that period. - In case existence of anaerobic pockets is indicated by a measurement of low DO value (less than 1 mg/L) then a MCF value of 0.3 shall be taken for the period of time between the previous measurement and this current measurement.				
B.7.1.2.50. [AMS I-D] Parameter title: EGy Electricity generated by the renewable electricity	1,2,4	**Corrective Action Request No.44.** Regarding the parameter "EG_{BLy} Electricity generated by the renewable electricity": Accuracy and reference to standard of the metering instrument should be indicated. It should be further indicated that electricity data are hourly measured and monthly recorded as per methodology AMS I.D, version 15. Monitoring Checklist: Yes / No Title in line with methodology? Yes Data unit correctly expressed? Yes Appropriate description of parameter? Yes Source clearly referenced? Yes Correct value provided for estimation? No Has this value been verified? Yes Measurement method correctly described? No Correct reference to standards? No Indication of accuracy provided? No QA/QC procedures described? Yes QA/QC procedures appropriate? Yes	**CAR**	**þ**
B.7.1.2.51. [AMS I-D] Parameter title:	1,2,4	See B.7.1.1.	**See**	**þ**

EF(CM) Emissions factor (combined margin)		<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>No</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided for estimation?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr><tr><td>Correct reference to standards?</td><td>No</td></tr><tr><td>Indication of accuracy provided?</td><td>No</td></tr><tr><td>QA/QC procedures described?</td><td>No</td></tr><tr><td>QA/QC procedures appropriate?</td><td>No</td></tr></table>	**CAR**	
B.7.2. *Description of the monitoring plan*				
B.7.2.1. Is the operational and management structure clearly described and in compliance with the envisioned situation?	1,2	Yes. A monitoring plan structure and the roles of the different members (project manager, project engineer, technicians) involved in the monitoring plan is indicated in B.7.2.	**þ**	**þ**
B.7.2.2. Are responsibilities and institutional arrangements for data collection and archiving clearly provided?	1,2	Yes. The project manager (PM) is responsible for the correct implementation of the monitoring plan. The PM will generate a monthly report which will be submitted to the company´s management. The PE will be the responsible of the management of all the practical work of the project concerning the monitoring activities, like data gathering, reporting to the PM, maintenance and calibration of the equipment, always assisted by the technicians in the plant. The technicians will be responsible for the daily operation and maintenance of the equipment concerning the monitoring plan.	**þ**	**þ**
B.7.2.3. Does the monitoring plan provide current good monitoring practice?	1,2	**Clarification Request No. 8.** The monitoring protocol mentioned in B.7.2. of the PDD should be submitted to the validation team.	**CR**	**þ**
B.7.2.4. If applicable: Does annex 4 provide useful information enabling a better under-	1,2	Yes.	**þ**	**þ**

standing of the envisioned monitoring provisions?				
B.8. Date of completion of the application of the baseline study and monitoring methodology an the name of the responsible person(s)/entity(ies)				
B.8.1.1. Is there any indication of a date when the baseline was determined?	1,2	Yes. The date of completion of the baseline is indicated.	**þ**	**þ**
B.8.1.2. Has dd/mm/yyyy format been used to indicate the date.	1,2	Yes.	**þ**	**þ**
B.8.1.3. Is this consistent with the time line of the PDD history?	1,2	Yes.		
B.8.1.4. Is the information on the person(s) / entity (ies) responsible for the application of the baseline and monitoring methodology provided consistent with the actual situation?	1,2	Zero Emissions Technologies SA (Spain, in person: Jose de la Camara) and Zeroemissions do Brasil (Brasil) are responsible for the application of the baseline and monitoring methodology. **Clarification Request No. 9.** Is the person responsible for the application of the baseline and monitoring methodology (Jose de la Camara) and indicated in B.8. still up-to-date? Please clarify.	**CR**	**þ**
B.8.1.5. Is information provided whether this person / entity is also considered a project participant?	1,2	**Corrective Action Request No.45.** Please provide information that both Zero Emissions Technologies SA and Zeroemissions do Brasil are project participants.	**CAR**	**þ**
C. Duration of the project activity / crediting period				
C.1. Duration of the project activity				
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	1,2, 38	Regarding project´s starting date, see B.5.13. The operational lifetime of the biodigester cover is 10 years and was evidenced by IRL 38. **Corrective Action Request No.46.** 1. Evidence for the lifetime of the flare as well as the physical-chemical treatment system equipment should be provided to the	**See CAR** **CAR**	**þ**

		validation team. 2. The operational lifetime in chapter C of the PDD should be revised to 10 years.		
C.1.2. How the starting date of the project activity has been determined and which evidence supports this start date has been delivered?	1,2, 16	See B.5.13.	**See CAR**	**þ**
C.2. Choice of the crediting period and related information				
C.2.1. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max. 10 years)?	1,2	The starting date of the fixed crediting period (10 years) is defined as 09 May 2009, which is however not reasonable as the period between submission for registration and start of the crediting period has to be at least 4 weeks. **Corrective Action Request No.47.** The start of the crediting period has to be revised to a more realistic date. Hereby the time for the whole validation process should be considered as well as the time for getting the Letters of Approval and the necessary 4 weeks period according to UNFCCC requirements between the date of submission for registration and start of the crediting period.	**CAR**	**þ**
C.2.2. Has dd/mm/yyyy format been used to indicate the start date of the crediting period.	1	Yes. The format dd/mm/yyyy is not completely correctly applied. **Corrective Action Request No.48.** 1. Please choose the correct format dd/mm/yyyy in indicating the start of the crediting period. 2. As the fixed crediting period has been chosen, the same should be indicated in chapter C.2.2. (Fixed crediting period) of the PDD and not C.2.1. (Renewable crediting period).	**CAR**	**þ**

D. Environmental impacts				
D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts				
D.1.1. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, has an EIA been approved?	1,2,7,9	According to Brazilian regulations, the proposed project activity does not require an EIA, however an Environmental Control Plan (IRL 7 and 9) which was presented to the validation team. A valid environmental installation license (IRL 8) was presented to the validation team which clearly shows that LAR is in compliance with the environmental legislation.	þ	þ
D.1.2. Has the analysis of the environmental impacts of the project activity been sufficiently described?	1,2,7,8	No significant negative environmental impacts are expected from the proposed project activity. The environmental control plan (IRL 7) mentions on page 42 some environmental impacts, however all not significant. Possible explosion risks from biogas storage or the possible methane leakages can be mitigated through the proper design and operation of the biogas storage and burning system and the regular monitoring and maintenance of the system.	þ	þ
D.1.3. Will the project create any adverse environmental effects?	1,2,7,8	No significant negative environmental impacts are expected from the proposed project activity.	þ	þ
D.1.4. Were transboundary environmental impacts identified in the analysis?	1,2,7,8	No significant negative environmental impacts are expected from the proposed project activity.	þ	þ
D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party				
D.2.1. Have the identified environmental impacts been addressed in the project design sufficiently?	1,2,7,8	No significant negative environmental impacts are expected from the proposed project activity. Possible explosion risks from biogas storage or the possible methane leakages can be mitigated through the proper design and operation of the biogas storage and burning system and the	þ	þ

		regular monitoring and maintenance of the system.		
D.2.2. Does the project comply with environmental legislation in the host country?	1,2,7,8	Yes. See D.1.1. **Corrective Action Request No.49.** The PDD should indicate in D.1. the environmental installation licence (date, environmental authority, number) showing that LAR is in compliance with the environmental legislation.	**CAR**	þ
E. Stakeholders' comments				
E.1. Brief description how comments by local stakeholders have been invited and compiled				
E.1.1. Have relevant stakeholders been consulted?	1,2, 22	E.1. of the PDD mentions all the people invited to the stakeholder meeting on February 19, 2009. However, see E.1.3.	**See CAR**	þ
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	1,2, 22	Yes. An announcement for the stakeholder meeting was published at Cooperativa Agroindustrial Lar´s website in February 2009. Besides, invitations for a stakeholder meeting held on February 19, 2009, were specifically sent to the stakeholders mentioned in E.1. of the PDD.	þ	þ
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?		The Brazilian DNA gives guidance how the local stakeholder process has to be conducted. According to resolution n° 7, from March 05, 2008, paragraph 1, "stakeholders have to be invited 15 days prior to the start of validation". Besides, the DNA defines which kind of stakeholders have to be at least invited. **Corrective Action Request No.50.** E.1. of the GSP PDD informs that "there is no requirement for conducting a stakeholder consultation process for this kind of project". This is not correct, once the DNA defines the minimum of stakeholders who have to be consulted and that the stakeholder process has to be carried out at least 15 days prior to the start of validation (resolution n° 7, from March 05, 2008, paragraph 1.). PPs are requested to revise and inform that the by the DNA requested stakeholders have been consulted.	**CAR**	þ

E.1.4. Is the undertaken stakeholder process that was carried out described in a complete and transparent manner?	1,2, 22	See E.1.3. The announcement at Cooperativa Agroindustrial LAR website as well as invitations to stakeholders (however not all requested by the Brazilian DNA) were presented to the validation team. Invitations took place via Email. **Corrective Action Request No.51.** The stakeholder letters of the Brazilian Forum of ONGs and Social Movements of the environment (Forum Brasileiro de ONG´s e Movimentos Sociais para o Meio Ambiente e Desenvolvimento) and State and Federal Public Ministries (Ministerio Publico Estadual and Ministerio Publico Federal) should be submitted to the validation team.	**CAR**	**þ**
E.2. Summary of the comments received				
E.2.1. Is a summary of the received stakeholder comments provided?	1,2, 22	Yes. Comments made during the stakeholders´ meeting were general and none was negative. No adverse comments were received regarding the proposed project activity.	**þ**	**þ**
E.3. Report on how due account was taken of any comments received				
E.3.1. Has due account been taken of any stakeholder comments received?	1,2, 22	Not applicable, as no negative comments were received.	**þ**	**þ**
F. Annexes 1 - 4				
F.1. Annex 1: Contact Information				
F.1.1. Is the information provided consistent with the one given under section A.3?	1	See A.3.3.	**See CAR**	**þ**
F.1.2. Is the information on all private participants and directly involved Parties pre-	1	Yes.	**þ**	**þ**

sented?				
F.2. Annex 2: Information regarding public funding				
F.2.1. Is the information provided on the inclusion of public funding (if any) in consistency with the actual situation presented by the project participants?	1,2, 13, 14	Yes. No public funding from Annex-I-countries is involved in the proposed project activity.	þ	þ
F.2.2. If necessary: Is an affirmation available that any such funding from Annex-I-countries does not result in a diversion of ODA?	1,2, 13, 14	Not applicable	þ	þ
F.3. Annex 3: Baseline information				
F.3.1. If additional background information on baseline data is provided: Is this information consistent with data presented by other sections of the PDD?	1,2	See F.3.3.	**See CR**	þ
F.3.2. Is the data provided verifiable? Has sufficient evidence been provided to the validation team?	1,2	See F.3.3.	**See CR**	þ
F.3.3. Does the additional information substantiate / support statements given in other sections of the PDD?	1,2	The information provided in Annex 3 not really helps to substantiate statements given in other sections of the PDD, as it is of very general character and not very project specific. **Clarification Request No. 10.** PPs should think about it whether the information provided in Annex 3 is really fundamental in order to support/substantiate statements given in other sections of the PDD. Different more project specific information could be provided here, like amongst others details about the calculation of the emissions factor.	**CR**	þ
F.4. Annex 4: Monitoring information				
F.4.1. If additional background informa-	1,2	Some additional information is provided in Annex 4 about data to	**CAR**	þ

tion on monitoring is provided: Is this information consistent with data presented in other sections of the PDD?		be monitored. **Corrective Action Request No.52.** The information should be updated as according to the requests stated in other relevant CARs.		
F.4.2. Is the information provided verifiable? Has sufficient evidence been provided to the validation team?	1,2	See F.4.1.	**See CAR**	**þ**
F.4.3. Do the additional information and / or documented procedures substantiate / support statements given in other sections of the PDD?	1,2	See F.4.1	**See CAR**	**þ**

Table 2 Resolution of Corrective Action and Clarification Requests

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
Corrective Action Request No.1. 1) 3 gen-sets are planned instead of 2 mentioned in A.2. Please revise. 2) PPs communicated during on-site visit that one part of electricity could not only be consumed for LAR´s internal purposes, but could be exported to the grid. PDD should be updated respectively.	A.2.3.	1) Three gen-sets will be installed. Two of 50kVA and one of 100kVA capacity. This configuration aims to increase the flexibility of the generation system. It has been corrected in the PDD in version 2. 2) The destination of the electricity generated with biogas in the project scenario has been explained in the PDD. Electricity generated by biogas gen sets will be used for internal purposes, this is consumed in Lar's facilities, or could be exported to the grid. This has been updated in the PDD.	1) A.4.2. of the PDD mentions now that two engines of 50 kVA (stage 1) and one engine of 100 kVA (stage 2) nominal capacity will be installed in the Industrial Chicken Unit of Lar with a total generation capacity of 160 kW. 2) Requested information regarding electricity export to the grid has been included into the PDD. It is clear now that electricity generated from biogas could be both used for internal consumption within LAR´s facilities and could be exported to the grid. CAR is closed. **þ**
Corrective Action Request No.2. The "Ltda." In Zeroemissions do Brasil Ltda. is missing in Annex 1. Please add.	A.3.3.	This has been corrected in version 2 of the PDD.	The correction has been provided. CAR is closed. **þ**
Corrective Action Request No.3. Please revise the GPS coordinates as per the on-site measurements and indicate in A.4.1.4. from which exact locations the GPS	A.4.1.1.	The GPS coordinates were taken during the site visit with a GPS device. Coordinates, accuracy and the exact place in which those were taken have been included in the PDD in section A.4.1.4.	GPS coordinates of the location between lagoons 1 and 2 (new biodigesters) have been indicated in A.4.1.4. of the

coordinates were taken.			PDD. CAR is closed. þ
Corrective Action Request No.4. Information should be provided in A.4.2. of the PDD whether the proposed project activity requires any technology transfer from Annex-I countries.	A.4.2.4.	No technological transfer from Annex 1 countries is involved in the development of the project activity. This statement has been included in section A.4.2. of the PDD. **2nd answer:** it has been mentioned in the PDD that the equipment will come from Brazil or, if coming from another country, it will be a technology which is available in Brazil, so it will not involve a technological transfer. The suppliers for the main equipment, those already contracted in the moment of validation, have been included in the PDD in section A.4.2.	Even though it is clearly stated now in A.4.2. that no technological transfer from Annex 1 countries is involved, it should be mentioned whether the whole project equipment including monitoring instruments come from Brazil and the most important equipment suppliers should be mentioned in the PDD. **2nd answer:** It is clear now according to information provided in A.4.2. that all equipment including monitoring instruments are available in the Host Country. The most important equipment suppliers have been mentioned in the PDD. CAR is closed. þ
Corrective Action Request No.5. Referring to chapter A.4.2., the following items should be considered: 1. Figure 3 should add 2 polishing lagoons as it was validated during the on-site visit. 2. The description of HDPE and PVC for the biodigester cover should be revised.	A.4.2.6.	1. Figure 3 of version 2 of the PDD includes the two existing polishing lagoons. 2. It has been revised in the PDD the configuration of both biodigesters. The following table has been included in the PDD. **Cover** | **Bottom**	1. 2 polishing lagoons have been added in Figure 3 of the PDD. 2. Description has been revised. 3. Aerated lagoons are clearly defined now as

3. In the case aerobic lagoons are at the same time aerated, the same should be clearly mentioned. 4. Please revise the aeration equipment in A.4.2. as it was communicated during the on-site visit. 5. Figure 5 should be revised as the aerated lagoons after the physical-chemical flotation system are serial and not partly serial and partly parallel. 6. The engine configuration should be revised as it was communicated during the on-site visit.			such ones. 4. Aeration equipment is now clearly indicated both for stages 1 and 2. 5. Aerated lagoons after the physical-chemical flotation system are illustrated as serial now. 6. The engine configuration has been revised and is now according to the information provided during the on-site visit. CAR is closed. **þ**

Biodigester 1	HDPE 0.80 mm	HDPE 1.25 mm
Biodigester 2	PVC 1.00 mm	-

3. Lagoons in the project boundary which have an aeration system have been renamed as “aerated” with the aim of avoiding misunderstandings. Lagoons without aeration systems but in which the organic decomposition does not follow anaerobic degradation (depth < 2m and low retention times) are considered “aerobic”. No aerobic lagoons are included in the project boundary.

4. The aeration equipment has been corrected in the PDD and in the CER calculation sheet.

The aeration equipment to be installed in the project activity is summarized in the following tables:

Stage 1			
	nº	Power (HP)	Power (kW)
Agitation pumps	2	10	14.7
Aeration equipment in aerated lagoons			
Aerated lagoon 1	2	7.5	11.025
	1	20	14.7
Aerated lagoon 2	4	15	44.1
	2	20	29.4
Distribution losses	10%		11.3925
		Total	125.3175

Stage 2

	nº	Power (HP)	Power (kW)
Agitation pumps	2	10	14.7
Aeration equipment in aerated lagoons			
Aerated lagoon 1	2	7.5	11.025
	1	20	14.7
Aerated lagoon 2	4	15	44.1
	1	20	14.7
Aerated lagoon 3	2	7.5	11.025
	1	20	14.7
Distribution losses	10%		12.495
		Total	137.445

<table>
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<td>The aeration equipment in lagoons 1&2 refers to a more efficient aeration, which is supported by the proposal from PlanoA. The installed capacity of this equipment and, thus, their electricity consumption, is less than the foreseen in the Environmental Control Plan. This is due to the higher efficiency of aeration and oxygen transference.
The following table refers to the biogas fuelled engines and has been included in section A.4.2.4 of version 2 of the PDD.

<table>
<tr><td>Biogas Engines</td><td>Installed Capacity</td></tr>
<tr><td>Stage 1</td><td>2 x 50 kVA</td></tr>
<tr><td>Stage 2</td><td>1 x 100 kVA
(and the previously installed 2x50kVA)</td></tr>
</table>

5. Firgure 5 in version 2 of the PDD has been revised. Aerated lagoons have been correctly indicated in this figure. Also and although the tertiary treatment and the solid wastes treatment has been included in figure 5 of version 2 of the PDD.
6. The engine configuration has been updated in the PDD. A diagram of this configuration has been included in figure 16 of section B.7.2.</td>
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<td><u>Corrective Action Request No.6.</u>
A project implementation schedule about the most important implementation steps should</td>
<td>A.4.2.11.</td>
<td>The schedule estimated for the implementation of both stages of the project activity has been included in section A.4.2 of the PDD. This schedule was discussed</td>
<td>The project implementation schedule has been submitted to the validation team and</td>
</tr>
</table>

be presented to the validation team and the same should be included into the PDD.		and agreed with the project promoter during the site visit. The same project implementation schedule has been submitted to the validator in excel format. Also, the delays estimated over this schedule by the Project Owner in the implementation of both stages of the project activity have been submitted to the validation team and were considered in the PDD.	deems to be reasonable in the opinion of the validation team. The schedule has been included into the PDD and considers already communicated delays during project implementation. CAR is closed. **þ**
Corrective Action Request No.7. It should be mentioned in A.4.4. that about 18% of the total investment volume will be financed by FINEP, and the remaining 82% by LAR´s own equity capital.	A.4.4.1.	It has been mentioned in version 2 of the PDD the following: Out of the total investment for the implementation of the project activity, FINEP finances the 17.9%. Cooperativa Lar will face the remaining investment with equity capital, reaching 82.1% of the total investment."	Requested information has been added. CAR is closed. **þ**
Corrective Action Request No.8. 1. There is no sludge for land application in the proposed project activity (according to information obtained during the on-site visit), but sludge will pass through a thermal treatment (in boiler, tri-decanter). Please make that clear in Figure 7 of the PDD and explain in B.3. the kind of sludge treatment to be implemented. 2. Sludge treatment should be included into the project boundary (refer to §13, AMS III.H. and §3(c), AMS III.I.). 3. Please make clear in the project boundary diagrams which of the lagoons are aerated lagoons. 4. Regarding the 2nd stage: The 3 aerobic	B.3.1.	**1&2.** Sludge destination has been corrected in the PDD. In the first stage of implementation, treated water with high organic matter content, is used for fertilizing irrigation of the eucalyptus in the nearby zone. In the second stage of implementation the project proponent distinguishes between sludge produced in the wastewater treatment and solid sizeable matter separated in the tridecanter. **Sludge is defined as the concentrated, semi-liquid waste left after treatment of wastewater.** In the baseline situation, deactivated (without organic activity) sludge arrives in the polishing lagoons together with treated water and is used for fertilizing irrigation. These polishing lagoons are not affected by the project activity.	1. According to the information provided by LAR during the on-site visit, no sludge will be used for land application in the project activity (however as feedstock), thus it is not retraceable to the validation team if PPs say that "in the first stage, sludge destination is the same that in the baseline this is, fertilizing irrigation". Besides, it is not retraceable to

aerated lagoons after the physical-chemical flotation system are serial. Please correct.		**In the first stage of implementation**, the configuration of the last steps of the treatment remains the same. After the existing aerated lagoon, which is the discharge site for wastewater (in terms of CDM project activity scope), the facultative and polishing lagoons remain the same. Sludge remains dissolved in treated water and it is finally used for fertilizing irrigation, but there is no sludge separated treatment or disposal. Hence, no sludge treatment could be included in the project boundary since it does not exist and the final destination of treated water is the same as in the baseline situation. **In the second stage of implementation** of the project activity, there is a separated step for treating the sizeable solid matter extracted from the PCF tank. These solid wastes cannot be considered as sludge due to the following reasons: a. These wastes consist of solid matter not treated by the wastewater treatment plant. The wastes have, at the extraction point, have passed through the flotation tank and the PCF tank and are immediately extracted. Thus, they are not a product of the wastewater treatment. b. The organic decomposition of these solid wastes does not take place in the homogenization tank neither in the PCF tank. Hence, it cannot be considered as "treated" matter, but only separated by density. c. The treatment process of this solid matter is not a "sludge treatment process". It does not consist of the dehydration of sludge, but a simple separation in three	the validation team why there should be no sludge treatment once LAR communicated during the on-site visit that sludge will pass through a thermal treatment (in boiler, tri-decanter). PPs are requested to clarify. 2. See item 1. 3. The project boundary diagram clearly shows now which of the lagoons are aerated lagoons. **Þ** 4. Regarding the 2nd stage: The 3 aerobic aerated lagoons after the physical-chemical flotation system are placed serial now. **Þ** **2nd answer:** PPs clarified now that in the first stage, the sludge resulting from wastewater treatment flows (already deactivated and without organic activity) together with water into the facultative and polishing lagoons (the same as

		phases: solids, oils and water, based on density and without any special feature for separating the liquid and solid phases. Hence, this step cannot be strictly considered a sludge treatment, but a solid-liquid separation stage (by density gradient). **According to the above explained, the separation of solid matter in stage 2 of the project activity cannot be considered as a sludge treatment and, thus, remains out from the project boundary.** Regarding the sludge resulting from the secondary decanter after the aeration treatment, the total amount of generated sludge is redirected to the homogenization tank at the beginning of water treatment, without being treated. No sludge treatment (dehidratation, filtration or other) occurs in the second stage of the project implementation because there is no surplus production of sludge. Neither sludge disposal occurs in this stage of the project implementation. As per the explanation above, the project proponent considers that no sludge treatment has to be included in the project boundary as: (a) in the first stage, sludge destination is the same that in the baseline, this is, fertilizing irrigation, and there is no sludge treatment in the baseline or in the project scenario.	in the baseline scenario). This treated water, very rich in nutrient substances, is used for land application. Furthermore it was clarified, that in the baseline scenario, solids and oils are already separated in the initial stage of the treatment. This, in the baseline situation, occurs in the existing flotation tank and has been checked during the on site visit. The main difference is that, in the project situation, the separation process is improved by the installation of a three phase decanter. Besides, it has been clarified why no "classical sludge treatment" takes place. The validation team accepts the given answers. CAR is closed. **þ**

		(b) In the second stage, the solids separated from wastewater in the flotation tank cannot be considered sludge (see the explanation above) and the sludge produced due to the wastewater treatment is redirected to the beginning of the treatment system. Treated water from the secondary decanter is poured into the polishing lagoon, exactly as it happens in the baseline scenario. This cannot be considered a sludge treatment and, hence, has not been included in the project boundary. 3. All figures in the PDD have been modified in order to clearly show which of the lagoons are aerated. 4. All diagrams referring the second stage of implementation have been corrected; aerated lagoons are properly indicated in every figure. **Answer 2:** In the first stage of implementation, no modifications will take place after the aerated existing lagoon in the project scenario. According to the AMS III.H, "t*he treatment systems not affected by the project activity, i.e. sections operating in the project scenario under the same operational conditions as in the baseline scenario shall be described in the PDD, but emissions from those sections do not have to be accounted for in the baseline and project emission calculations",* The PP has described each and every treatment system in the plant, but included in the boundary only the systems affected by the project activity.	

		In the baseline situation, as explained in the PDD, the sludge resulting from wastewater treatment flows (already deactivated and without organic activity) together with water into the facultative and polishing lagoons. This water, very rich in nutrient substances, is used for land application. Since the application does not involve any GHG emissions (there is no anaerobic decomposition due to fertilizing irrigation), there are no emissions related to this rich-in-organic-matter-water disposal. In the first stage of implementation there is no separation nor any modification of this final step in the wastewater treatment. The only possible change from the baseline is that water arriving to polishing lagoons will very probably have a lower organic load than in the baseline. This water rich in deactivated organic matter will be used for fertilizing-irrigation. In the second stage of implementation, the final step of the treatment is also modified with respect to the current situation, but there is no CDM methodology applicable to this modification, so no emission reduction is considered. Facultative lagoons disappear and irrigation lagoons receive only 30% of the treated water. The other 70% of treated water is sent disinfection and for reuse. Some sludge is generated from the settling process in the secondary decanter, after the aeration lagoons. However, this sludge is pumped without being stored to the initial stage of the treatment, not being treated separately. The reason of re-pumping this sludge is to enhance the biological activity of bacteria in wastewater, which is necessary for a proper organic matter removal in the aeration lagoons. Apart from this sludge, after the disinfection process, some amount of sludge is	

		generated. This is also sent to the initial stage of the wastewater treatment and no specific sludge treatment is required. There is a physical separation of solids and oils in the physical chemical flotation tank. This matter is directed to an evaporation tank where most of the water content is evaporated and sent to the wastewater treatment, and the outlet matter is treated with centrifugal forces in a three phase decanter (a centrifugal pump able to separate solid from liquid phase and two liquids with different densities, by means of centrifugal forces). Liquid phase is separated in greases and water, being water re-directed to the treatment and being grease stored. Solid phase is used for animal feedstock. This separated matter could be confusing and considered primary sludge. However, for being sludge (according to the definition from the United Nations Environment Programme, Division of Technology, Industry and Economics), there should exist a settling process in the generation of this matter, which does not exist. Hence, this confusion is not possible. This has been indicated in version 3 of the PDD and the separation process has not been included in the project boundary. Moreover, Cooperativa Lar, in the baseline scenario, is already separating solids and oils in the initial stage of the treatment. This, in the baseline situation, occurs in the existing flotation tank and was checked during the site visit. The main difference is that, in the project situation, Cooperativa Lar improves the separation process by the installation of a three phase decanter in the tertiary treatment.	

		The sizeable solids separation takes place in all the stages of the project: baseline, first stage and second stage of implementation, before wastewater entries the treatment.	
Corrective Action Request No.9. In chapter B.3. it should be clearly explained which parts of the treatment system will be affected and which not. According to §14 of AMS III.H., "the assessment and identification of the systems affected by the project activity will be undertaken ex ante, and the PDD shall justify the exclusion of sections or components of the system".	B.3.2.	In chapter B.3 it has been clearly indicated which parts of the treatment system are included in the project boundary. Regarding the inclusion of the sludge treatment in the project boundary, please refer to the reply to CAR 8. Answer 2: The PP is only claiming for the ER resulting from the destruction of methane in the biogas engines. The recovered biogas will be sent to the flaring system or to the engines for electricity generation. The PP, since is not accounting the ER resulting from biogas flared in the torch and in order to be conservative, has considered that no biogas is destroyed in the flare. Hence, the biogas not combusted for power generation is assumed to be released to the atmosphere in a conservative approach, although it will actually be combusted in the flare. According to this, the PP considers that the biogas flare is not included in the project boundary.	1. It should be clarified why the flaring system is not part of the project boundary. 2. Regarding the inclusion of sludge treatment into the project boundary, see CAR 8. 3. The systems affected and not affected by the project activity shall be still described in the PDD according to Paragraph 14 of AMS III.H. **2nd answer:** 1. It has been transparently and in a retraceable way explained by the PPs why the flaring system makes not part of the project boundary. The explanation is accepted by the validation team. 2. See answer in CAR 8. 3. The systems affected and not affected by the project activity are clearly described now in B.3. of the PDD. CAR is closed. **þ**
Corrective Action Request No.10. 1. The baseline scenarios according to AMS	B.4.1.	Baseline scenario alternatives have been considered in the PDD according to EB50 guidelines (Indicative sim-	1. Baseline scenario alternatives have been considered

III.H, AMS III.I and AMS I.D. have to be clearly explained in B.4. of the PDD including all baseline scenario alternatives in the case if applicable. The baseline scenario should consider the increase of the wastewater inflow due to plant production capacity increase (see for this "Indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories" version 12.1 (EB50), paragraph 16 and the application of the most recent version of the Combined Tool) 2. It should be evidenced that open anaerobic lagoon systems are the baseline scenario in the Host Country/region where the proposed project activity is located.		plified baseline and monitoring methodologies for selected small scale CDM project activity categories", version 12.1, paragraph 16), in order to consider the wastewater inflow capacity increase in the baseline establishment. Those alternatives are: 1. Continuation with the existing treatment without making any modification. 2. Continuation with the current philosophy of wastewater treatment, based in anaerobic open lagoons and subsequent aerated, facultative and polishing lagoons and install new open anaerobic, facultative and polishing lagoons in the nearby zone in order to receive the increased wastewater flow and maintain the minimum retention time required for removing the same COD amount than in the current situation 3. Installation of aeration equipment in the existing anaerobic lagoons: 4. Implementation of the project activity without the CDM: The conclusion is that, in the absence of the benefits from CDM, Cooperativa Lar would have decided to excavate more lagoons in the nearby zone in order to increase the overall volume of the anaerobic treatment in open lagoons, thus maintaining enough retention time to guarantee a proper COD, SS and BOD_5 removal. Answer 2: References supporting a baseline of anaerobic lagoons in poultry processing industry in Brazil have been included in the PDD and submitted to the validation team. "2006 IPCC Guidelines for National Greenhouse Gas Inventories". Chapter 6. Wastewater Treatment and	in the PDD now as per "Indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories" version 12.1 (EB50), paragraph 16 and the most recent version of the Combined Tool at the time of validation. Step 1 and 2 of the Combined Tool have been applied in the PDD (step 3 was not applied, as step 2 (barrier analysis) is already sufficient for demonstrating the baseline scenario). The alternative "Continuation with the existing treatment without making any modification" is not realistic and not in compliance with the law since the existing treatment is not sized for a wastewater flow of 350m3/h (2^{nd} stage of the project activity). Organic load would not be properly removed due to too short retention times and water would be discharged with high COD, SS and BOD_5. which are beyond permissible discharge values defined by the legislation. The alternative "Installation of aeration

		Discharge. Page 20. *"The meat and poultry processing facilities typically employ anaerobic lagoons to treat their wastewater"* "Brazil Profile for Animal Waste Management" Methane to Markets Agriculture Subcommittee, December, 2006 http://www.methanetomarkets.org/resources/ag/docs/brazil_profile.pdf *"Currently, anaerobic lagoons correspond to the baseline for CDM projects based on mitigation of greenhouse gases from animal wastes management systems"* "Fiscal 2006 CDM/JI Project Research Swine Farms in the State of Santa Catarina, Brazil". The Japan Research Institute. March, 2007. http://gec.jp/gec/gec.nsf/3d2318747561e5f549256b470023347f/0af2af9a8f44acab4925730d002ebb86/$FILE/Summary_JapanResearch.pdf *"Identification of alternative scenarios for proposed CDM project activities:* *There are two alternative methods that can be considered, namely the "anaerobic lagoons" that are generally used in Brazil, and "anaerobic digesters", which are more advanced but rarely adopted.* *Barrier Analysis: Substantial investment is needed for anaerobic digesters, and detailed monitoring and system maintenance need to be performed. On the other hand, anaerobic lagoons represent simple and inexpensive technology, with straightforward operation and*	equipment in the existing anaerobic lagoons" is not considered neither a plausible nor realistic alternative due to high investment costs, a very complex O&M and not foreseeable operational difficulties and problems. It has been explained in a traceable way by the PPs during the on-site visit why the two above mentioned alternatives are not plausible and realistic. Due to its sectoral and local expertise and the arguments given by the PPs during the on-site visit as well in the final PDD, the validation team confirms that the two above mentioned alternatives are not baseline scenarios. The alternative "Implementation of the project activity without the CDM" is neither plausible nor realistic as savings in electricity consumption and possible revenues from electricity sales are by far not enough to make the project financially attractive. See chapter 3.6.4. of the validation report describing the assessment of the investment analysis and of the

		maintenance. Anaerobic lagoons should be installed as the baseline scenario from the perspective of both investment and technological barriers". "Treatment and control of industrial effluents". Engo. Gandhi Giordano, D.Sc, Prof. Adjunto do Departamento de Engenharia Sanitária e do Meio Ambiente – UERJ Diretor Técnico da Tecma-Tecnologia em Meio Ambiente Ltda. http://www.ufmt.br/esa/Modulo_II_Efluentes_Industriais/Apost_EI_2004_1ABES_Mato_Grosso_UFMT2.pdf "The processes largely developed in Brazil consist in up to three stages: preliminary, primary and secondary: Ø Preliminary: sieving for entrail removal, grease separation. Ø Secondary: lagoons – use of a serial of anaerobic, facultative and algae lagoons. In case that no space was available for the implementation of lagoons, the preliminary process would be completed with an equalization tank, a physical chemical flotation and a biologic treatment with activated sludge."	relevant parameters and explaining why this alternative is not the baseline scenario. The baseline scenario is determined to be the "Continuation of the wastewater treatment based in anaerobic open lagoons and subsequent aerated, facultative and polishing lagoons as well as the construction of new open anaerobic lagoons and facultative and polishing lagoons in the nearby zone in order to receive the increased wastewater flow and in order to maintain the minimum retention time required for removing the same COD amount as in the current situation." The validation team confirms that the identified baseline is reasonable and is in compliance to the statements given during the on-site visit. The land in the nearby zone to the industrial plant belongs to Cooperativa Lar. Thus, there is enough space to open new anaerobic lagoons. This was verified during the on-site visit by visual inspection and official land registry (IRL 24).

			The baseline scenario is in compliance with the applied methodologies and with the Brazilian legislation**.** Besides, there is no obligation by the Brazilian federal or state legislation to change the wastewater treatment from anaerobic to aerated nor to recover the generated biogas during anaerobic degradation of wastewater nor to use that biogas as an energy source for electricity generation. This has been verified by the validation team by checking the sources mentioned in footnote 9 of the PDD as well as through an interview with a technician in agricultural and industrial licensing of Paraná Environmental Institute IAP (IRL 2). **þ** 2. The respective requested evidence(s) should be still submitted to the validation team. **2nd answer:** Declarations of both AVESUY (the supplier of the biodigester system) (IRL 115) and Gratt Industria de Maquinas Ltda, an experienced

			technological provider for aeration equipment for water treatment (IRL 114) confirmed that anaerobic open lagoon systems are the common practice in poultry slaughterhouses in the State of Parana. This was cross-checked by consulting IAP (Paraná Environmental Institute) and confirmed by an Email received on 09/01/2010 from the Technician in agricultural and industrial licensing (IRL 116). According to the described documents and the sectoral and local expertise of the validation team, the DOE confirms that the 'the proposed project activity undertaken without being registered as CDM', is not the common practice in the region and thus the given methodology can be applied as per the "Indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories" version 12.1 (EB50), paragraph 16. . Besides, various evidences (amongst others IRL 44,85,86,87) have been

			submitted to the validation team confirming the baseline scenario. The documents substantiate evidences for the baseline scenario for LAR project submitted during on-site visit (IRL 9, 27,30,48). CAR is closed. **þ**
Corrective Action Request No.11. B.6.1. should explain which and why certain baseline emissions are not applicable to the proposed project activity.	B.4.5.	It has been explained in section B.6.1 why certain baseline emissions are not applicable to the proposed project activity.	The PDD informs now in B.6.1., that baseline emissions from sludge treatment are not considered, because there is no sludge treatment in the baseline scenario. CAR is closed. **þ**
Corrective Action Request No.12. 1. The project´s starting date should be modified to June 20, 2008 as on this date the first significant financial commitment (due to first ground preparation works) took place. 2. The evidence of CDM consideration (IRL 18) should be submitted in its most important parts in English language to the validation team. 3. B.5. of the PDD should include an explanation (including a timetable) how CDM was considered and indicate actions to evidence that continuing and real actions were taken to secure CDM status.	B.5.13.	1. The project starting date has been modified. The project proponent has considered as starting date of the project activity the date in which the ground preparation works started, on June, 20th, 2008. 2. The evidence of CDM consideration has been translated and sent to the validator. It has also been included in the PDD in section b.5. *"It has to be mentioned the possibility of this programme to be eligible under Clean Development Mechanism (CDM) and, this way, receive additional carbon credits due to the methane emissions reduction to the atmosphere, being methane a constituent of biogas and with a greenhouse gas effect twenty one times larger than carbon dioxide".*	1. The project´s starting date has been, as requested, modified to June 20, 2008. **þ** 2. The evidence for CDM consideration has not been submitted in English language yet. PPs are requested to submit the most important parts in English language. 3. B.5. indicates now an explanation how CDM was considered and indicates actions to evidence that continuing and real actions were taken to secure CDM status. **þ**

		"Há também que se mencionar a possibilidade desse modelo ser elegível para efeitos do Mecanismo de Desenvolvimento Limpo (MDL) e desta forma, receber adicionais créditos de carbono como uma função da redução de emissão de gás Metano, constituinte do biogás e com vinte e uma vezes mais poder de efeito estufa do que o gás Carbônico". The document referenced was submitted to the validator during the site visit. A soft copy has been attached to this Validation Protocol. 3. A chronology of actions taken for the development of the proposed project under CDM has been included in section B.5 of the PDD. **Answer 2:** The evidence has been translated into English (the most important parts) and both, original and translation, have been submitted to the validator.	**2nd answer:** The evidence for CDM consideration has been translated into English (the most important parts) and has been received by the validation team. CAR is closed. þ
Corrective Action Request No.13. An implementation timeline of the proposed project activity should be included into the PDD indicating date of the investment decision, start of the construction works, start of commissioning, start up.	B.5.14.	A estimated schedule of the implementation of the proposed project activity has been included in section A.4.2 of the PDD. In table 1 of the PDD it has been specified the estimated date in which each stage will start operation, according to flow increases expected. Stage 1 of implementation is expected to start operating in June 2010 with the current treated flow of 150m^3/h. Stage 2 of implementation will imply the start of operation of all equipment installed in the proposed project	An implementation timeline of the proposed project activity has been included into the PDD indicating the most important implementation steps. CAR is closed. þ

		activity (final configuration of the project). This is expected to start on August 2010 with a flow under peak flow. Wastewater flow will increase progressively up to peak flow, which is expected to be reached in August 2011. The same schedule has been submitted to the validator.	
Corrective Action Request No.14. 1. Concrete evidences for barriers presented in the PDD should be presented to the validation team, in order to verify the barriers presented in the PDD. Besides, the most important evidences have to be submitted to the CDM-EB. 2. The additionality discussion should consider the increase in wastewater flow due to the planned capacity increase.	B.5.19.	The evidences for the barriers presented have been concreted and expanded in the PDD. Documents supporting these barriers have been submitted to the validator and referenced in the PDD. The additionality discussion considers, in version 02 of the PDD, the increase of production and the consequent increase in wastewater flow to be treated. **Answer 2:** A comparative analysis of financials has been submitted to the validation team and included in the PDD. An estimate budget for the excavation of the lagoons necessary for the treatment of the inflow stream has been submitted to the validator. A budget for the construction and implementation of the rest of the project activity has been submitted to the validator. The evidences for the costs and investment needed for the implementation of the project activity were provided to the validator during the site visit. A summary of the main investments and costs related to the implementation of the project activity, have been	The footnotes in B.5. have to be all translated into English. The title of the referenced document should be indicated in the original language as well as in English. -Regarding investment barrier: a) Some more concrete evidences should be delivered to the validation team like e.g. declaration of technology provider about costs of equipment per m^3 of installed digester, costs for the excavation of anaerobic lagoons, invoices, evidences for high O&M costs, financial analysis and the need for specialized personnel etc. In the case no more concrete evidences can be provided, the investment barrier should be removed. - The statement “But, also, if electricity generation from

		included in the PP's response. Barriers supporting the prevailing practice in Brazil have been included in the PDD and submitted to the validator. "2006 IPCC Guidelines for National Greenhouse Gas Inventories". Chapter 6. Wastewater Treatment and Discharge. Page 20. *"The meat and poultry processing facilities typically employ anaerobic lagoons to treat their wastewater*" "Brazil Profile for Animal Waste Management" Methane to Markets Agriculture Subcommittee, December, 2006 http://www.methanetomarkets.org/resources/ag/docs/brazil_profile.pdf *"Currently, anaerobic lagoons correspond to the baseline for CDM projects based on mitigation of greenhouse gases from animal wastes management systems"* "Fiscal 2006 CDM/JI Project Research Swine Farms in the State of Santa Catarina, Brazil". The Japan Research Institute. March, 2007. http://gec.jp/gec/gec.nsf/3d2318747561e5f549256b470023347f/0af2af9a8f44acab4925730d002ebb86/$FILE/Summary_JapanResearch.pdf *"Identification of alternative scenarios for proposed CDM project activities:* *There are two alternative methods that can be considered, namely the "anaerobic lagoons" that are generally*	biogas was doubled from the initially planned (which is a possibility that has been considered by the project proponent), hence 0.32 MW installed, the amount of electricity generated could never be enough to make the proposed project financially profitable" should be confirmed in a more transparent way by e.g. doing a financial analysis. -Some of the submitted evidences refer to stabilization lagoons (Table 9 of the PDD mentions that their function is the "natural supply of oxygen"), however it is not clear to the validation team in what relationship the same are with the baseline scenario of the project activity (anaerobic lagoons). PPs are requested to clarify and submit some real evidences for anaerobic lagoons. -Regarding prevailing practice barrier: It has not been sufficiently evidenced yet that a prevailing practice barrier exists. A concrete evidence has to be

		used in Brazil, and "anaerobic digesters", which are more advanced but rarely adopted. *Barrier Analysis: Substantial investment is needed for anaerobic digesters, and detailed monitoring and system maintenance need to be performed. On the other hand, anaerobic lagoons represent simple and inexpensive technology, with straightforward operation and maintenance. Anaerobic lagoons should be installed as the baseline scenario from the perspective of both investment and technological barriers".* "Treatment and control of industrial effluents". Engo. Gandhi Giordano, D.Sc, Prof. Adjunto do Departamento de Engenharia Sanitária e do Meio Ambiente – UERJ Diretor Técnico da Tecma-Tecnologia em Meio Ambiente Ltda. http://www.ufmt.br/esa/Modulo_II_Efluentes_Industriais/Apost_EI_2004_1ABES_Mato_Grosso_UFMT2.pdf "The processes largely developed in Brazil consist in up to three stages: preliminary, primary and secondary: Ø Preliminary: sieving for entrail removal, grease separation. Ø Secondary: lagoons – use of a serial of anaerobic, facultative and algae lagoons. In case that no space was available for the implementation of lagoons, the preliminary process would be completed with an equalization tank, a physical chemical flotation and a biologic treatment with activated sludge." The references sent to the validation team show that	submitted that demonstrates that the "project is among the first of its kind in terms of technology, geography, sector, type of investment and investor, market etc" (see Annex 34 Non binding best practice examples to demonstrate additionality for SSC project activites". -Other barriers: No really concrete evidence has been presented to the validation team to substantiate this barrier. Either an evidence will be presented or the barrier should be removed. **2nd answer:** -Regarding investment barrier: More concrete evidences have been submitted to the validation team including a comparison analysis has been done between the baseline scenario considering the increase in wastewater flow due to the planned capacity increase and the proposed project activity. However, some clarifications are still necessary: 1. Some significant ex-

		the prevailing practice in Brazil is the use of anaerobic lagoons for wastewater treatment in the poultry industry. Other barriers support the use of these technology in the wastewater treatment in other animal waste management systems. These references have also been included in the PDD and sent to the validator. **3rd Answer:** 1. The following invoices/quotations (in case of methane analyzer) have been submitted to the validation team: Invoices, N° 0021, 0043, 0045: diffusers in aeration lagoon. Invoice for biogas generator. Invoice nº 00237 Invoice for biogas generator. Invoice nº 00245 Invoices nº 219 (Manpower for biogas pipeline execution) & 220 (Execution of biogas generators warehouse). Invoice nº 0021. Environmental consultancy. 10% of the total value Invoice nº 0043. Environm. Consultancy. 40% of the total value Invoice nº 0045. Environm. Consultancy. 50% of the total value Invoice nº 6200 from Avesuy Invoice nº 6211 from Avesuy Invoice nº 6218 from Avesuy Invoice nº 6235 from Avesuy Invoice nº 6311 from Avesuy Invoices for adequation works in lagoon 1 Invoices for adequation works in lagoon 2	penses for the project activity have not been evidenced yet (like diffusers aerated lagoon, anaerobic lagoon cleaning and adaptation, two biogas generators, manpower for biogas pipeline execution, execution of biogas generators warehouse, environmental consultancy, adaptation of electrical facilities, centrifugal pump, methane analyser, PVC pipeline, excavation works, geomembranes). 2. It should be clarified how the electricity price applied in the investment analysis (project activity) was determined. Respective evidence should be provided. 3. The evidence for the price for electricity exported should be submitted to the validation team as well as

		Invoice nº 1300. Adaptation of electrical facilities Invoice nº 0993. Centrifugal pump Quotation for Methane Analyser nº 2964 2. Electricity invoices: electricity invoices for electricity purchased from the grid by Cooperativa Lar from September 2008 until August 2009. The highest peak and non-peak tariffs (0.77478 R$/kWh and 0.12395 R$/kWh respectively) of this period have been taken for the financial analysis and were moreover adjusted by the average increase over that period for the whole crediting period. 3. Purchase agreement extract between COPEL and Cooperativa Lar for decentralized generation: supporting the price of electricity exported to the grid by Cooperativa Lar and Notification from the Brazilian Communication Company „Forecast inflation for 2010 is slightly higher“: Forecast for inflation rate in Brazil. This rate supports the price evolution used in the investment comparison analysis. (http://www.agenciabrasil.gov.br/noticias/2009/11/23/materia.2009-11-23.7938623086/view) . 4. Budget for lagoons excavation Jamar:: second quotation for the excavation of new anaerobic lagoons in the baseline scenario. 5. In the final investment comparison analysis, the following assumptions have been considered in order to make the most conservative approach possible:	the document which was used for the tariff increase during the crediting period. 4. Some cross-check evidence for the excavation budget (Paulo Colpo Projetos Industriais Ltda) of anaerobic lagoons in the baseline scenario should be submitted to the validation team. 5. The assumptions made in the final investment analysis should be clearly described by the PPs. 6. It should be justified /explained why for the capacity increase 3 anaerobic lagoons, 3 facultative lagoons and 2 polishing lagoons are sufficient. 7. Equipment consumption is slightly different to the one used for the PE calculation. Please clarify this inconsistency. Regarding prevailing practice

		Ø There are three tariffs to be considered: Ø 1. Purchase from the grid at non peak hours; Ø 2. Purchase from the grid at peak hours; Ø 3. Sale to the grid as per the Agreement between Lar and the electricity dealer. Ø Peak tariff is applicable 3h/day. Non peak tariff is applicable 21 h/day; Ø Cooperativa Lar could export electricity to the grid. The tariff for electricity sold to the grid is considered in accordance with the purchase agreement between Cooperativa Lar and the electricity dealer; Ø The peak tariff for electricity purchased from the grid is the highest of the three considered tariffs. During the 3 hours per day of peak tariff, Cooperativa Lar will use the electricity generated in the biogas fed engines for self consumption. With this consideration, Coopeativa Lar will consider a reduction in the electricity consumption during the peak hours; Ø The non peak tariff for electricity purchased from the grid is lower than the price that the electricity dealer would pay for the electricity generated through biogas combustion in engines. Hence, during non-peak hours (21h/d) it will be considered in the investment analysis that Cooperativa Lar will sell all the electricity generated to the grid and will purchase the amount of energy required for project equipment operation. Hence, with these assumptions, the only incomes in the	barrier: -It should be explained in the PDD what is meant under stabilization lagoons. Are the same anaerobic lagoons? Respective evidence should be submitted. -Real evidences for the prevailing practice barrier should be still submitted to the validation team. The submitted evidences refer more to the baseline scenario than to the prevailing practice barrier. -Other barriers should be substantiated by at least one more evidence. **3rd answer:** 1. All requested invoices have been submitted to the validation team. The same have been verified for authenticity and credibility and have been included into the IRL. **þ** 2. Electricity invoices from September 2008 until August 2009 (IRL 54) from LAR´s imported grid electricity have been submitted to the validation team. The

		proposed project activity, come from electricity savings and export to the grid. In order to be as conservative as possible, the project participants have made a complete analysis of the possible incomes from this energy generation considering the following parameters and considerations. This analysis is included in the Final Investment Comparison Analysis which has been sent to the validation team. In the moment of the validation, the information about electromechanical equipment to be installed in the project activity, was not completely closed. In fact, the project participant in the monitoring plan, has stated that project equipment and installed capacity will be inventoried every year in order to have a real estimation of project equipment consumption. In the investment comparison analysis, only those equipments which are clearly determined in the moment of validation have been included. Hence, project equipment consumption has been under estimated. In the project situation, there will be more equipment and, so, project consumption will be higher. Thus, project savings from electricity will be lower in the "actual" situation. Hence, financial additionality of the project will not result negatively affected due to new project equipment installed. This information and the explanation of the investment analysis have been included in the PDD.	highest peak and non-peak tariffs (0.77478 R$/kWh and 0.12395 R$/kWh respectively) of this period have been taken for the financial analysis and were moreover adjusted by the average increase over that period for the whole crediting period. Peak tariff is applicable during 3 hours of the day and non peak tariff during 21 hours per day (IRL 112). **þ** 3. The Power Purchase Agreement (PPA), submitted to the validation team (IRL 10), mentions a tariff of R$ 128.10 for each MWh dispatched to the grid. Every 12 months, the tariff is adjusted by inflation according to the PPA. The investment comparison adopts a yearly increase of 3.5%. This increase is based on an estimate for 2010

		6. The increase of capacity required for an increase in the wastewater inflow is estimated in the baseline situation according to retention times in each treatment, maintaining the retention times in the anaerobic and facultative treatments. The retention time in ulterior treatments (as polishing lagoons) does not affect the treatment efficiency. A deep explanation has been submitted to the validation team. 7. The equipment considered in the investment barrier analysis corresponds to the equipment in stage 2 of implementation of the project activity. In the PE calculations in the PDD, there have been considered both stages: - Stage 1. Project equipment installed capacity & distribution losses = 125.3175kW; - Stage 2. Project equipment installed capacity & distribution losses = 137.445kW. In both cases, the installed capacity considered in the PDD, in project emissions calculation and in CER Data Sheet are the same. In the case of the investment barrier, the second stage of implementation has been considered because it is the longest in time and stage 1 is considered a kind of intermediate stage in the way of arriving the final configuration. **Prevailing practice barrier:** Stabilization lagoons are defined as "***ponds in which wastes are allowed to decompose over long periods of time and aeration is provided only by wind action. Sunlight is allowed to fall on sewage to purify it*".** The reference to this definition is given by the European Environmental Agency, in the following link	according to an information given by the Brazilian Central Bank (IRL 109). **Þ** 4. A cross-check document for the budget of lagoons excavation (issued by JAMAR, IRL 64) has been submitted to the validation team. As the execution budget from P. COLPO is slightly higher than that from JAMAR and the first one is used for the investment comparison analysis, namely 6.5 R$/m3, it can be considered as conservative approach for the evaluation of investment costs in the baseline. **Þ** 5. The assumptions have been clearly described by the PPs in the protocol as well as PDD. All the assumptions are based on a conservative approach and are accepted by the valida-

		http://glossary.eea.europa.eu/terminology/concept_html?term=stabilisation%20lagoon and has been included in the PDD. Another definition of stabilization lagoon has been submitted to the validation team, taken from the XXII National Manufacturing Engineering Meeting, Curitiba, Paraná (XXII Encontro Nacional de Enegenharia de Produçao, Curitiba, Paraná, 2002) (http://www.biblioteca.sebrae.com.br/bds/BDS.nsf/38F13D0429D60A5B832574250051CFB9/$File/O%20esgoto%20-%20a%20import%C3%A2ncia%20do%20tratamento%20e%20as%20op%C3%A7%C3%B5es%20tecnol%C3%B3gicas.pdf). According to the definition in the reference above, *"the stabilization lagoons can be classified as anaerobic, facultative and maturation lagoons. (As lagoas de stabilizaçao podem ser classificadas como: lagoa anaerobia, facultative e maturaçao)".* A clarification is found regarding types of stabilization lagoons in the monography "Analyses of alternatives for minimizing the impacts of effluents from slaughterhouses": "There are four basic types of stabilization lagoons: aerobic, generally flat with around 0.50m depth; anaerobic with 2 -4.5 m depth, facultative, with 1.5m depth and maturation, with 1 m depth and after the secondary system to increase effluent quality" *As lagoas de estabilização apresentam quatro tipos básicos: aeróbias, em geral rasas, com cerca de 0,50m de profundidade; anaeróbias entre 2m e 4,5m de profundidade; facultativas, om profundidade entre 1,5m a 2m; e as de maturação, com 1m de profundidade, usadas após sistemas secundários, para melhorar o efluente (ITACRETO, 2007).* http://www.qualittas.com.br/documentos/Levantamento%20das%20Alternativas%20de%20Minimizacao%20dos%20Impactos%20-	tion team. Þ 6. It has been explained in a traceable way (IRL 48) why in the case of an increasing wastewater flow an additional total volume of 204,313 m3 in anaerobic, facultative and polishing lagoons is necessary in order to maintain the same retention time in anaerobic and facultative lagoons (the retention time in polishing lagoons can be reduced without affecting the treatment system) as before. Þ 7. Explanation is traceable and is accepted by the validation team. Þ Regarding prevailing practice barrier: -Stabilization lagoons have been explained in the PDD and respective evidences have been submitted to the validation team (IRL 71,72,75,90). Þ

		%20Tania%20Luisa%20Maldaner.PDF As per the definitions above, stabilization lagoons are those lagoons used in wastewater treatment in which there is no artificial supply of air or oxygen. Depending mainly on the depth, water in the lagoon can be under anaerobic or under aerobic condition. According to the National Methane Inventory for Waste Management in Brazil, "*the industrial effluents from different sectors, as food, beverages, chemistry, metal, textile, leather and paper, have been traditionally treated through lagoons or activated sludge systems or biological filters. In the earlier 80's, some anaerobic filters units existed and in the last years, there has been a strong increase in the use of anaerobic reactors for industrial effluent treatment. Sectors using this technology benefit from the operation of these systems, as the low space requirements and the absence of aeration energy*". http://homologa.ambiente.sp.gov.br/proclima/publicacoes/publicacoes_portugues/inventario_de_residuos_brasil.pdf According to the XXII National Manufacturing Engineering Meeting, Curitiba, Paraná (XXII Encontro Nacional de Enegenharia de Produçao, Curitiba, Paraná, 2002, "there is not a pattern treatment to be used in wastewater treatment. Several factors affect the selection between different technological options, as space availability, adequate weather, characteristics of wastewater and effluent requirements (…). In Brazil, specially in the Northeast due to the space availability and the sunny weather during the whole year, it is recommended to	-Some more evidences (amongst others IRL 66, 76, 86, 87, 88 and 92.) have been provided to the validation team showing that open anaerobic lagoon systems are the prevailing practice in slaughterhouses/swine farms. Even though prevailing practice barrier can not be considered as decisive barrier, so at least it substantiates the investment barrier. **þ** Other barriers have been taken out from the PDD, as no additional evidence could be provided. **þ** CAR is closed. **þ**

		choose biologically active systems, as oxidation systems or stabilization lagoons. http://www.biblioteca.sebrae.com.br/bds/BDS.nsf/38F13D0429D60A5B832574250051CFB9/$File/O%20esgoto%20-%20a%20import%C3%A2ncia%20do%20tratamento%20e%20as%20op%C3%A7%C3%B5es%20tecnol%C3%B3gicas.pdf, pag 6. The Environmental Technology Company (Companhia de Tecnologia de Saneamento Ambental) (CETESB)) develops reports focused on different sectors. In 2008, CETESB published the "**technical and environmental guidance on processing materials in slaughterhouses (bovine and swine)"** (Graxarias Processamento de Materiais de Abatedouros e Frigorificos Bovinos e Suínos). Wastewater treatments and characteristics and effluent requirements are similar in any animal industry with high organic concentration, as poultry industry. In this report, the CETESB states the following: http://www.cetesb.sp.gov.br/Tecnologia/producao_limpa/documentos/graxaria.pdf, Page 45, 3.4.3. Wastewater effluent treatment in Graxarias : This treatment may vary between companies, **but a typical treatment in the sector has the following characteristics:** 1. primary treatment: for gross solid removal, mainly through physical forces. 2. Equalization /homogenization: to minimizing the settling of suspended solids through mixing processes; 3. Secondary treatment: for colloids removal	

		through biological activation (…). In this stage, stabilization lagoons are distinguished, especially anaerobic lagoons (...). Tratamento dos Efluentes Líquidos de Graxarias Este tratamento pode variar de empresa para empresa, mas um sistema de tratamento típico do setor possui as seguintes etapas: • Tratamento primário: para remoção de sólidos grosseiros, suspensos sedimentáveis e flotáveis, principalmente por ação físico-mecânica; • Equalização: (...) para minimizar a sedimentação de eventuais sólidos em suspensão, por meio de dispositivos de mistura; • Tratamento secundário: para remoção de sólidos coloidais, dissolvidos e emulsionados, principalmente por ação biológica, (...). Nesta etapa, há ênfase nas lagoas de estabilização, especialmente as anaeróbias. (...) The First Brazilian Inventory of Anthropogenic GHG Emissions, from 2002, mentions the following: From 1983, more than 350 anaerobic systems have been installed (for industrial effluent treatment) (page 26) According to the paper "The potential reuse of water (treated effluents) in slaughterhouses", (O Potencial de Reuso de Água (Efluentes Tratados) em um Matadouro-Frigorífico), pages 83 & 85. http://www.eesc.usp.br/sea/sea2004/arquivos/Anais_-_SEA-2004.pdf, The slaughterhouses generate effluents with high organic loads. Due to this characteristic, these effluents are in their majority, treated by biological processes as	

		stabilization lagoons, anaerobic systems or activated sludge, according to the size, production capacity and/or the existence of industrial units. *Os abatedouros frigoríficos possuem efluentes de natureza essencialmente orgânica, mesmo quando contam com unidades de industrialização de carne e subprodutos. Por esta característica estes efluentes são na grande maioria dos casos tratados por processos biológicos como lagoas de estabilização, reatores anaeróbios ou sistemas de lodos ativados, de acordo com seu porte, capacidade de abate ou da existência de unidades de industrialização da carne.* In page 85 of the mentioned document, a typical wastewater treatment system in a slaughterhouse is shown. It consists on anaerobic, facultative and polishing lagoons. The references listed above have been included in the PDD and submitted to the validation team. As stated by these new and previous references, the use of stabilization lagoons, as understood from the above definitions, is the most suitable and recommended for industrial effluents from slaughterhouses. Other barriers have been taken out from the PDD.	
<u>Corrective Action Request No.15.</u> The text above should be revised as some change in the existing wastewater treatment would be necessary in the absence of the proposed project activity due to the increase of wastewater flow.	B.5.20.	The text has been modified as follows: "In the absence of the CDM additional revenues, the project owner would have no motivation from the financial point of view to risk their own funds, to digress from their business and to face such a project, completely new for Cooperativa Lar, nor to change the existing	Text was revised, bearing in mind the increase in wastewater flow. CAR is closed. **þ**

		wastewater treatment **concept** at their unit for chicken. As explained in section B.4, in the absence of the project activity, the project proponent would have decided to construct (excavate) other open anaerobic and facultative lagoons with the only aim of maintain an enough retention time to ensure that COD, SS and BOD5 removal were proper and according the Brazilian regulation. Those new lagoons will allow the project proponent to increase the volume available for anaerobic treatment in open lagoons, thus ensuring a minimum retention time in them."	
Corrective Action Request No.16. Procedures provided in the methodologies AMS III.H, AMS III.I and AMS I.D to calculate project emissions should be clearly indicated in B.6.1. of the PDD.	B.6.1.1.	In section B.6.1, procedures provided to calculate project emissions have been included. Also, procedures for calculating baseline COD loads have been indicated in the PDD and COD values are included in the CER calculation Sheet.	Procedures provided in the applied methodologies to calculate project emissions are clearly indicated in B.6.1. of the PDD now. CAR is closed. **þ**
Corrective Action Request No.17. 1. The selection of options should be justified both for baseline and project emissions. It should be clearly explained in B.6.1. why certain baseline and/or project emissions are applicable to the proposed project activity and others not applicable to the proposed project activity. 2. It is not the Simple Adjusted Operating Margin which is used for the calculation of the emissions factor (operating margin) but the Dispatch Data Analysis. Please correct. 3. The emissions factor will be applied ex-post and not ex-ante as described in B.6.1. of	B.6.1.2.	1. In section B.6.1 it has been explained, one by one, why certain baseline and project emissions are not applicable to the proposed project activity. 2. This has been corrected in the PDD. 3. The emission factor will be applied ex post. This has been corrected in the PDD. Answer 2: The emission factor available at the commencement of the validation has been applied in the calculations. Modifications have been done in the PDD and the calculation sheet. 3rd answer: Both parameters have been mentioned only in B.7.1. and deleted from B.6.2.	1. The selection of options has been justified both for baseline and project emissions in the revised PDD. **þ** 2. PDD has been corrected and mentions now the Dispatch Data Analysis. **þ** 3. The PDD clearly states now that the emissions factor will be applied ex-post, however the value available at commencement of validation should be applied. **2nd answer:**

the PDD. Please correct.		The values available at the moment of the commencement of validation (Webhosting of PDD for GSP on 15/05/2009) are the following, which have been indicated in the PDD. EF_{OM} = 0.2909 tCO_2/MWh; EF_{BM} = 0.0775 tCO_2/MWh; EF_{CM} = 0.1842 tCO_2/MWh; The new emission factor was officially published by the Ministry of Science and Technology on 19/05/2009, after the commencement of the validation process. The ER Calculation sheet and the corresponding data in the PDD have also been modified accordingly and submitted to the validation team.	The parameters EF(CM), EF(OM) and EF(BM) should be mentioned only in B.7.1. and be taken out from B.6.2. as the same are monitored parameters and the correct values should be indicated (the ones available at commencement of validation). **3rd answer:** The parameters EF(CM), EF(OM) and EF(BM) are only mentioned in B.7.1. now and have been taken out from B.6.2.. The correct values available at commencement of validation are indicated now. The grid emission factor was calculated by the Brazilian DNA (available at: http://www.mct.gov.br/index.php/content/view/307492.html), using the Dispatch Data Analysis for the Operating Margin. The Build Margin emission factor was determined using the generation-weighted average emission factor of all power units during the most recent year for which power generation data was available. Therefore, the emission factor of 0.1842

			tCO2/MWh was accepted just for estimating the expected emission reductions of the project activity during the crediting period. Hence, the emission factor calculation used in this PDD, for estimating purposes only, must be verified and updated accordingly using the most recent data available at the time of the verification process. CAR is closed. **þ**
Corrective Action Request No.18. The formula for baseline emissions from electricity/fuel consumption should be included in chapter B.6.1.	B.6.1.3.1.	The formula for baseline emissions from electricity consumption as per AMS.I.D has been included in section B.6.1 of the PDD.	The requested formula has been included in B.6.1. of the PDD. CAR is closed. **þ**
Corrective Action Request No.19. The formulae required for the determination of emission reductions should be indicated in B.6.1. of the PDD.	B.6.1.8.	Formulae required for the determination of emission reductions have been indicated in section B.6.1 of the PDD. **Answer 2:** The formula for the determination of emissions reduction has been included in section B.6.1 of the PDD $ER_y = BE_y - PE_y - LE_y$	Requested formula for the determination of emission reductions has not been included in B.6.1. of the PDD yet. **2nd answer:** Requested formula for the determination of emission reductions has been included in B.6.1. of the PDD. CAR is closed. **þ**
Corrective Action Request No.20. The following parameters including its specifications should be included into B.6.2. of the	B.6.2.1.	1. COD removed by baseline treatment system i in year y, has been included in section B.6.2 2. COD removal efficiency has been included in section	1. Parameter has been included. **þ** 2. Parameter has been

PDD: 1. $COD_{removed, i, y}$ COD removed by baseline treatment system i in year y 2. COD removal efficiency (according to §20, AMS III.H, the removal efficiency of the baseline systems should be measured ex ante using historical records of COD removal efficiency of at least one year prior to the project implementation or through representative measurement campaign.) 3. UF_{BL} Model correction factor to account for model uncertainties 4. Volume of treated wastewater discharged in baseline situation in year y (m^3) 5. $COD_{ww, discharge, BL, y}$ COD of the treated wastewater discharged into sea, river or lake in the baseline situation in the year y (tonnes/m^3) 6. UF_{PJ} Model correction factor to account for model uncertainties in project situation 7. $MCF_{ww, treatment, PJ, k}$ Methane correction factor for project wastewater treatment system k (MCF values as per table III.H.1) 8. $MCF_{ww, PJ, discharge}$ Methane correction factor based on discharge pathway in the project situation (e.g. into sea, river or lake) of the wastewater (fraction) (MCF values as per table III.H.1) 9. Methane correction factor for the aerobic wastewater treatment system k (MCF vale for well managed aerobic biological systems, or for poorly managed or overloaded systems		B.6.2 of the PDD. 3. UF bl has been included in section B.6.2 of the PDD 4. It has been indicated in section B.6.2 of the PDD that volume of treated wastewater discharged is equal to volume of wastewater treated in the baseline scenario. 5. COD of the treated wastewater discharged in the baseline situation in the year y has been included in section B.6.2 of the PDD. 6. UF pj has been included in section B.6.2 of the PDD 7. Methane correction factor for project wastewater treatment system k (MCF values as per table III.H.1) has been included in section B.6.2 8. Methane correction factor based on discharge pathway in the project situation (e.g. into sea, river or lake) of the wastewater (fraction) (MCF values as per table III.H.1) has been included in section B.6.2 of the PDD 9. Methane correction factor for the aerobic wastewater treatment system k (MCF vale for well managed aerobic biological systems, or for poorly managed or overloaded systems has been taken as per table III.I.1. **Answer 2:** Methane correction factor for project wastewater treatment system k (MCF values as per table III.H.1) has been included in section B.6.1 of the PDD.	included. **þ** 3. Parameter has been included. **þ** 4. B.6.2. of the PDD indicates that volume of treated wastewater discharged is equal to volume of wastewater treated in the baseline scenario. **þ** 5. Parameter has been included. **þ** 6. Parameter has been included. **þ** 7. This parameter has not been included yet. 8. Parameter has been included. **þ** 9. Parameter has been included. **þ** **2nd answer:** The validation team confirms that the parameter $MCF_{ww, treatment, PJ, k}$ has been included in B.6.2. of the PDD including its specifications. CAR is closed. **þ**

as per table III.I.1 shall be taken.			
Corrective Action Request No.21. The parameter "Volume of wastewater treated in baseline wastewater treatment system i in year y (m^3)" refers to the wastewater treated in the baseline system. Title, description, choice of data/measurement method and value should be revised.	B.6.2.2.1.	This parameter has been revised and corrected in the PDD.	Parameter has been revised. CAR is closed. **þ**
Corrective Action Request No.22. The inflow COD should refer to the baseline system, thus title, description, value, choice of data/measurement method should be revised. Regarding the value, historical records of at least one year prior to the project implementation shall be used (see §17 AMS III.H and §5 AMS III.I). The COD samples of wastewater taken at different point of the wastewater treatment system (IRL 32) which were presented during the on-site visit, can be used for this purpose.	B.6.2.2.3.	This parameter has been corrected in the PDD. A description of data choice has been included in section B.6.1 and in the description of this parameter. As shown during the site visit, historical record of COD measurements at different points of the baseline treatment, were used. These records, which were periodically cross-checked by a third party laboratory, were taken between January 2007 to November 2008, hence 23 months of historical data have been used to estimate baseline COD. This and the average process, have been explained in section B.6.1.	Parameter has been revised. CAR is closed. **þ**
Corrective Action Request No.23. The outflow COD should refer to the baseline system, thus title, description, value, choice of data/measurement method should be revised. Regarding the value, historical records of at least one year prior to the project implementation shall be used (see §17 AMS III.H and §5 AMS III.I). The COD samples of wastewater taken at different point of the wastewater treatment system (IRL 32) which were presented during the on-site visit, can	B.6.2.2.4.	This parameter has been revised and corrected in the PDD. Historical records from January 2007 to November 2008 have been considered. These data have been included in the PDD, in the calculation sheet and average has been considered for baseline calculation. These data, taken by Cooperativa Lar's personnel, were cross-checked by a third party laboratory. This has been explained in the PDD in section B.6.1, "Determination of baseline COD values".	Parameter has been revised. CAR is closed. **þ**

be used for this purpose.			
Corrective Action Request No.24. Regarding the parameter "$MCF_{ww,\ treatment,\ BL,\ i}$ Methane correction factor for baseline wastewater treatment system i": It should be clearly indicated which value has been finally applied for the estimation of baseline emissions. The choice of data has to be justified.	B.6.2.2.9.	The value applied for this parameter is 0.8 as it has been indicated in section B.6.2 of the PDD. This is based on table AMS.III.H.1. In the baseline situation, the wastewater would have been treated in anaerobic lagoons with depth over 2m. According to the applicable methodology, $MCF_{ww,treatment,BL,I}$ is equal to 0.8. **Answer 2:** Two values are considered for $MCF_{ww,treatment,BL,I}$; 0.8 when the baseline treatment is an anaerobic open lagoon with depth over 2m; 0.3 when the baseline treatment is an aerobic lagoon poorly managed; These values have been chosen according to the applicable methodologies AMS.III.H and AMS.III.I, from the IPCC 2006 values for MCF, presented in tables AMS.III.H.1 and AMS.III.I.1. This has been included in the PDD in section B.6.2.	The choice of data has still to be justified. **2nd answer:** Choice of data of the parameter "Methane correction factor for baseline wastewater treatment system i" is clear now. CAR is closed. **þ**
Corrective Action Request No.25. Regarding the parameter "Global Warming Potential for methane": the source should be corrected and refer to the IPCC 2006 guidelines.	B.6.2.2.12.	This source has been corrected in the PDD. The source is IPCC 2006 Guidelines.	Requested change has been provided in the PDD. CAR is closed. **þ**
Corrective Action Request No.26. The parameter F (Fraction of CH4 in biogas) should be taken out from B.6.2. of the PDD, as not applicable.	B.6.2.2.17.	This parameter has been taken out from section B.6.2 in version 02 of the PDD.	Parameter F has been taken out from B.6.2. CAR is closed. **þ**
Corrective Action Request No.27.	B.6.2.2.22.	Two tables are indicated in the PDD for this parameter.	Regarding the parameter:

Regarding the parameter "$MCF_{ww, BL, discharge}$ Methane correction factor based on discharge pathway in the baseline situation (e.g. into sea, river or lake) of the wastewater (fraction): It should be clearly mentioned which value is used for which case (which methodology).		For systems affected by AMS.III.H, the value applied for $MCF_{ww,treatment,BL,I}$ is 0.8 in accordance with the applicable methodology AMS.III.H, as it has been indicated in version 2 of the PDD. In the baseline situation, wastewater from the second anaerobic existing lagoon, would discharge in the third existing anaerobic lagoon, which depth is over 2m and, according to table III.H.1, MCF is equal to 0.8. In stage 1, the systems affected by AMS.III.I, discharge in the baseline situation on the existing aerobic lagoon, which is poorly managed. In accordance with table III.I.1, the value to be applied is 0.3. In stage 2, the systems affected by AMS.III.I, discharge in the baseline situation on the existing second facultative lagoon, which depth is over 2m. In accordance with table III.I.1, the value to be applied is 0.8. This has been indicated in the PDD.	"Methane correction factor based on discharge pathway in the baseline situation": It is clear now which value is used for which case. CAR is closed. **þ**
Corrective Action Request No.28. Regarding the parameter "CFE_{ww} Captured efficiency of the biogas recovery equipment in the wastewater treatment systems": The description should be revised (please refer the parameter CFEww only to capture efficiency and not to flaring efficiency, as the latter one is a separate parameter. Please revise the title as per the methodology.	B.6.2.2.30.	The description has been corrected in the PDD.	Correction has been provided. CAR is closed. **þ**

Corrective Action Request No.29. Regarding the parameter "FE Flare efficiency": In the case the default value for the flare/combustion efficiency is applied (90%), the parameter has to be included into B.6.2., otherwise in B.7.1. The combustion efficiency of the generators should be evidenced.	B.6.2.2.32.	As explained in version 02 of the PDD, the project proponent has decided to relinquish the emission reductions from the biogas flaring in the open flare. Although this flare will be installed due to safety reasons, the project proponent will not apply for the emission reductions involved in the combustion of biogas in the flare. Hence, this parameter will not be monitored and, thus, it has been removed in version 02 of the PDD. Combustion efficiency of the generators is 99.9% as per the manufacturer specifications. These specifications have been submitted to the validator. **Answer 2:** According to the Response from the SSC WG to the clarification SSC_324 concerning AMS-III.H. ver. 12, "*if the biogas is combusted for a gainful use of the released energy as in an engine or a power plant, a destruction efficiency of 100% can be used for the portion of biogas that is combusted when applying AMS-III.H, i.e. use a value of 100% for FE in equation 16 in paragraph 32 for the portion of biogas that is combusted for a gainful use*". The PP has considered this flaring efficiency for the biogas combusted in the biogas engines and considers that this parameter should not be included in section B.7.1. of the PDD to be monitored. The response from the SSC WG has been submitted to the validator and can be found in the following link: http://cdm.unfccc.int/UserManagement/FileStorage/VNWAGY8MS92ZXDKUHEF5LB07QICT1P	Flare efficiency has not necessarily to be indicated anymore, as no CERs are claimed for flaring. Regarding the combustion efficiency of the generators, the same has not been evidenced yet. PPs are requested to submit a respective evidence. Besides, it should be clarified whether a default value will be applied or the combustion efficiency will be monitored. . **2nd answer:** The validation team agrees with the PPs that a combustion efficiency of 100% can be used according to the response from the SSC WG to the clarification SSC_324. No monitoring is necessary. CAR is closed. **þ**
Corrective Action Request No.30. It should be clearly indicated which	B.6.2.2.41.	It has been indicated in section B.6.2 of the PDD the following:	MCFanaerobic,i values have been correctly indicated.

MCFanaerobic,i value is finally applied.		Values applied depend on the system replaced: □ Anaerobic deep lagoon (depth>2 meters): 0.8; □ Aerobic treatment poorly managed or over-loaded: 0.3;	CAR is closed. **þ**
Corrective Action Request No.31. 1. Please make clear in the PDD that regarding AMS III.H. ex-post emission reductions are based on the lower value of (i) The amount of biogas recovered and fuelled or flared (MDy), during the crediting period, that is monitored ex post (ii) Ex post calculated baseline, project and leakage emissions based on actual monitored data for the project activity. 2. Please mention in the PDD that emission reductions from electricity generation are based on the electricity generated multiplied with the grid emissions factor and that project emissions from electricity consumption for project equipment are considered respectively.	B.6.3.1.	This has been indicated in version 02 of the PDD. As indicated in the PDD, the project proponent has relinquished to apply for emission reductions generated from biogas flared in the open flare. Only emission reductions from biogas used for electricity generation will be accounted. In this sense, a mass flow-meter will be installed in the entrance to biogas engines and electricity generated will be measured by means of electricity meters installed for each biogas engine. This, although it has been calculated in the PDD, will be monitored ex post in every verification period. In the PDD and for calculation purposes, it has been considered that 100% of the biogas recovered will be combusted in the engines and generate electricity. **Answer 2:** It has been stated that the PP will not apply for the ER resulting from the biogas recovered and flared in the safety torch during the crediting period. As explained, only the amount of biogas destroyed in the engines with a gainful use will be considered in the ER calculation. Hence, the emission reduction calculation will be, in any case, calculated ex-post based in the monitored data of the project activity. This has been indicated in the project activity.	It has not been indicated in the PDD yet, that regarding AMS.III.H. ex-post emission reductions are based on the lower value of (i) The amount of biogas recovered and fuelled or flared (MDy), during the crediting period, that is monitored ex post (ii) Ex post calculated baseline, project and leakage emissions based on actual monitored data for the project activity. PPs are requested to add. 2. It is clear according to the PDD now that emission reductions from electricity generation are based on the electricity generated multiplied with the grid emissions factor and that project emissions from electricity consumption for project equipment are considered respectively. **þ**

		3rd answer: The following has been included in section B.6.3 of the PDD: Considerations as per the applicable methodologies 1. AMS.III.H. According to paragraph 20 of AMS.III.H, "if the baseline treatment system is different from the treatment system in the project scenario, the monitored values of the COD inflow during crediting period will be used to calculate the baseline emissions ex post. The outflow COD of the baseline system will be estimated using the removal efficiency of the baseline treatment systems. The removal efficiency of the baseline systems will be measured ex ante through representative measurement campaign, or using historical records of COD removal efficiency of at least one year prior to the project implementation as per paragraph 17 or 18". According to paragraph 30 of the SSC methodology, "Ex post emission reductions shall be based on the lowest value of the following: (i) The amount of biogas recovered and fuelled or flared (MDy) during the crediting period, that is monitored ex post; (ii) Ex post calculated baseline, project and leakage emissions based on actual monitored data for the project activity." As it has been explained, the PP will not apply for ER	**2nd answer:** The logic behind the answer given by the PPs is not retraceable to the validation team. Even though flaring will not be considered in the CER calculation, ex-post emission reductions according to AMS.III.H. are based on the lower value of (i) The amount of biogas recovered and fuelled or flared (MDy), during the crediting period, that is monitored ex post (ii) Ex post calculated baseline, project and leakage emissions based on actual monitored data for the project activity. PPs are requested to follow this approach and to add respective information in the PDD. **3rd answer:** Requested information has been provided in B.6.3. of the PDD. According to AMS III.H. "*Ex post emission reductions shall be based on the lowest value of the following*: (i) *The amount of biogas re-*

		from the flaring of biogas in the safety torch, assuming that no biogas is flared. Hence, the paragraph above will refer only to biogas recovered and fuelled in biogas engines during the crediting period. 2. AMS.III.I. "To determine CODremoved,i,m,y: as the baseline treatment system(s) is different from the treatment system(s) in the project scenario, the monitored values of the COD inflow during crediting period will be used to calculate the baseline emissions ex post".	*covered and fuelled or flared (MD_y) during the crediting period, that is monitored ex post;* *(ii) Ex post calculated baseline, project and leakage emissions based on actual monitored data for the project activity."* CAR is closed. **þ**
Corrective Action Request No.32. The GHG calculations tool (excel file) should be submitted in English language in a complete and transparent manner to the validation team.	B.6.3.2.	The GHG calculation sheet has been cleared, translated and sent to the validator. The calculation sheet shows the calculation in a yearly basis for the second stage of implementation and the calculation for each period in this second stage, considering the water inflow increase, starting from 01/10/2010, which has been considered the starting date of the crediting period, the second year and next years (from 01/01 to 31/12 each year) and the last period, from 01/01/2020 to 30/09/2020.	The CER excel calculation tool has been submitted in English language to the validation team and has been verified by the team for correctness of the data and for consistency with other documents like PDD. CAR is closed. **þ**
Corrective Action Request No.33. A separate table for each of the components (AMS III.H, AMS III.I and AMS I.D) should be provided in B.6.4.	B.6.4.3.	A separate table for each component/methodology has been done. It has been provided in section B.6.4 and included in the CER calculation sheet.	Separate tables for each of the components (AMS III.H, AMS III.I and AMS I.D) are provided in B.6.4. now. CAR is closed. **þ**
Corrective Action Request No.34. The following parameters including its speci-	B.7.1.1.	1. The parameter COD removed by project treatment system k in year y has been included in section B.7.1	1. Parameter has been included. **þ**

fications should be included into B.7.1. of the PDD: 1. $COD_{ww, removed, PJ, k, y}$ COD removed by project treatment system k in year y (tonne/m^3) 2. End use of final sludge generated (§39 AMS III.H.and §23 AMS III.I). 3. EF(CM) Emissions factor (combined margin) 4. MD_y Methane captured and destroyed/ gainfully used by the project activity in year y (tCO2e) including the indication of the formula how MDy is calculated. 5. D_{CH4} Density of methane at the temperature and pressure of the biogas in year y (tonnes/m^3) 6. Other flare operation parameters (in the case a default value for the flare efficiency is used) 7. ECy,grid Net electricity supplied to the grid		as calculated from COD inflow and COD outflow. 2. There is no sludge generation in the proposed project activity as it has been indicated in version 02 of the PDD. Hence, no end use of sludge has to be monitored. **Answer 2:** Please, refer to our response to CAR 8 3. The EF, OM and BM have been included in section B.7.1. of the PDD. 4, 5, 6. As project proponent has decided to relinquish to emission reductions from flaring biogas in the open flare, the tool to determine project emissions from flaring gases containing methane is not applicable, nor the parameters regarding the flare operation. **Answer 2:** The PP is only claiming for the ER resulting from the destruction of methane in the biogas engines. The recovered biogas will be sent to the flaring system or to the engines for electricity generation. The PP, since is not accounting the ER resulting from biogas flared in the torch, has considered in a conservative approach, that no biogas is destroyed in the flare. Hence, the biogas not combusted for power generation is assumed to be released to the atmosphere, not destroyed, although it will actually be combusted in the flare. **3rd answer:** **2.** The sentence, which can be confusing, has been	2. As some of the sludge will be used as feedstock, the end use of final sludge has to be monitored. 3. Parameter has been included. **þ** 4. Even though no CERs are claimed for methane flared, at least biogas flow to the flare and flare temperature should be continuously monitored as it has to be ensured that methane will be really destroyed. The respective parameters have to be included into B.7.1. of the PDD. 5. It is not clear why density of methane has not been included in B.7.1. of the PDD, once the parameter is necessary for the calculation of methane destroyed. PPs are requested to include the parameter. 7. 6. PPs should clarify why parameter was

		replaced as follows: "Solid wastes separated by flotation in the PC flotation tank will be dried and treated to be used as animal feedstock. At the end of the wastewater treatment, resulting sludge will be redirected to the homogenization tank to maintain the required level of bacteria in the wastewater treatment". 5. Methane density has not been included in the monitoring parameters because biogas flowmeter will measure directly in normalized cubic meters. Hence, density is not necessary to calculate the amount of methane destroyed. **4th Answer:** The density of methane at standard conditions according to ACM 0001 has been included in section B.6.2 of the PDD as a default value.	not included into the PDD. Parameter has been included. **þ** **2nd answer:** 2. The PDD mentions in various parts, that "the solid sludge generated in the process is treated to be used as animal feedstock". Thus, the end use of the sludge should be monitored to ensure that no anaerobic decay of the sludge takes place. AMS III.H. mentions in paragraph 39 "if the methane emissions from anaerobic decay of the final sludge were to be neglected because the sludge is controlled combusted, disposed in a landfill with methane recovery, or used for soil application, then the end-use of the final sludge will be monitored during the crediting period." 4. The answer given by the PPs is retraceable and is finally accepted by the validation team. **þ** 5. Item 5 has not been responded by the PPs thus is

			repeated once more: It is not clear why density of methane has not been included in B.7.1. of the PDD, once the parameter is necessary for the calculation of methane destroyed. PPs are requested to include the parameter. 6. Not applicable anymore, as flaring does not make part of the project boundary and no CERs from flaring are claimed. **þ** **3rd answer:** 2. It has been clarified now in A.2. and A.4.2. of the PDD that solid wastes separated by flotation in the PC flotation tank will be dried and treated to be used as animal feedstock. Besides, at the end of the wastewater treatment, resulting sludge will be redirected to the homogenization tank to maintain the required level of bacteria in the wastewater treatment. Thus, sludge is reused in the process and actually no end-use of sludge

			takes place, thus no monitoring is necessary. **þ** 5. It is not clear how methane destroyed (in tones) could be calculated without the parameter "density of methane". The same is necessary in order to transform Nm3 into tones. In the case biogas flow is measured in Nm3, the parameter "density of methane" should be included in B.6.2. as default value at standard conditions (0.0007168 t/Nm3). **4th answer:** 5. The validation team confirms that the parameter "density of methane" at standard conditions has been included in section B.6.2 of the PDD as a default value. CAR is closed. **þ**
Corrective Action Request No.35. Regarding the parameter "Volume of wastewater treated in project situation": Please indicate that the wastewater outflow will be the same as inflow. Title, data unit, description, measurement method should be revised; a reference to standards and accuracy should be indicated. QA/QC procedures should be revised (will there be any calibra-	B.7.1.2.1.	It has been indicated that water inflow and water outflow are the same. Title, data unit, description and measurement method have been revised. Regarding the calibration of the parshall flume, it has been indicated in the PDD the following: *The Parshall throat itself cannot be calibrated since it is a narrowing of the water channel. When electronic measurement devices will be installed in the Parshall*	All requested information has been provided, however the accuracy of the Parshall flume meters should be still indicated. **2nd answer:** The technical specifications (IRL 95) submitted to the validation team indicate an

tion for the Parshall flume flow meter?). The parameter should be specified for both systems (anaerobic digester system and aerobic physical-chemical system).		*flume for measuring the water flow, these devices (sensor) will be calibrated as per manufacturer specifications.* **Answer 2:** Technical specifications of the Parshall flume have been submitted to the validator. An ultrasonic Parshall flume with accuracy of ± (0.2% of measured distance + 0.05% of range) will be installed. **3rd answer:** The accuracy of Parshall flume has been indicated in section B.7.1 of the PDD.	accuracy of ± (0.2% of measured distance + 0.05% of range), however the accuracy is not indicated in the PDD yet. Please mention the accuracy of the Parshall flume meters in the PDD. **3rd answer:** Accuracy of the Parshall flume meter has been indicated in B.7.1. CAR is closed. **þ**
Corrective Action Request No.36. Regarding the parameter $COD_{ww,untreated,y}$: Measurement method and QA/QC procedures should be revised.	B.7.1.2.6.	Measurement method is the Standard Method for the Examination of Water and Wastewater (American Public Health Association) and this method will be used for the analysis. The measurements will be taken twice a month and every three measurements, one will be cross checked by a third party laboratory. This has been modified in the PDD.	Requested parameter specifications have been revised. CAR is closed. **þ**
Corrective Action Request No.37. Regarding parameter $COD_{ww,treated,\ y}$: Please specify each of the systems. Title, data unit and description should be revised as well as measurement method and frequency of monitoring.	B.7.1.2.7.	The location of each measurement point has been indicated in the PDD in section B.7.2. In section B.7.1, title, data unit, description, measurement method and frequency of monitoring and cross checking have been revised.	Requested parameter specifications have been revised. CAR is closed. **þ**
Corrective Action Request No.38. Please make clear in the B.7.1. of the PDD why $COD_{ww,\ discharge,\ PJ,\ k,\ y}$ is equivalent to COD	B.7.1.2.9.	It has been indicated in the PDD that COD inflow, COD outflow and COD discharge could be equal in some cases. In section B.7.2 it has been indicated every	Requested clarifications have been provided in the PDD. CAR is closed. **þ**

(treated) as it was communicated during the on-site visit.		measurement point in each stage of implementation. The following clarifications have been included in the PDD: *"COD discharge is equal to COD outflow of the last treatment system included in the project boundary. i.e, COD outflow (new aerated lagoon) = COD discharge (as per AMS.III.I) in stage 1"*. Also, it has been clarified the following: *"COD untreated measured for one system is equal to COD treated of the immediately previous system when installed serial*"	
Corrective Action Request No.39. As no proper electricity meter for the electricity consumption is available, PPs decided to conservatively determine the electricity consumption of the project equipment by means of the total installed capacity of the equipment, i.e. assuming that all relevant electrical equipment operates at full rated capacity. 10% to account for distribution losses for 8760 hours per annum (according to §35 of AMS III.H) should be considered. Please revise the specifications of the parameter "Annual fossil fuel and/or electricity used to operate the facilities or power auxiliary equipment" respectively.	B.7.1.2.10.	This has been indicated in the PDD, in the description of the monitoring parameter "Energy Consumed by the project activity" and a 10% increase has been considered due to distribution losses.	Requested parameter specifications have been revised. CAR is closed. **þ**
Corrective Action Request No.40.	B.7.1.2.13.	Since project proponent has relinquished to apply for emission reductions due to flaring of biogas, this pa-	The validation team accepts the parameter "Volume of

Regarding the parameter "$BG_{burnt, y}$ Biogas flared/combusted in year (m3)": The title and description should be revised.		rameter has been removed from the PDD.	biogas recovered in year y", mentioned in B.7.1. of the PDD as the one which is equivalent to the parameter "Biogas combusted in year". CAR is closed. **þ**
Corrective Action Request No.41. Regarding the parameter $w_{CH4, ww}$ Methane fraction of biogas as monitored at the outlet of the wastewater treatment source facility(ies) (kg or m^3 CH_4/kg or m^3 of biogas): It should be made clear that $w_{CH4, ww}$ is equivalent to $fv_{CH4,h}$, the measurement method (dry or wet as basis? Continuous measurement or measurements with a 95% confidence interval?) should be revised, reference to standards, accuracy should be indicated. A comment should be included that the simplified approach is chosen, namely only methane content is monitored and the difference is considered to be nitrogen.	B.7.1.2.23.	The methane fraction of biogas will be measured in the project activity. It has been indicated that a continuous gas analyzer will be used for monitoring the methane fraction in biogas in dry basis. Although the applicable methodology allows PP to use a discontinuous gas analyzer, it requires to give data in a 95% confidence interval. Since in the methodology it is not clear the frequency of data monitoring to get this 95% confidence interval, the PP has decided to use a continuous gas analyzer. This analyzer will only monitor the methane content in biogas. A proposal for this analyzer has been submitted to the validator, however, the PP has not yet decided about the final analyzer to be installed.	It has been decided that a continuous gas analyser will be used for the measurement of methane fraction of biogas. The same is indicated in the PDD. Accuracy of the analyser is not known yet, as the same is not purchased yet; all other specifications are correctly indicated in the PDD. Methane content is measured on dry basis, the same as biogas flow. CAR is closed. **þ**
Corrective Action Request No.42. Regarding the parameter "T_{flare} Temperature in the exhaust gas of the flare": The QA/QC procedures should be revised (annual calibration is necessary according to the Tool to determine project emissions from flaring); in measurement methods it should be added that "a temperature above 500°C indicates that a significant amount of gases are still being burnt and that the flare is operating".	B.7.1.2.40.	As explained in version 02 of the PDD, the project proponent has decided to relinquish the emission reductions from the biogas flaring in the open flare. Although this flare will be installed due to safety reasons, the project proponent will not apply for the emission reductions involved in the combustion of biogas in the flare. Hence, this parameter will not be monitored and, thus, it has been removed in version 02 of the PDD. **Answer 2:** Please, refer to our response in CAR 29. Since com-	It is not clear to the validation team yet why the parameter "temperature in the exhaust gas of the flare" has not been included into the monitoring plan. Please clarify. **2nd answer:** The validation team accepts the decision of the PPs not to include flaring into the project

		busting efficiency in the engines is assumed to be 100%, it is not required to monitor the combustion of biogas in the engines.	boundary and thus neither the monitoring of the parameter "temperature in the exhaust gas of the flare". The validation team agrees with the PPs that the parameter "temperature in the exhaust gas (engines)" does not have to be included into the monitoring plan as a combustion efficiency of 100% can be used as per response from the SSC WG to the clarification SSC_324. CAR is closed. **þ**
Corrective Action Request No.43. The PDD should inform about the quality control program of the aerobic (physical chemical) treatment system, its monitoring and should explain some of the most important operational parameters (like minimum removal efficiency of COD, BOD, oils, suspended solids).	B.7.1.2.48.	In section A.4.2, the main operational characteristics and the minimum removal efficiency of COD, BOD, SS and others have been included for the PC Flotation Tank. The quality control programme will be based on the removal efficiency, which, as per the Environmental Control Plan, has to remove a minimum amount of organic loads. Monitoring will be based on wastewater sample analysis. Data regarding the minimum removal efficiency in the PC Flotation Tank are available in the "Environmental Control Plan" which was submitted to the validator during the site visit (page 21). **Answer 2:**	The removal efficiency of the most important operational parameters has been mentioned in A.4.2. of the PDD. However, chapter B.7. should according to paragraph 22 of AMS III.I. still mention the documentation of the well managed aerobic system in a quality control program, monitoring the conditions and procedures that ensure the aerobic condition of the PC Flotation Tank. **2nd answer:** -The answer given by the PPs should be incorporated

		Aerobic conditions in the PC Flotation tank are ensured due to the own nature of the equipment. It is a Dissolved Air Flotation tank, where pressure of injected air is adjusted to the removal efficiency indicated in the Environmental Control Plan (PCA). The retention time in the PC Flotation tank is less than one hour for a peak flow of 350m3/h Volume of tank = 157.4 m3 (PCA); Flow = 350 m3/h; Retention time = 157,4/350 = 0.44h = 26.4 min. No anaerobic degradation can occur in this short gap of time, with or without aeration. This already ensure that wastewater degradation in the PC Flotation tank will never be anaerobic since the hydrolysis, acid formation and methanization of wastewater requires a minimum retention time which is recommended to be between 2 and 5 days, but half an hour is not enough for this degradation to happen. Several references of recommendations and typical values for retention time in anaerobic lagoons have been submitted to the validation team. Apart from this, the removal efficiency will be measured periodically through the analysis of wastewater samples in the inlet and outlet water flow in the tank. PC Flotation tank is designed to operate under specific aeration conditions. If aeration does not work properly, aerobic metabolism of bacteria will not be efficient and removal will be deficient. Hence, COD values in the outlet flow will show inefficiencies in the aeration system, but never anaerobic conditions, which are not possible with hy-	into chapter 7 of the PDD. - Why here “open lagoons” are mentioned once it is talked about the PC flotation tank? Please clarify. **3rd answer:** -The answer given by the PPs has been incorporated into chapter 7 of the PDD. -Clarification regarding the 2nd item has been provided. CAR is closed. **þ**

		draulic retention times under several days in an open lagoon. **3rd answer**: The PC flotation tank is not a closed or covered lagoon, but an open tank where aeration is induced with micro bubble diffusers. What the PP means in the previous statement is that if retention time is under a limit of several days, there is no chance for wastewater to create anaerobic conditions in an open tank or lagoon. In biodigesters, where inside conditions can be modified and altered (temperature, pressure, etc), this retention time can be lowered by means of increasing the degradation rate of organic matter. But this is something that does not occur in open tanks/lagoons. The response in the Validation Protocol has been included in chapter 7 of the PDD.	
Corrective Action Request No.44. Regarding the parameter "EG_{BLy} Electricity generated by the renewable electricity": Accuracy and reference to standard of the metering instrument should be indicated. It should be further indicated that electricity data are hourly measured and monthly recorded as per methodology AMS I.D, version 15.	B.7.1.2.49.	The metering instrument for electricity measurement is not installed yet. However, minimum class I accuracy electricity meters will be installed for the monitoring of electricity.	It is indicated now that electricity meters of class I will be used and the meters will be calibrated according to manufacturer´s specifications. Measurements will be done hourly and records monthly. CAR is closed. **þ**
Corrective Action Request No.45. Please provide information that both Zero Emissions Technologies SA and Zeroemis-	B.8.1.5.	This information has been included in the PDD in section B.8.	Information has been provided in B.8. of the PDD. CAR is closed. **þ**

sions do Brasil are project participants.			
Corrective Action Request No.46. 1. Evidence for the lifetime of the flare as well as the physical- chemical treatment system equipment should be provided to the validation team. 2. The operational lifetime in chapter C of the PDD should be revised to 10 years.	C.1.1.	Operational lifetime of the project activity (limited by the operational lifetime of geomembranes) has been revised in the PDD and corrected to 10 years.	Operational lifetime has been corrected to 10 years according to the lifetime of the geomembranes. This deems to be reasonable to the validation team once flare and physical-chemical treatment system should have at least 10 years or more of operational lifetime according to the local and sectoral expertise of the validation team. CAR is closed. **þ**
Corrective Action Request No.47. The start of the crediting period has to be revised to a more realistic date. Hereby the time for the whole validation process should be considered as well as the time for getting the Letters of Approval and the necessary time period according to UNFCCC requirements between the date of submission for registration and start of the crediting period.	C.2.1.	The starting date of the crediting period has been modified to a more realistic date: 01/01/2010. **Answer 2:** The starting date of the crediting period has been revised and modified in the PDD. A new starting date has been stated. The final starting date considered as realistic for the crediting period is 01/10/2010.	The starting date of the crediting period of 01/01/2010 is not realistic yet. Assuming the project can be submitted to the DNA meeting in March 2010 and considering at least 4 months for the issuance of the LoA and the time period according to the UNFCCC requirements, 01/10/2010 might be realistic as start of the crediting period. **2nd answer:** The revised starting date of the crediting period deems to be realistic in the opinion of the validation team and was thus accepted.

			CAR is closed. þ
Corrective Action Request No.48. 1. Please choose the correct format dd/mm/yyyy in indicating the start of the crediting period. 2. As the fixed crediting period has been chosen, the same should be indicated in chapter C.2.2. (Fixed crediting period) of the PDD and not C.2.1. (Renewable crediting period).	C.2.2.	The format of the date of start of the crediting period has been modified with the correct format. It has been modified in the PDD. The fixed crediting period has been chosen and a fixed length of 10 years has been indicated.	1. Format is correct now. 2. The fixed crediting period is now correctly indicated. CAR is closed. þ
Corrective Action Request No.49. The PDD should indicate in D.1. the environmental installation licence (date, environmental authority, number) showing that LAR is in compliance with the environmental legislation.	D.2.2.	It has been indicated in B.1 the environmental installation licence data. *Licença de Instalaçao nº 8.200* *Valid until: April, 27th, 2011* *Protocol nº. 747 25 988* *Instituto Ambiental do Paraná*	Information about the environmental installation license has been provided in D.1. of the PDD. CAR is closed. þ
Corrective Action Request No.50. E.1. of the GSP PDD informs that "there is no requirement for conducting a stakeholder consultation process for this kind of project". This is not correct, once the DNA defines the minimum of stakeholders who have to be consulted and that the stakeholder process has to be carried out at least 15 days prior to the start of validation (resolution n° 7, from March 05, 2008, paragraph 1.). PPs are requested to revise and inform that the by the DNA requested stakeholders have been consulted.	E.1.3.	This has been modified in the PDD. The Brazilian DNA requires the project proponent to invite some specific entities considered to be "affected" by the project activity, 15 days before the commencement of the validation process. During the site visit, the project proponent realized that there were some of those required entities that had not been invited to the meeting by mistake. Although this situation could seem not to be in accordance with DNA procedures, the project participant asked the DNA about the possibility of inviting these entities for comments after the stakeholders' meeting. The reply from the DNA stating that this invitation would also be valid, taking into account the comments re-	Even though not all stakeholders requested by the Brazilian DNA has been invited 15 days prior to the GSP, the DNA confirmed in an Email dated July 21, 2009 that this would not be a problem once the missing stakeholders would be invited and possible comments would be considered until the project is submitted to the Brazilian DNA. In the meantime all relevant stakeholders have been in-

		ceived by these entities in the final version of the PDD, has been submitted to the validator. On July, 8th, 2009, the project participant sent all the required entities a letter (version 2) referring the project activity and the PDD which was hosted at UNFCCC webpage. The acknowledgements of these invitations and the second version of the invitation letter have been submitted to the validator. After 30 days, no comments were received by the project participant by any of the invited entities.	vited. Evidence has been submitted to the validation team. CAR is closed. þ
Corrective Action Request No.51. The stakeholder letters of the Brazilian Forum of ONGs and Social Movements of the environment (Forum Brasileiro de ONG´s e Movimentos Sociais para o Meio Ambiente e Desenvolvimento) and State and Federal Public Ministries (Ministerio Publico Estadual and Ministerio Publico Federal) should be submitted to the validation team.	E.1.4.	The acknowledgement of the invitations sent to the Brazilian Form of ONGs and Social Movements of Environment (Forum Brasileiro de ONGs e Movimentos Sociais para o Meio Ambiente en Desenvolvimento) and to the State and Federeal Public Ministries, have been submitted to the validator. Please refer to CAR 50 to check these documents.	The evidence (acknowledgement of the invitations) confirming the invitation for comments of Brazilian Forum of ONGs and Social Movements of the environment (Forum Brasileiro de ONG´s e Movimentos Sociais para o Meio Ambiente e Desenvolvimento) and State and Federal Public Ministries (Ministerio Publico Estadual and Ministerio Publico Federal) has been submitted to the validation team. CAR is closed. þ
Corrective Action Request No.52. The information should be updated as according to the requests stated in other relevant CARs.	F.4.1.	The monitoring information has been updated in the PDD in accordance with the CARs arisen in this Protocol. The summary of monitoring parameters, as it has been considered unnecessary for the project develop-	B.7.2. has been updated, however only by closing the other open CARs, this CAR will be closed.

		ment, has been removed from the PDD.	CAR is closed. þ
Clarification Request No. 1. Please clarify in A.2. whether the excess bio-gas will be flared in an open or enclosed flare system.	A.2.5.	The excess biogas will be flared in an open flare due to security reasons. However, the project proponent will relinquish the emission reductions resulting from the excess biogas combusted in the open flare. Gas analyzer, biogas flowmeter and open flare will be installed after a bidding process which has not taken place in the moment of sending this Validation Protocol. However, the memorial with the required characteristics for the equipment, have been submitted to the validator. 1. Mass flow of biogas flared; 2. Mass flow of methane in biogas (dry basis, Nm3); 3. Determination of flare operation through flare detection; 4. Data recording in PLC to be used yearly; 5. Control the valve opening and closing according to pressure value in biodigesters. For the gas flowmeter, the specifications are the follow-ing: 1. Mass thermal flowmeter with temperature and pressure correction, giving measurements in Nm3. Measurement value and time will be sent to a PLC. The bid for these equipment is expected to have the deadline on August, 30th, 2009. After two months from the signature of the contract, the equipments are expected to be installed at Cooperativa Lar Wastewater Treatment Plant.	It is clearly indicated in the PDD now that the excess biogas will be flared in an open flare. CR is closed. þ

Clarification Request No. 2. Please demonstrate that the technology implemented by the project activity will be environmentally safe and include some information in A.4.2. of the PDD.	A.4.2.5.	The technology implemented is environmentally safe since the total amount of wastewater generated in the production process is treated in the plant. Moreover, methane emissions to the atmosphere are drastically reduced to almost zero. The biogas generated will be used to generate electricity that will be used for internal purposes at Lar's industrial facilities or exported to the grid. Thus, the project activity will contribute to reduce the electricity consumption from the grid when used for internal purposes or will displace electricity generated from other polluting sources when exported to the grid. Apart from this, the designed treatment will reduce organic matter in treated water compared to the current treatment. Also, a tertiary treatment, which is out of the project boundary, will be implemented. This tertiary treatment will allow to reuse the 70% of the treated water in the production process while the remaining 30% will be used for irrigation purposes. By reducing the water consumption associated to the production process, Cooperativa Lar contributes to maintain the river's ecosystem. Not only the technology implemented in the proposed project is environmentally safe but also, contributes to improve environmental conditions in the nearby ecosystems and to reduce water consumption in the production process. The technology implemented consists on the modification of the current treatment, in which only the outflow water discharge parameters are considered, to a different treatment concept in which water reuse, biogas recovery and utilization for renewable energy generation	It has been convincingly explained in A.4.2. of the PDD now, that the project activity is environmentally safe. The same has been confirmed during the on-site visit. CR is closed. **þ**

		are considered and conform the pillars of the project activity. The environmental impact of these measures is limited to a foreseen increase in the electricity consumption due to the installation of new mechanical equipments. In fact, Cooperativa Lar got the Environmental Licence for the development of the proposed project activity. This has been explained in the PDD in section A.4.2.	
Clarification Request No. 3. Please provide evidence that open anaerobic lagoons and physical treatment systems are common practice in (chicken) slaughterhouses.	A.4.2.7.	In the additionality discussion and barriers explanation, it has been demonstrated that it is a common practice in Brazil to treat wastewater from slaughterhouses and other animal manures, in stabilization lagoons, which are physical treatments. All the barriers included have been referenced in the PDD. **Answer 2:** The following references have been included in the PDD and submitted to the validation team: 2006 IPCC Guidelines for National Greenhouse Gas Inventories". Chapter 6. Wastewater Treatment and Discharge. Page 20. ***"The meat and poultry processing facilities typically employ anaerobic lagoons to treat their wastewater"*** "Brazil Profile for Animal Waste Management" Methane	A concrete evidence is still missing to confirm that open anaerobic lagoons and physical treatment systems are the common practice in chicken slaughterhouses. **2nd answer:** Sufficient evidences have been submitted to the validation team demonstrating that open anaerobic lagoons and physical treatment systems are the common practice in animal waste management systems in Brazil (amongst others in poultry processing facilities). CR is closed. **þ**

		to Markets Agriculture Subcommittee, December, 2006 http://www.methanetomarkets.org/resources/ag/docs/brazil_profile.pdf *"**Currently, anaerobic lagoons correspond to the baseline for CDM projects based on mitigation of greenhouse gases from animal wastes management systems"*** "Fiscal 2006 CDM/JI Project Research Swine Farms in the State of Santa Catarina, Brazil". The Japan Research Institute. March, 2007. http://gec.jp/gec/gec.nsf/3d2318747561e5f549256b470023347f/0af2af9a8f44acab4925730d002ebb86/$FILE/Summary_JapanResearch.pdf *"Identification of alternative scenarios for proposed CDM project activities:* ***There are two alternative methods that can be considered, namely the "anaerobic lagoons" that are generally used in Brazil**, and "anaerobic digesters", which are more advanced but rarely adopted.* *Barrier Analysis: Substantial investment is needed for anaerobic digesters, and detailed monitoring and system maintenance need to be performed. On the other hand, anaerobic lagoons represent simple and inexpensive technology, with straightforward operation and maintenance. **Anaerobic lagoons should be installed as the baseline scenario from the perspective of both investment and technological barriers".*** "Treatment and control of industrial effluents". Engo. Gandhi Giordano, D.Sc, Prof. Adjunto do Departamento	

		de Engenharia Sanitária e do Meio Ambiente – UERJ Diretor Técnico da Tecma-Tecnologia em Meio Ambiente Ltda. http://www.ufmt.br/esa/Modulo_II_Efluentes_Industriais/Apost_EI_2004_1ABES_Mato_Grosso_UFMT2.pdf "The processes largely developed in Brazil consist in up to three stages: preliminary, primary and secondary: Ø Preliminary: sieving for entrail removal, grease separation. Ø Secondary: **lagoons – use of a serial of anaerobic,** facultative and algae lagoons. In case that no space was available for the implementation of lagoons, the preliminary process would be completed with an equalization tank, a physical chemical flotation and a biologic treatment with activated sludge."	
Clarification Request No. 4. After checking the Email communication between LAR (Ansberto R. do Passo Neto) and Zeroemissions (Javier Becerra Sanchez) in April 2008, the validation team is in doubts whether the information about 3 anaerobic lagoons in the PDD (what was as well communicated to the team during the on-site visit) for the baseline scenario is correct. In the Email from 12/04/2008 Passo Neto indicates to Becerra Sanchez **2 anaerobic lagoons, one aerated lagoon**, 4 facultative lagoons and 3 polishing lagoons ("Processo industri: al – peneiras- flotador – lagoa Anaerobica 01 – Lagoa Anaerobica 02 – Lagoa Aerada –	B.2.1.7.	The baseline scenario consists of three serial anaerobic open lagoons. During the site visit, the current status of the plant was seen. The two biodigesters have started to store the biogas generated, wastewater from them flows to a third anaerobic lagoon (without any aeration system), open, and, after that, to an aerated lagoon which clearly is poorly managed since aeration did not reach the whole lagoon surface. In the moment of the site visit, the only modification made in the wastewater treatment plant was the modification of lagoons 1 & 2 into biodigesters. The auditor could see that, after the biodigesters, another anaerobic lagoon operates. This is the third an-	The visual inspection is not evidence enough to the validation team to conclude that the lagoon after the 2 biodigester lagoons is an anaerobic lagoon. Until now no concrete evidence for this 3rd anaerobic lagoon has been provided and the Email mentioned in CR 4 mentions 2 anaerobic lagoons. PPs are kindly requested to provide a concrete evidence for the 3rd anaerobic lagoon.

seguindo para mais 04 lagoas Facultativas e 03 lagoas de polimento"). Concrete evicence(s) for a possible 3rd anaerobic lagoon should be submitted to the validation team, since all submitted documents until now do not mention such a 3rd anaerobic lagoon.		aerobic lagoon considered in the baseline. Regarding the email, it was a misprint in the explanation. **3rd Answer:** Two emails from Cooperativa Lar to Zeroemissions do Brasil have been submitted to the validation team. In both emails, Cooperativa Lar explains the size of each treatment system, including the three anaerobic lagoons. The first email is from June/08 and the second is from November/08. The final configuration of the project treatment was being discussed, considering the possibility of installing four digesters. The final configuration decide has been deeply explained in the PDD. **4th answer:** The original emails have been sent to the validator.	**2nd answer:** No response has been provided by the PPs. Thus CR 4 remains open. **3rd answer:** Please provide the original Emails in Outlook format. **4th answer:** The original emails (IRL 50) have been submitted to the validation team and clearly mention the existence of 3 anaerobic lagoons in the baseline scenario. CR is closed. **þ**
Clarification Request No. 5. The environmental control plan, page 10 (IRL 7) mentions the "annual cleaning of the septic tank (about 2 tons/year of sludge)". What the sludge will be used for and how the same will be monitored (end use of final sludge)? Please clarify.	B.3.1.	The use of this sludge will be the same in the project activity than currently. In the current scenario, the septic sludge is removed by a company authorised by IAP (Instituto Ambiental do Paraná). The sludge treatment done by this company consists of a Septic Tank and Drains Effluent Treatment Plant. The same procedure will be carried on in the project scenario. The environmental licence of the company has been sent to the validator.	The answer of the PPs is accepted by the validation team. The removal of the septic sludge already occurs in the baseline scenario and will continue in the same way in the project scenario. CR is closed. **þ**
Clarification Request No. 6. Please clarify whether the proposed project activity involves the consumption of diesel	B.6.2.2.8.	Apart from the septic sludge, which will receive the same treatment before and after the project implementation and to which the increase in production of chicken does not affect (since it is a separated stream),	It has been clarified that no additional fossil fuels (compared to the baseline scenario) will be consumed in

fuel oil or any other fossil fuel (amongst others for **sludge treatment**) and include the respective parameters into B.6.2. and B.7.1. if this was the case. The calculation steps should be indicated if fossil fuel is really consumed.		the proposed project does not involve the consumption of fossil fuels. Aeration equipment and other mechanical equipment to be installed due to the implementation of the project, operate by consuming electricity. A part of the power consumed will be supplied by the biogas engines and the remaining will be supplied from the grid. These emissions associated to power consumption have been calculated and indicated in the PDD. Since there is no sludge generation associated to the proposed project activity, there is no sludge treatment, as it has been explained in the PDD.	the project activity. Electricity consumed will be supplied by the biogas engines as well as by grid electricity. Emissions associated to power consumption are considered as project emissions in the PDD. CR is closed. **þ**
Clarification Request No. 7. The PPs should clarify what type of gas flow meter (measuring just gas flow or besides gas flow as well temperature and pressure) will be used in the proposed project activity. Depending on that, temperature and pressure of biogas have to be monitored or do not need to be monitored (refer to §36 AMS III.H).	B.7.1.2.17.	Mass thermal flow meter with temperature and pressure correction, giving measurements in Nm3. Measurement value and time will be sent to a PLC. This has been included in the PDD. By the moment, there is no confirmation of the specific flow meter to be installed as Cooperativa Lar will choose between several bidders. The specifications required for the gas flow meter have been submitted to the validator.	PPs decided to use thermal flow meter which correct the biogas flow by considering temperature and pressure into Nm3. Thus, temperature and pressure do not have to be monitored separately. CR is closed. **þ**
Clarification Request No. 8. The monitoring protocol mentioned in B.7.2. of the PDD should be submitted to the validation team.	B.7.2.3.	The commitment of Zeroemissions to implement the proper Monitoring Procedures for Lar Project was submitted to the validator. Procedures for monitoring will be finished and will start to be implemented before the project registration under CDM.	The monitoring protocol has been submitted to the validation team and gives a first rough idea about the monitoring procedures for the LAR project. The detailed monitoring procedures will be presented at verification activities. CR is closed. **þ**

Clarification Request No. 9. Is the person responsible for the application of the baseline and monitoring methodology (Jose de la Camara) and indicated in B.8. still up-to-date? Please clarify.	B.8.1.4.	The persons responsible of the application of the baseline and monitoring methodology have been indicated in section B.8 of the PDD.	Information about the responsible persons in B.8. has been updated. CR is closed. **þ**
Clarification Request No. 10. PPs should think about it whether the information provided in Annex 3 is really fundamental in order to support/substantiate statements given in other sections of the PDD. Different more project specific information could be provided here, like amongst others details about the calculation of the emissions factor.	F.3.3.	The information in annex 3 is not necessary to understand, support or substantiate the statements given in the PDD. Moreover when the technology to be implemented has been deeply explained in the PDD. The information in annex 3 has been deleted.	Information in annex 3 has been deleted. CR is closed. **þ**
Open issue: The Letters of Approval of Spain and Brazil should be submitted to the validation team.	A.3.2.	The PP finally decided to apply for the Letter of Approval for voluntary participation of Annex 1 country in the Netherlands, taking advantage on the permanent office in Brussels and due to lower administrative costs (translations, etc) and lower issuance time required in the Netherlands than in Spain. The Letter of Approval from Netherlands was issued on 29th, April, 2010. Hence, the Annex 1 country appearing in the PDD has changed from Spain to Netherlands. The LoA from the Host Country (Brazil) is still pending.	The Letter of Approval for the PP "Zero Emissions Technologies SA" has been issued by the DNA of the Netherlands (Ministry of Housing, Spatial Planning and the Environment (VROM)) on April 29, 2010 (IRL 118). The Name of the Party involved in A.3. of the PDD has been changed from Spain to Netherlands respectively. The LoA from the Host Country (Brazil) is still pending. Open
Additional CARs due to new Guidelines/Procedures and updating of methodologies			

Corrective Action Request No.53. The versions of the methodologies should be updated to AMS III.H / version 13, AMS III.I / version 08 and AMS I.D / version 15, as the project can´t be submitted at time with any of the previous versions of the methodologies.	N/A	Versions of the applied methodologies have been updated as requested throughout the PDD.	The validation team confirms that the versions of the methodologies have been updated as requested. The following versions are used now: AMS III.H / version 13, AMS III.I / version 08 and AMS I.D / version 15. No significant changes in the PDD were necessary due to the update of the versions, as major changes in the methodologies have no impact on the proposed project activity. CAR is closed. **þ**
Corrective Action Request No.54. As sampling of some parameters is involved in the proposed project activity, the General Guidelines for Sampling and Surveys for Small Scale CDM Project Activities (EB50, Annex 30) should be followed. The PDD should include a sampling plan with a description of the sampling approach, important assumptions, and justification for the selection of the chosen approach.		The only parameter suitable to be statistically estimated is the outlet COD from each treatment system. This is a critical parameter that directly affects the calculation of emission reductions. The value considered for ER calculation is the annual mean of COD outlet from each treatment system affected by the project activity, which is calculated from a sample of COD measurements taken during the year. The minimum sample size required to ensure a 90/10 confidence/precision interval has been calculated and the explanation has been included in the PDD in Annex 4. Annex 4 of the PDD shows the sampling plan step by step as required by the Guidelines for Sampling and Surveys for SSC CDM project activities. The respective excel file for calculating the sampling parameters has been submitted to the DOE.	Annex 4 of the PDD mentions a sampling plan for the values of COD at different points. The sampling plan fulfils the requirements according to paragraph 33 and 34 of the Guideline for Sampling and Surveys for SSC CDM project activities (EB50, Annex 30). An excel file (IRL 104) with the calculation of the sampling parameters have been submitted to the validation team and was verified by the same. CAR is closed. **þ**

		In this file, COD outlet values from the baseline scenario have been considered to calculate the sample size. Data available are those from 2007 and 2008 used for the baseline COD calculation. For calculating average COD, the PP has removed max and min values in order to result in a more robust value. Without max and min values, mean and variance have been calculated. In the project scenario, COD values are expected to be more controlled and less variable than in the baseline situation. Hence, variance is expected to be lower and, thus, minimum sample size is also expected to be higher, according to the formula applied for the sample size calculation.	

Table 3 Unresolved Corrective Action and Clarification Requests (in case of denials)

Clarifications and / or corrective action requests by validation team	Id. of CAR/CR	Explanation of Conclusion for Denial
-	-	-

Annex 2: Information Reference List

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
1	18-05-2009	PDD "Cooperativa Lar Wastewater Treatment and Energy Generation Project", Version 01	Zeroemissions do Brasil	GSP PDD
2	02/07/2009- 04/07/2009	On-site interviews conducted by TÜV SÜD. **Validation Team:** Johann Thaler, Assessment Team Leader, TUEV SUED **Interviewed Persons:** Ansberto R. do Passo Neto, Chemical Engineer, Cooperativa Agroindustrial LAR (in the following called just "LAR") James Morais Environmental Technologist, Cooperativa Agroindustrial LAR Javier Becerra Sanchez, Carbon Implementation Manager, Zeroemissions do Brasil Ana Carnal Andres-Montalvo, Carbon Implementation Manager, Zero Emissions Technologies SA Ferran Tejada Valero, Carbon Implementation Manager, Zeroemissions do Brasil Eduardo Ferreira, Project Developer, Zeroemissions do Brasil Saulo de Tarso Granemann Lucena, Technician in agricultural and industrial licensing, Paraná Environmental Institute IAP, Telephone interview in December 2009.		
3	02/07/2009	Participant list of on-site interviews	TÜV SÜD	
4	EB 50	AMS I.D, "Grid connected renewable electricity generation", version 15	UNFCCC	
5	EB 48	AMS III.H "Methane recovery in wastewater treatment", version 13	UNFCCC	
6	EB 48	AMS III.I, "Avoidance of methane production in wastewater treatment through replacement of anaerobic systems by aerobic systems, version 08	UNFCCC	

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
7	03/2009	Environmental Control Plan (Plano de Controle Ambiental)	Cooperativa Lar	Approved by the State Environmental Authority IAP (Parana), on 24/03/2009
8	27/04/2009	Environmental installation license, N° 8200	IAP (Instituto Ambiental do Parana)	Valid until 27/04/2011
9	04/2003	Environmental Control Plan (Plano de Controle Ambiental)	Cooperativa Lar	Approved by the State Environmental Authority IAP (Parana), on 06/11/2003
10	03/02/2009	Power Purchase agreement between COPEL and Cooperativa Lar for decentralized generation, N° 05/2009	COPEL & Cooperativa Lar	Justification of sale price of electricity and limitations of electricity export to the grid.
11	03/02/2009	Grid connection and distribution approval, N° 04/2009	COPEL	
12	10/06/2009	Authorization ANEEL for the implementation and operation of a small electricity plant, N° 477/2009	ANEEL	
13	06/02/2009	Declaration that no ODA from Annex I Parties is involved in the proposed project activity.	LAR	
14	05/05/2008	Financing contract FINEP, N° 5204/06	FINEP	
15	15/01/2009	Purchase agreement for biodigesters between ITAI (executive organ FINEP) and AVESUY	ITAI	
16	20/06/2008	**Evidence for the project´s starting date:** First invoice for ground preparation work at the 1st anaerobic lagoon for the biodigester (evidencing the construction start)	LAR	Various other subsequent invoices (for ground preparation works) have been presented to the validation team during the on-site visit.
17	02/03/2009	Purchase agreement for 2 generators between ITAI and BIOGAS Motores Estacionarios Ltda.	ITAI	

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
18	25/08/2006	**Evidence for CDM consideration:** Project Idea Note “Desenvolvimento de modelo de geracao distribuida com saneamento ambiental”, version 1.0	Itaipu, Copel, Sanepar, LAR, IAP, LACTEC, FPTI	On page 19, the document refers to CDM.
19	19/03/2007	Proposal AgCert about the implementation of a biogas CDM project	AgCert	
20	12/08/2008	Letter of Intent signed by LAR about CDM consulting services and CER purchase	LAR	
21	25/09/2008	Emission reduction Purchase Agreement (ERPA)	Between Cooperativa Agroindustrial Lar and Zeroemissions do Brasil Ltda.	
22	February 2009 and July 2009	Stakeholder invitation letters per Email and announcement at LAR´s website	LAR	
23	16/02/009	F-CDM-Modalities of Communication	Cooperativa Lar	
24	06/02/1997 and 12/12/201	Official land registry (N° 47.142) and change of juridical name from “Cooperativa Agropecuaria – Tres Fronteiras Ltda.” to “Cooperativa Agroindustrial LAR” (N° 54.721)	Registro de Imoveis Matelandia, Parana	
25	26/02/2009, 09/03/2009, 28/04/2009	Invoice, N° 006218, geomembranes, dated 26/02/2009, N° 006235 dated 09/03/2009, N° 6311, dated 28/04/2009 issued to ITAI (executive organ FINEP)	Avesuy	
26	19/05/2009	Proposal for the civil construction (stage 2)	Paulo COLPO, Projetos Industriais	
27	09/2008	Public tendering for biodigester project study	ITAI	

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
28	29/04/2009	Final Report of the biodigester project	PLANOTEC	
29	06/02/2009	Declaration that technology will not be substituted by other or more efficient technologies with the CDM project period.	LAR	
30	Submitted during on-site visit	Photos of the anaerobic lagoons in the baseline scenario and its cleaning process	LAR	
31	14/04/2009 and 01/06/2009	2 Proposals for the purchase of open flare	COMBUSTEC and ECOGAS	
32	January 2007 to November 2008	COD samples of wastewater at different points of the wastewater treatment system	LAR / PSS / SENAI	Sampling has been taken as per the "Standard Methods for the examination of water and wastewater, 20th Edition" and mostly at the time at least monthly.
33	Download during the on-site visit	Weather records from the State of Parana	Instituto Agronomico do Parana (Agronomic Institute of Parana)	
34	29/04/2009	Contract between ITAI and C R Razente Construcoes Ltda. for civil construction of the power house	ITAI	
35	03/07/2009	GPS coordinates taken during the on-site visits	LAR/Zeroemissions	GPS coordinates were taken both at the location between the 2 biodigesters and of the physical chemical equipment.
36	Without date	CER excel calculation sheet, version 2	Zeroemissions	Version 2 was submitted during the on-site visit and was used for assessment by the validation team as version 1 was not available in English language.

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
37	01/06/2009 02/06/2009	Daily records of wastewater flow	LAR	1st and 2nd June are examplarily mentioned
38	22/06/2009	Lifetime of the biodigester cover (10 years)	AVESUY	Email sent from Avesuy to LAR
39	03/1998	Excel calculation file for the calculation of the volumetric loading rate and relevant explanations	EMBRAPA	
40	March/April 2008	Email conversation between LAR (Ansberto R. do Passo Neto) and Zeroemissions (Javier Becerra Sanchez)	LAR/Zeroemissions	
41	EB 41	General guidance to SSC methodologies	UNFCCC	Paragraph 14
42	EB 49	Guidance on the demonstration and assessment of prior consideration of the CDM, version 03	UNFCCC	EB49, Annex 22
43	Decision 3/CMP.1	Attachment A to Appendix B of the simplified modalities and procedures for SSC CDM project activities	UNFCCC	
44	2006	IPCC guidelines	IPCC	
45	EB 28	Methodological “Tool to determine project emissions from flaring gases containing methane”	UNFCCC	

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
46	17/07/2009	Expected schedule of implementation of the project activity.	Cooperativa Lar	Expected implementation
47	01/08/2006	Decentralized Power Generation Programme (Programa de Geraçao Distribuida) Project Requirements Definition (DPR- Definiçao de Requisitos do Projeto) Most important parts submitted in English.	Itaipú Binacional, COPEL, Sanepar, Cooperativa Lar, IAP, LACTEC and PTI.	Document prepared by Cooperativa Lar together with the participants in the Decentralized Power Generation Programme to apply for financial aid to FINEP. CDM Consideration together with IRL 18
48	22/09/2009	Calculation of lagoon volume needed for increased flow	Cooperativa Lar / Zeroemissions and Paulo COLPO Projetos Industriais Ltda.	Baseline establishment
49	12/06/2008	Email from Cooperativa Lar to Zeroemissions do Brasil regarding the lagoons’ size in the process	Cooperativa Lar	Baseline information
50	21/11/2008	Email from Cooperativa Lar to Zeroemissions do Brasil regarding the lagoons’ configuration	Cooperativa Lar	Baseline information
51	17/08/2009; 13/11/2009; 19/11/2009	Invoices, N° 0021, 0043, 0045: diffusers in aeration lagoon.	PlanoA	
52	2008	Fund allocation from FINEP	FINEP	Total financial aid from FINEP. Investment analysis
53	2008	Invoices for anaerobic lagoons adaptation and cleaning: Slope construction, machinery, technical assistance, cleaning works, mechanical services, hydraulic excavation	-Transportadora e terraplanagem Iguaçu (N° 226,227,230,233,234) -Paulo Colpo	

			Projetos Industriais (N° 193) -A.M.V. Limpezas (N° 040) -Schoeler (N° 1253) -Affito (N° 076)	
54	September 2008 until August 2009	Monthly electricity invoices	COPEL Electricity distribution company	Electricity price, Investment analysis
55	27/10/2008	Budget for lagoons excavation (Orçamento de execuçao)	Paulo Colpo Projetos Industriais Ltda	Budget for lagoons excavation. Investment comparison analysis
56	03/03/2009	Budget for implementation of the second stage of the project	Gratt Industria de Maquinas Ltda	Budget for implementation of the project. Investment comparison analysis See as well: http://www.gratt.com.br
57	11/2009 and 12/12/2009 (final)	Investment comparison table (excel file)	Cooperativa Lar / Zeroemissions	Investment comparison analysis
58	EB50	Guidelines for objective demonstration and assessment of barriers	UNFCCC	EB50, Annex 13
59	12/02/2009	Invoice excavation works, N° 6200 issued to ITAI (executive organ from FINEP)	Avesuy	
60	07/07/2009	Quotation for Methane Analyser nº 2964	Yorgos Ambiental	
61	16/02/2009	Invoice PVC pipeline, N° 6211 issued to ITAI (executive organ from FINEP)	Avesuy	
62	14/05/2009 and 06/08/2009	Invoices N° 237 and N° 245 about electricity generation set 2 x 50 kVA issued to ITAI (executive organ FINEP)	Biogas Motores Estacionarios Ltda.	
63	First date mentioned in the report 12/02/2009	Report of activities	Cooperativa Lar / Zeroemissions	
64	24/11/2009	Budget for lagoons excavation (Orçamento de execuçao)	JAMAR	

			Terraplanagem e Transporte	
65	04/12/2009	Invoices Nº 219 (Manpower for biogas pipeline execution) & N° 220 (Execution of biogas generators warehouse).	Paulo Colpo Projetos Industriais	
66	2006	Sustainability Report. Itaipú 2006 http://www.itaipu.gov.br/files/sustentabilidade_2006.pdf Most important parts submitted in English	Itaipú	**Barrier analysis**
67	05/05/2008	Application for financial aid from FINEP. Most important parts submitted in English	Ministry of Science and Technology	Barrier analysis
68	Not specified	The Brazilian Innovation Agency. FINEP: Research and Projects Financing http://www.finep.gov.br//english/folder_ingles.pdf	FINEP	Barrier analysis

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
69	2005	Application of soluble enzymes to wastewater treatment with high lipid content. (Aplicaçao de lipases no tratamento de aguas residuárias com elevados teores de lipídeos) http://quimicanova.sbq.org.br/qn/qnol/2005/vol28n2/21-DV03325.pdf Most important parts translated into English.	A. Aguiar Mendes, H. Ferreira de Castro, Departamento de Engenharia Química, Faculdade de Engenharia Química de Lorena	Barrier analysis
70	10/07/2003	Sistematizaçao de informaçoes técnicas e económicas sobre alternativas de tratamento de esgotos. http://www.usp.br/fau/pesquisa/infurb/urbagua/mf1/mf1.pdf Most important parts translated into English.	University of Sao Paulo. Convenio FINEP CT-HIDRO	Barrier analysis
71	2004	“Technical evaluation of a stabilization lagoons based system treating poultry effluents” (Avaliaçao técnica de um sistema de lagoas de estabilizaçao tratando efluentes de frigorífico de frangos) http://www.ufpel.edu.br/cic/2004/arquivos/conteudo_EN.html#01070 Most important parts translated into English	Vieira, A. C. D. T.; Boeira, J. B.; Kaster, B.; Köetz, P. R.; Mutoni, F.	Barrier analysis
72	Not specified 19th Brazilian Congress in Environmental Engineering	Evaluation of operation in stabilization lagoons in wastewater treatment from slaughterhouse. (Avaliacáo do desempenho de lagoas de estabilizaçao no tratamento de efluentes de matadouro). http://www.bvsde.paho.org/bvsacd/abes97/matodouro.pdf Most important parts translated into English	Carlos Nobuyoshi Ide. ABES - Associação Brasileira de Engenharia Sanitária e Ambiental.	Barrier analysis

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
73	2002	First Brazilian Inventory of Anthropogenic Greenhouse Gas Emissions. http://homologa.ambiente.sp.gov.br/biogas/docs/relatorios_referencias/tratamento_de_residuos/rr_90_94_ingles.pdf	Ministry of Science and Technology. Sônia Maria Manso Vieira João Wagner Silva CETESB	Barrier analysis
74	After 2006	Effluent management in poultry slaughterhouses: case study (super frango) *(Gerenciamento de efluentes de abatedouros avícolas estudo de caso (super frango))* *http://www.ucg.br/ucg/prope/cpgss/ArquivosUpload/36/file/Continua/GERENCIAMENTO%20DE%20EFLUENTES%20DE%20ABATEDOUROS%20AV%C3%8DCOLAS%20-%20ESTUDO%20DE%20CASO%20SUPER%20FRANGO.pdf* Most important parts translated into English	J.Fernandes Jr, O Mendes. Universidade Católica de Goiás – Departamento de Engenharia – Engenharia Ambiental	Barrier analysis
75	Not specified	Evaluation of the treatment efficiency in wastewater treatment systems in slaughterhouses with stabilization lagoons and post-treatment in cultivated bed. (Abstract) (Avaliaçao da eficiencia de sistemas de tratamento de efluentes de matadouro tratados por lagoas de estabilizaçao e postratamento em banhados artificiais de leitos cultivados) http://www.unb.br/ft/enc/recursoshidricos/artigo122.pdf Most important parts translated into English	A.Garcia Arnal Barbedo, L.Marques Imolene, C.Nobuyoshi Ide, K.Francis Roche, J.Gonda.	Barrier analysis

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
76	2007	Perspectives for the water conservation and reuse in the food industry – Study in a poultry slughterhouse unit. *(Perspectivas para conservaçao e reuso de agua na industria de alimentos-Estudo de uma unidade de processamento de frangos)* *http://www.teses.usp.br/teses/disponiveis/3/3147/tde-04072007-125053/* Most important parts translated into English	E.Myho Matsumura. Dissertaçao apresentada a Escola Politécnica da Universidade de Sao Paulo.	**Barrier analysis**
77	04/2003	Developed technologies for swine manure management *(Tecnologías desenvolvidas pela embrapa suínos e aves para o tratamento de dejetos suínos)* Most important parts translated into English.	Martha Mayumi Higarashi	Barrier analysis
78	1986	Paraná experience in wastewater treatment in small and medium scale. Abstract. *(Experiência paranaense de tratamento de esgotos em pequena e média escala)* *http://bases.bireme.br/cgi-bin/wxislind.exe/iah/online/?IsisScript=iah/iah.xis&src=google&base=REPIDISCA&lang=p&nextAction=lnk&exprSearch=102936&indexSearch=ID* Most important parts translated into English	Bollmann, Harry Alberto; Aisse, Miguel Mansur; Gomes, Celso Savelli..	Barrier analysis

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
79	2009	Evaluation of the anaerobic biodegrability of wastes in bovine and swine industry. *(Avaliação da biodegradabilidade anaeróbia de resíduos da bovinocultura e da suinocultura)*. http://www.scielo.br/scielo.php?pid=S0100-69162004000200025&script=sci_arttext Most important parts translated into English	LM. Moraesl; DR.Paula Jr. Eng. Agríc. vol.24 no.2 Botucatu Associação Brasileira de Engenharia Agrícola	Barrier analysis
80	05-08/2004	Systematization of technical and economical information about alternatives in wastewater treatment” *(Sistematizaçao de informaçoes técnicas e económicas sobre alternativas de tratamento de esgotos)* *http://www.usp.br/fau/pesquisa/infurb/urbagua/mf1/mf1.pdf* Most important parts translated into English	Universidade de Sao Paulo. Núcleo de Pesquisa e Informaçoes Urbanas	Barrier analysis
81	21/05/2008	Aneel authorizes the generation of electricity in rural areas *(Aneel autoriza geração de energia em propriedades rurais)* *http://www.rts.org.br/noticias/destaque-2/aneel-autoriza-geracao-de-energia-em-propriedades-rurais* Most important parts translated into English	Envolverde/Itaipú	Barrier analysis
82	2009	Institutions and enterprises get together for electricity generation from biogas *(Instituições e empresas fazem parceria para gerar energia a partir do biogás de esgotos)* *http://www.revistafatorbrasil.com.br/ver_noticia.php?not=536* Most important parts translated into English	Fator Brasil. Magazine	Barrier analysis

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
83	20/03/2007	Effluent treatment in an ostrich slaughterhouse Most important parts translated into English	Brazilian Service of Technical Responses	Barrier analysis
84	2008	Slaughterhouses: Bovine and Swine Industry, Goverment of Sao Paulo. *(Frigoríficos industrializaçao da carne bovina e suína)* *http://www.cetesb.sp.gov.br/Tecnologia/producao_limpa/documentos/graxaria.pdf* Most important parts translated into English	CETESB - Environmental Sanitation Technology Company & FIESP – Industries Federation of the State of Sao Paulo	Barrier analysis
85	01/12/2006	Brazil Profile for Animal Waste Management http://www.methanetomarkets.org/resources/ag/docs/brazil_profile.pdf Most important parts translated into English	Methane to Markets Agriculture Subcommittee	Barrier analysis
86	03/2007	Swine Farms in the State of Santa Catarina, Brazil. Research into Effective Commercial Applications of Biogases (Overview) http://gec.jp/gec/gec.nsf/3d2318747561e5f549256b470023347f/0af2af9a8f44acab4925730d002ebb86/$FILE/Summary_JapanResearch.pdf	The Japan Research Institute, Ltd.	**Barrier analysis**

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
87	2004	Treatment and control of industrial effluents *(Tratamiento e controle de efluentes industriais)* *http://www.ufmt.br/esa/Modulo_II_Efluentes_Industriais/Apost_EI_2004_1ABES_Mato_Grosso_UFMT2.pdf* Most important parts translated into English.	Engo. Gandhi Giordano, D.Sc Assistant techer to the Sanitary Engineering in Environment Technical Director of Tecma-Technology in Environment Ltd.	**Barrier analysis**
88	07/1998	National Methane Inventory for Waste Management in Brazil http://homologa.ambiente.sp.gov.br/proclima/publicacoes/publicacoes_portugues/inventario_de_residuos_brasil.pdf Most important parts translated into English	CETESB	Increase in the use of anaerobic reactors for industrial effluent treatment. **Barrier analysis**
89	23/10/2002	Wastewater: the importance of treatment in the technological options. *(O esgoto: a importancia do tratamento e as opçoes tecnologicas)* http://www.biblioteca.sebrae.com.br/bds/BDS.nsf/38F13D0429D60A5B832574250051CFB9/$File/O%20esgoto%20-%20a%20import%C3%A2ncia%20do%20tratamento%20e%20as%20op%C3%A7%C3%B5es%20tecnol%C3%B3gicas.pdf XXII National Manufacturing Engineering Meeting, Curitiba, Paraná.	H.C Dias Pimenta, F.R. Macêdo torres, B. Silva Rodrigues, J. Martins da Rocha Jr. XXII National Manufacturing Engineering Meeting, Curitiba, Paraná.	Recommended wastewater treatment in Brazil, according to space availability

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
90	23/10/2002	Definition of stabilization lagoon. http://www.biblioteca.sebrae.com.br/bds/BDS.nsf/38F13D0429D60A5B832574250051CFB9/$File/O%20esgoto%20-%20a%20import%C3%A2ncia%20do%20tratamento%20e%20as%20op%C3%A7%C3%B5es%20tecnol%C3%B3gicas.pdf XXII National Manufacturing Engineering Meeting, Curitiba, Paraná. Most important parts translated into English	ENEGEP	Definition for baseline establishment
91	02/2008	Consideration of the alternatives for minimization of impacts generated by slughterhouse effluents. *(Levantamento das alternativas de minimização dos impactos gerados pelos efluentes de abatedouros e frigoríficos).* http://www.qualittas.com.br/documentos/Levantamento%20das%20Alternativas%20de%20Minimizacao%20dos%20Impactos%20-%20Tania%20Luisa%20Maldaner.PDF	Tania L. Maldaner. Universidade Castelo Branco	Barrier analysis. Definition of stabilization lagoons
92	2008	"Technical and environmental guidance on processing materials in slaughterhouses (bovine and swine)" *(Graxarias Processamento de Materiais de Abatedouros e Frigorificos Bovinos e Suínos*. http://www.cetesb.sp.gov.br/Tecnologia/producao_limpa/documentos/graxaria.pdf	CETESB	**Barrier analysis**
93	2004	"The potential reuse of water (treated effluents) in slaughterhouses", (O Potencial de Reuso de Água (Efluentes Tratados) em um Matadouro-Frigorífico). I Simposium of Environmental Engineering. (Anais do I Simpósio da Engenharia Ambiental). http://www.eesc.usp.br/sea/sea2004/arquivos/Anais_-_SEA-2004.pdf; page 83 & 85	João Pedro de Mello Forlani , Mônica Medeiros, Prof. M.Sc. Luis Fernando Rossi Léo. UNILIN	Prevailing practice barrier

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
94	29/07/2009	Clarification on Small Scale Methodology- SSC_324	UNFCCC	Combustion efficiency in generators
95	Not specified	Parshall flume technical specifications	EchoTREK	Accuracy and technical specifications
96	08/12/1998	Kinetic analysis of the key stages of low temperature methanogenesis	L.Ya. Lokshina, V.A. Vavilin. Water Problem Institute, Russian Academy of Sciences, 3 Gubkina str., 117971 Moscow, Russia	Retention time and methanogenesis.
97	Not specified	Anaerobic lagoons. Most important parts have been translated into English (Ref 46b)	http://cidta.usal.es/residuales/libros/lago/pdf/anaerobias.PDF R&D Technological Centre for Water. University of Salamanca, Spain.	Recommended retention time in anaerobic lagoons for anaerobic degradation

Ref.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
98	09/2002	Wastewater Technology Fact Sheet: Anaerobic Lagoons http://www.epa.gov/owmitnet/mtb/alagoons.pdf	United States Environmental Protection Agency	Detention time Typical detention times range from 1 to 50 days, depending on the temperature of the wastewater.
99	1997	Lagoon Systems Can Provide Low-Cost Wastewater Treatment http://www.nesc.wvu.edu/pdf/WW/publications/pipline/PL_SP97.pdf	The National Environmental Services Center Wet Virgina University	Facultative lagoons, advantages and disadvantages of lagoons systems.
100	2009	Hydrographic Region of Paraná http://pnrh.cnrh-srh.gov.br/	Ministry of Environment	Water consumption for irrigation purposes in Brazil. Contribution to sustainable development of the proposed project activity.
101	2006	Istanbul Congress 2006. http://www.aaqtic.org.ar/congresos/istanbul2006/Visual%20Displays/V%2025%20-%20Cost%20evaluation%20of%20sludge%20treatment%20options%20and%20energy%20recovery%20from%20wastewater%20treatment%20plant%20s.pdf	AAQTIC: Asociación Argentina de los Químicos y Técnicos de la Industria del Cuero. (Argentina Association of Chemicals and Technicians in the Leather Industry).	Difference between sludge treatment and physical solid separation. Documentation supporting that the removal of solids is not in the scope of the concept of sludge.
102	10/02/2010	**Final CER Calculation sheet**, version 06	Cooperativa Lar /Zeroemissions	CER Calculation Sheet
103	10/02/2010	**Final PDD** “Cooperativa Lar Wastewater Treatment and Energy Generation Project” Version 07	Zeroemissions	
104	Without date	Excel file “DATA COD Sampling” for the calculation of the sampling parameters, Email submitted on 16/11/2009.	Zeroemissions	

105	21/07/2009	Email Brazilian DNA concerning invitation of stakeholders	Brazilian DNA	
106	05/03/2008	DNA resolution n° 7, from March 05, 2008, paragraph 1	Brazilian DNA	
107	EB50	General guidelines for sampling and surveys for small-scale CDM project activities	EB50, Annex 30	
108	29/04/2009	Work order for LAR project	Zero Emissions Technologies SA	
109	23/11/2009	Notification from the Brazilian Communication Company „Forecast inflation for 2010 is slightly higher“ (http://www.agenciabrasil.gov.br/noticias/2009/11/23/materia.2009-11-23.7938623086/view)	Brazilian Communication Company	Forecast for inflation rates in 2010
110	11/09/2009	Invoice nº 1300. Adaptation of electrical facilities	ARZ Projetos e Instalaçoes Eletricas	
111	06/04/2009	Invoice nº 0993. Centrifugal pump	Atenas	
112	15/12/2009	COPEL Taxes and Tariffs for electricity (Most Important Parts translated into English) http://www.copel.com/hpcopel/root/nivel2.jsp?endereco=%2Fhpcopel%2Facopel%2Fpagcopel2.nsf%2Fverdocatual%2F5BAFDCF77F92F5A5032573EC006C3074	COPEL	Mentioning peak hours (18h to 21h except summer time) and 19h to 22h (in summer time)
113	29/08/2009	Proposal for efficient aerators from PlanoA (Most Important Parts translated into English)	PlanoA	
114	15/01/2010	Declaration of Gratt Industria de Maquinas Ltda about common practice for wastewater treatment of poultry slaughterhouses in Parana State	Gratt Industria de Maquinas Ltda	The declaration confirms that the common practice of poultry slaughterhouses for wastewater treatment are anaerobic lagoon systems.
115	20/01/2010	Declaration of Avesuy about common practice for wastewater treatment of poultry slaughterhouses in Parana State	AVESUY	The declaration confirms that the common practice of poultry slaughterhouses for wastewater treatment are anaerobic lagoon systems.
116	09/01/2010	Email sent from Technician (Saulo de Tarso Granemann Lucena) in agricultural and industrial licensing IAP (Paraná Environmental	IAP (Paraná Environmental	The Email confirms that the common practice of poultry slaughterhouses for wastewater treatment

		Institute)	Institute)	are anaerobic lagoon systems.
117	EB50,	Indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories” version 12.1 (EB50)		
118	29/04/2010	Letter of Approval Netherlands for the PP Zero Emissions Technologies SA	Ministry of Housing, Spatial Planning and the Environment (VROM) (Netherlands)	