



VALIDATION REPORT

“ESTRE PEDREIRA LANDFILL GAS PROJECT (EPLGP)” IN BRAZIL

REPORT No. 2006-1219

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DET NORSKE VERITAS



VALIDATION REPORT

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Client: CDR Pedreira – CENTRO DE DISPOSIÇÃO DE RESÍDUOS LTDA.	Client ref.: Alex Schlosser

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Summary:

Det Norske Veritas Certification Ltd. (DNV) is performing a validation of the “Estre Pedreira Landfill Gas Project (EPLGP)” project in Brazil on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation.

The validation consisted of the following three phases: i) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

This validation report summarizes the findings of the validation. The only changes made to this version of the validation report compared to the validation report rev. 02 dated 23 January 2007 referred to in the letter of approval of the DNA of Brazil are linked to version of ACM0001, the starting date and the status of issuance of the letter of approval by the DNA of Brazil.

In summary, it is DNV's opinion that the “Estre Pedreira Landfill Gas Project (EPLGP)” as described in the revised PDD of 30 March 2007, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0001 (version 05). Hence, DNV will request the registration of the “Estre Pedreira Landfill Gas Project (EPLGP)” as a CDM project activity.

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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CETESB	State of São Paulo environmental agency
CDR	Center for the Management of Residues (<i>Centro de Disposição de Resíduos</i>)
CH ₄	Methane
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DAIA	Environmental Impacts Assessment Department (<i>Departamento de Avaliação de Impactos Ambientais</i>)
DNV	Det Norske Veritas
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N ₂ O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
SMA	State Secretary of Environmental Impacts (<i>Secretaria de Estado de Meio Ambiente</i>)
UNFCCC	United Nations Framework Convention on Climate Change



1 INTRODUCTION

CDR Pedreira – CENTRO DE DISPOSIÇÃO DE RESÍDUOS LTDA and Econergy Brasil Ltda have commissioned Det Norske Veritas Certification Ltd (DNV) to perform a validation of the “Estre Pedreira Landfill Gas Project (EPLGP)”, located in the district of Tremembé, São Paulo State, Brazil.

This report summarises the findings of the validation of the project, performed on the basis of UNFCCC and host Party criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting. This validation report summarizes the findings of the validation. The only changes made to this version of the validation report compared to the validation report rev. 02 dated 23 January 2007 referred to in the letter of approval of the DNA of Brazil are linked to version of ACM0001, the starting date and the status of issuance of the letter of approval by the DNA of Brazil

The validation team consisted of the following personnel:

Mr. Raphael de Souza Tavares	DNV Certification Rio de Janeiro	Team leader, CDM validator.
Mr. Luis Filipe Tavares	DNV Certification Rio de Janeiro	Waste sector expert.
Ms Shruthi Poonacha	DNV Certification India	GHG Auditor
Mr K.V.Raman	DNV Certification India	GHG Auditor
Mr. Michael Lehmann	DNV Certification, Oslo	Technical reviewer

1.1 Validation Objective

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

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the consolidated baseline and monitoring methodology ACM0001 (version 05). The validation team has, based on the recommendations in the Validation and Verification Manual /11/, and employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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



1.3 Description of Proposed CDM Project

The “Estre Pedreira Landfill Gas Project (EPLGP)” aims to capture and flare the landfill gas generated at the CDR Pedreira landfill in order to avoid emissions of methane to the atmosphere. The landfill is located in the district of Tremembé, São Paulo State, Brazil. The landfill started operations in October 2001 and 16.7 million tons of waste. The project is forecasted to start on 01 July 2007.

One of CDR Pedreira – CENTRO DE DISPOSIÇÃO DE RESÍDUOS LTDA’s shareholders is ESTRE (Empresa de Saneamento e Tratamento de Resíduos), a 100% Brazilian company, founded in 1999.

The current practice at the landfill is to collect and burn the gas only through a passive system, with no systematic and monitored flare. Methane is emitted to the atmosphere through the existing wells, and only part of the gas is burned due to safety and odour reasons.

The project involves the development of a collection pipeline network and a flaring system. The collection system will be built using the existing wells. The wells will be covered and connected to a main pipeline to transport the landfill gas to the flare. A blower will be installed in order to increase the amount of landfill gas collected.

The estimated amount of GHG emission reductions from the project is calculated to be 1 304 206 tonnes CO₂ equivalents (tCO₂e) during the first renewable 7-year crediting period (with the potential of being renewed twice), resulting in estimated average annual emission reductions of 186 315 tCO₂e.

2 METHODOLOGY

The validation consisted of the following three phases:

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

In order to ensure transparency, a validation protocol was customized for the project, according to the Validation and Verification Manual /11/. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the “Estre Pedreira Landfill Gas Project (EPLGP)” is enclosed in Appendix A to this report.

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



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

The term *clarification* (CL) may be used where additional information is needed to fully clarify an issue

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	Reference	Conclusion	Cross reference
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>

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

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

Figure 1 Validation protocol tables



2.1 Review of Documents

The PDD version 01 of 14 June 2006 /1/, the subsequent version 02 of 05 September 2006 /2/ and the final version 03 of 11 December 2006 /3/ submitted by CDR Pedreira – CENTRO DE DISPOSIÇÃO DE RESÍDUOS LTDA and Econergy Brasil Ltda were assessed by DNV. The only changes that have been done in the version 3 of the PDD were the project starting date, the crediting period starting date and the L0. In order to be more conservative, as the CDR Pedreira landfill receives different type of waste, a value of $L_0 = 60 \text{ m}^3\text{CH}_4/\text{tonwaste}$ to the ex-ante estimative was adopted. After that, the PDD version 4 dated 02 February 2007 applying the ACM0001 version 5 and PDD template version 3 was submitted, however the document don't mention the Tool of additionality. A final version 5 of PDD dated 30 March 2007 was submitted, the changes between version 3 and 5 were related to the adjustment of flaring efficiency.

Also, additional documents such as the grid emission factor calculations, emission reductions calculations /6//7/, environmental licences and the letters sent to local stakeholders, were assessed during the validation.

2.2 Follow-up Interviews

On July 2006, DNV performed interviews with a representative of Econergy Brasil Ltda in order to confirm and to resolve issues identified in the document review. This included, but was not limited to:

Table 1 Interview topics

Interviewed organisation	Interview topics
Econergy Brasil Ltda.	<ul style="list-style-type: none"> ➤ Management System <ul style="list-style-type: none"> ○ authority and responsibilities ○ training ○ maintenance ○ monitoring, measurement and calibration of monitoring equipment ○ emergency preparedness ○ records maintenance ○ internal audits ○ corrective actions
	➤ Environmental Licenses.
	➤ LFG Collection Efficiency
	➤ Consultation of local stakeholders.
	➤ Current practice of passive venting and unsystematic burning of LFG.

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design.

The initial validation of the project identified 2 (two) *corrective action requests* and 2 (two) requests for *clarification*. The project participant's response to DNV's draft validation report



findings and the final version of the PDD of 30 March 2007 addressed the *corrective action requests* and requests for *clarification* to DNV's satisfaction.

To guarantee the transparency of the validation process, the concerns raised and the response provided by the project participants are documented in more detail in the validation protocol in Appendix A.

2.4 Internal Quality Control

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

3 VALIDATION FINDINGS

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

The final validation findings relate to the project design as documented and described in the revised PDD of 30 March 2007.

3.1 Participation Requirements

The project participants are CDR Pedreira – CENTRO DE DISPOSIÇÃO DE RESÍDUOS LTDA and Econergy Brasil Ltda from Brazil. The host Party Brazil meets all relevant participation requirements and has provided written approval of voluntary participation in the project. No participating Annex I Party is yet identified.

3.2 Project Design

The objective of the Project is to capture and flare the landfill gas produced at the CDR Pedreira landfill site owned by the project proponent and located in São Paulo, Brazil. The project activity thereby avoids emissions of methane to the atmosphere.

A 7-year renewable crediting period is selected (with the potential of being renewed twice), starting on 01 July 2007. The starting date of the project activity is forecasted to be 01 July 2007 with an expected operational lifetime of 21 years.

The current practice at the landfill is to collect and burn the gas only through a passive system, with no systematic and monitored flare. Methane is emitted to the atmosphere through the existing wells, and only part of the gas is burned due to safety and odour reasons.

The project involves the development of a collection pipeline network and a flaring system. The collection system will be built using the existing wells. The wells will be covered and connected to a main pipeline to transport the landfill gas to the flare. A blower will be installed in order to increase the amount of landfill gas collected.



The project is expected to bring improvement on sustainable development through reducing methane emissions and minimizing the risk of explosions at the site. The project involves the transfer of technology, which has a positive impact on employment and construction capacity skills.

There is no public funding involved in the project, and the validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.

3.3 Baseline Determination

The project applies the approved baseline methodology ACM0001 (version 05) – “*Consolidated baseline methodology for landfill gas project activities*” /12/. This methodology is applicable to project activities that reduce greenhouse gas emissions through landfill gas capture and destruction of methane by flaring and/or generation of electricity. In the case of the “Estre Pedreira Landfill Gas Project (EPLGP)”, the destruction of methane will be done through flaring only.

The selected baseline scenario is the partial atmospheric release of the landfill gas. As “Estre Pedreira Landfill Gas Project (EPLGP)” does not have any contractual obligations to burn methane, the methane that would have been destructed in the baseline has been calculated using an “Adjustment Factor”. The “Adjustment Factor” is estimated to be 20% of total methane destroyed by flaring. The “Adjustment Factor” of 20% allows for the destruction of LFG in the baseline scenario which would have occurred as a result of the continuation of the current practice of passive venting and unsystematic burning of LFG and is deemed to be appropriate. Since the Brazilian landfill regulations do not mandate LFG collection and destruction and only a small amount of the methane generated is currently burned due to safety and odour reasons, an “Adjustment Factor” of 20% is deemed appropriate.

GHG emissions by sources in the baseline were estimated using IPCC’s guidelines and the first order decay model approach considering values of $L_0 = 60 \text{ m}^3\text{CH}_4/\text{tonwaste}$ and $k (1/\text{year}) = 0.1$. These figures are deemed appropriate and conservative.

3.4 Additionality

In accordance with ACM0001, the additionality of the project is demonstrated through the *Tool for the demonstration and assessment of additionality* /14/, which includes the following steps:

Step 0 -Preliminary screening based on the starting date of the project activity: As the starting date of the crediting period (01 July 2007) for the project is after to the expected date of registration, this step is not applicable.

Step 1 - Identification of alternatives to the project activity consistent with current laws and regulations: The possible baseline scenarios are: a) LFG would continue to be released to the atmosphere and only small amounts of LFG would be burned due to safety and odour reasons and b) the implementation of capturing and flaring of LFG without CDM incentives. There is no legislation in Brazil obliging landfills to flare the collected gas. Hence, both scenarios are in compliance with all applicable legal and regulatory requirements. Since the project activity does not have any other incentives from the capturing and flaring of the methane, the current scenario of continued release of methane to the atmosphere with partial flaring due to safety reasons has



been selected as the baseline and this baseline scenario is further justified through the next steps of the additionality tool.

Step 2 - Investment analysis: As the CDM project activity does not generate any financial or economic benefit other than the CDM related income, the simple cost analysis scenario is applied. Considering the additional costs necessary for increasing the LFG capture capacity, without having any revenues, the project is not a likely baseline scenario. Even if LFG was utilised to generate electricity, this would not significantly alleviate the economic and financial hurdles of the project.

Step 3 - Barrier analysis: Not selected (Step 2 is selected only).

Step 4 - Common practice analysis: DNV was able to confirm that possible future legislation that would require landfills to quantify and flare a certain amount of the gas produced is not likely to be implemented in near future, considering the waste disposition situation in Brazil. At present 53% of waste produced in Southeast of Brazil is disposed in dumps and only about 13% is destined to sanitary landfill. A major environmental problem related to domestic waste in Brazil is the lack of waste disposal to sanitary landfills. DNV was able to confirm that the investment to install systems to capture and flare methane is not common practice in Brazil.

Step 5 - Impact of CDM registration: As there is no income from the project, the sale of CERs will present the only revenue for the project and will significantly alleviate the economic and financial hurdles of the project.

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

3.5 Monitoring Plan

The project correctly applies the approved monitoring methodology ACM0001 (version 05) - “Consolidated monitoring methodology for landfill gas projects activities” /12/

The following parameters will be monitored as per the monitoring plan:

- Amount of landfill gas captured;
- Amount of landfill gas sent to the flare;
- Flare efficiency;
- Methane fraction in the landfill gas;
- Temperature and pressure of the landfill gas;
- Electricity requirement of the project;
- Regulatory requirement changes.

The quality control and quality assurance datasheet for the project identifies several monitoring routines. As the project is not yet implemented, the responsibilities for project operation and monitoring and reporting have not yet been developed. However, by the time of the project implementation, a team and its responsibilities will be assigned. The management systems are to be assessed during the first verification.

All the data will be archived for a period of two years after the crediting period.



3.6 Calculation of GHG Emissions

Emission reductions are directly monitored and calculated *ex-post*, using the approach indicated in ACM0001 (version 05). An adjustment factor of 20% for destruction of landfill gas in the baseline scenario will be applied during the first renewable 7-year crediting period.

For the *ex-ante* estimation of emission reductions the projected LFG generation from the landfill was determined using the IPCC first order decay model. A methane potential generation (L_0) of $60 \text{ m}^3\text{CH}_4/\text{ton waste}$, a decay constant k (1/year) of 0.1 and a collection efficiency of 65% were assumed.

For the calculation of project emissions due to the import of electricity used to pump the LFG, the Brazilian South-Southeast-Midwest interconnected grid CO_2 emission coefficient has been calculated and fixed *ex-ante* for the first 7-year crediting period and is calculated to be $0.2611 \text{ tCO}_2\text{e/MWh}$ (weighted average of the build margin (BM) and operating margin (OM) emission coefficients). The calculation conform to the procedure given in ACM0002 (version 6) and the calculations were based on electricity generation data provided by National Electricity System Operator (ONS) for the electricity generated in the South-Southeast-Midwest (S-SE-CO) grid in the years 2003-2005. Data for the years 2003-2005 are the most recent statistics available at the time of the PDD submission.

The project activity is projected to reduce $186\,315 \text{ tCO}_2$ yearly. Considering the amount of uncertainty related to the methane generation and collection efficiency, which depends on the actual design and engineering of the project, this might be achievable if the project is implemented suitably. However, experiences with other landfills have shown that the methane generation and collection efficiency of the landfills projected by the first order decay model has an inherent uncertainty of almost 50% and hence the amount of CERs, which will be monitored *ex-post*, might vary from the projected amount.

3.7 Environmental Impacts

The CDR Pedreira landfill has been granted the Partial Operational Licence # 29002236 on 06 September 2005, which is valid until 06 September 2010. This license was issued by the State of São Paulo environmental agency (CETESB) /9/

The landfill gas capture and flaring project has not yet obtained a licence for flaring, and such a licence must be applied for. Given that the flaring of landfill gas has little adverse environmental impacts, it is likely that the licence will be obtained when the project is implemented. At the first periodic verification of the project's emission reductions, it must be confirmed that this licence was eventually obtained.

3.8 Comments by Local Stakeholders

Local stakeholders, such as the Municipal Government, the state and municipal agencies, the Brazilian forum of NGOs, neighbouring communities and the office of the attorney general, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. Copies of the letters sent to the local stakeholders were verified during the follow up interviews /8/. One comment was received from the "Secretaria de Estado do Meio Ambiente-São Paulo".



It is DNV's opinion that the comment received was sufficiently taken into account by CDR Pedreira – CENTRO DE DISPOSIÇÃO DE RESÍDUOS LTDA and ESTRE. The comment received and ESTRE's response is transparently documented in section G of the latest version of the PDD.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

DNV Certification published the PDD of 02 February 2007 on the DNV Climate Change web site (<http://www.dnv.com/certification/ClimateChange>) and Parties, stakeholders and NGOs are, through the UNFCCC CDM web site, invited to provide comments during the period from 03 March 2007 to 01 April 2007. No comments were received

Prior to this, the PDD of 14 June 2006 was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 20 June 2006 to 19 July 2006. No comments were received.



5 VALIDATION OPINION

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “Estre Pedreira Landfill Gas Project (EPLGP)”, located in the district of Tremembé, São Paulo State, Brazil. The validation was performed on the basis of UNFCCC criteria for CDM project activities and relevant Brazilian criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The project participants are CDR Pedreira – CENTRO DE DISPOSIÇÃO DE RESÍDUOS LTDA and Econergy Brasil Ltda of Brazil. The host Party Brazil meets all relevant participation requirements and has provided written approval of voluntary participation in the project. No participating Annex I Party is yet identified.

The project’s objective is to capture and flare the landfill gas produced at the “Centro de Disposição de Resíduos” - CDR Pedreira landfill, to avoid emissions of methane to the atmosphere. The technology to be employed will be the improvement of landfill gas collection and flaring, through the installation of an active recovery system composed of a collection and transportation pipeline network and a flaring system.

The project applies the approved baseline and monitoring methodology ACM0001 (version 05), i.e. “Consolidated baseline and monitoring methodology for landfill gas project activities”. The baseline methodology has been correctly applied and the assumptions made for the selected baseline scenario are sound. It is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions attributable to the project are additional to any that would occur in the absence of the project activity.

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

By burning the methane contained in landfill gas the project results in reductions of CH₄ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. Emission reductions are directly monitored and calculated ex-post, using the approach indicated in ACM0001. The ex-ante estimation of emission reductions and the projected LFG generation from the landfill was determined using the IPCC first order decay model.

Local stakeholders, such as the Municipal Government, the state and municipal agencies, the Brazilian forum of NGOs, neighbouring communities and the office of the attorney general, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. One comment was received and has been taken into account during DNV’s validation. Parties, stakeholders and NGOs were invited to comment on the validation requirements via the UNFCCC web-site. No comments were received.

In summary, it is DNV’s opinion that the “Estre Pedreira Landfill Gas Project (EPLGP)”, as described in the revised and resubmitted project design document of 30 March 2007, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0001 (version 05). Hence, DNV will request the registration of the “Estre Pedreira Landfill Gas Project (EPLGP)” as a CDM project activity.



REFERENCES

Documents provided by the project proponent that relate directly to the project:

- /1/ Econergy Brasil Ltda: *Project Design Document for the “Estre Pedreira Landfill Gas Project (EPLGP)”*, Version 1 of 14 June 2006.
- /2/ Econergy Brasil Ltda: *Project Design Document for the “Estre Pedreira Landfill Gas Project (EPLGP)”*, Version 2 of 05 September 2006
- /3/ Econergy Brasil Ltda: *Project Design Document for the “Estre Pedreira Landfill Gas Project (EPLGP)”*, Version 3 of 11 December 2006.
- /4/ Econergy Brasil Ltda: *Project Design Document for the “Estre Pedreira Landfill Gas Project (EPLGP)”*, Version 4 of 02 February 2007.
- /5/ Econergy Brasil Ltda: *Project Design Document for the “Estre Pedreira Landfill Gas Project (EPLGP)”*, Version 5 of 30 March 2007.
- /6/ Econergy Brasil Ltda: *Spreadsheets for the calculation of the CDR Pedreira Baseline.*
- /7/ *Spreadsheets for the calculation of the combined margin emission Coefficient (BR SSECO 2003-2005-2006.08.28.xls).*
- /8/ Letters sent to local stakeholders and the comment received.
- /9/ CDR Pedreira- Partial Operational Licence # 29002236 on 06 September 2005, which is valid until 06 September 2010
- /10/ Comissão Interministerial de Mudança Global do Clima (DNA of Brazil): *Letter of Approval: 25 January 2007*

Background documents related to the design and/or methodologies employed in the design or other reference documents:

- /11/ International Emission Trading Association (IETA) & the World Bank’s Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /12/ CDM Executive Board: *Approved Baseline and Monitoring Methodology ACM0001: “Consolidated baseline methodology for landfill gas project activities”*, version 05.
- /13/ CDM Executive Board: *Approved Baseline and Monitoring Methodology ACM0002: “Consolidated methodology for grid-connected electricity generation from renewable sources”*, version 6.
- /14/ CDM Executive Board: *Tool for the demonstration and assessment of additionality*. Version 02.
- /15/ CDM Executive Board: *“Methodological Tool to determine project emissions from flaring gases containing methane”*. Version 01.



Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:

/16/ Eduardo Cardoso Filho - Econergy

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APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	OK	Table 2, Section E.4.1 No participating Annex I Party is yet identified.
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK	DNA of Brazil: Letter of Approval. 25 January 2007
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK	Table 2, Section B.2
7. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK	The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	The Brazilian designated national authority for the CDM is the Comissão Interministerial de

Requirement	Reference	Conclusion	Cross Reference / Comment
			Mudança Global do Clima.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	Brazil has ratified the Kyoto Protocol on 23 August 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	Not applicable.	No participating Annex I Party is yet identified. The project is a unilateral project.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	Not applicable.	No participating Annex I Party is yet identified. The project is a unilateral project.
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	CDM Modalities and Procedures §37b	OK	Table 2, Section G
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK	Table 2, Section F
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities and Procedures §37f	OK	Table 2, Section D
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	CDM Modalities and Procedures §40	OK	The PDD was presented for public comments in the period of 20 June 2006 to 19 July 2006 on climatechange.dnv.com and comments were invited via the UNFCCC CDM website. No comments were received.
17. A baseline shall be established on a project-specific basis, in	CDM Modalities and	OK	Table 2, Section B.2

Requirement	Reference	Conclusion	Cross Reference / Comment
a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Procedures §45c,d		
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	CDM Modalities and Procedures §47	OK	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	PDD is in accordance with CDM-PDD (version 02 of 1 July 2004).

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A. General Description of Project Activity <i>The project design is assessed.</i>					
A.1. Project Boundaries <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	The “Estre Pedreira Landfill Gas Project (EPLGP)” is located in the district of Tremembé, São Paulo State, Brazil.		OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	<p>The project's system boundary comprises the CDR Pedreira landfill and complementary facilities to collect, pump and flare the LFG.</p> <p>It is indicated that the project proponent will install wellheads at the existing concrete wells. The wellheads will be connected to a manifold. All the individual manifolds will be connected to the main transmission pipeline going to the flare system through a blower and a dewatering system. The system for the removal of leachate and its treatment prior to discharge will be as per the regulations specified in the operating licence.</p>		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
A.2. Technology to be employed <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR	The CDR Pedreira landfill gas collection system and transmission pipelines are all standard engineering available in Brazil. The flare system technology and flare equipment will be imported. It can be concluded that the project design engineering reflects current good practice.		OK
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR	The common practice in Brazil is sanitary landfills without landfill gas treatment or only safety flaring. The project uses standard technology available. The flare system which is the most critical part of the system is imported.		OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	The project is unlikely to be substituted by other more efficient technologies.		OK
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/	DR	Yes, since landfill gas capture and flaring projects are not very common in Brazil, the project will require extensive initial training and maintenance effort to work as presumed during the project period.		OK
A.2.5. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	The project activity will be implemented by engineers and specialists with experience in implementing landfill gas capture and flaring projects. These professionals will train the		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			local operators and engineers on the operations and training aspects.		
A.3. Contribution to Sustainable Development <i>The project's contribution to sustainable development is assessed.</i>					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/	DR	<p>The CDR Pedreira landfill has been granted an Operational Environmental Licence from both the State Secretary of Environment (Secretaria do Estado do Meio Ambiente – SMA) and the state of São Paulo environmental agency (Companhia de Tecnologia de Saneamento Ambiental – CETESB).</p> <p>License details:</p> <ul style="list-style-type: none"> • Operational Licence No 29002236 • Issued on 6th Sept 2005 • valid until 6th Sept 2010 <p>The landfill gas capture and flaring project has not yet obtained a licence for flaring, and such a licence must be applied for. Given that the flaring of landfill gas has little adverse environmental impacts, it is likely that the licence will be obtained when the project is implemented. At the first periodic verification of the project's emission reductions, it must be confirmed that this licence was eventually obtained.</p>		OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR	The project is in line with host country specific requirements.		OK
A.3.3. Is the project in line with sustainable	/1/	DR	The project is in line with current		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
development policies of the host country?			sustainable development priorities in Brazil. The DNA of Brazil confirmed that the project assists in achieving sustainable development.		
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project is expected to bring improvement on sustainable development through reducing methane emissions and minimizing the risk of explosions at the site. The project involves the transfer of technology, which has a positive impact on employment and construction capacity skills.		OK
B. Project Baseline <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
B.1. Baseline Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/1/	DR	The project applies the approved baseline methodology ACM0001 - “Consolidated baseline methodology for landfill gas project activities” which is previously approved by the CDM Executive Board.		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	The baseline methodology is applicable to the project activity as the project envisages the capture and flaring of the landfill gas and the baseline scenario is the partial or total release of the landfill gas to the		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			atmosphere.		
B.2. Baseline Determination <i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i>					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/	DR	The application of the methodology is correct and the baseline determination is transparent. The baseline is that in the absence of the project activity the landfill gas would be released to the atmosphere, except of a small quantity which is captured and burnt to address safety and odour concerns.		OK
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	<p>As the landfill does not have any contractual obligations to burn methane, the baseline emissions are calculated based on the “Adjustment Factor”, estimated as 20% of total methane destroyed at the baseline. A collection efficiency value of 75% was considered. As the project does not have any contractual obligations to burn methane, this value is a conservative approach.</p> <p>The CERs have been estimated using an LFG collection efficiency of 75% which is on the higher side and not conservative and needs to be addressed to. The flare efficiency assumed is also not clear and needs to be addressed to in the CER</p>	CL-1	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			estimation. It is also to be confirmed that the project activity will receive the quantity of waste as specified in the emission reduction calculation spreadsheet		
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	The baseline has been specifically designed for this project.		OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	The National Waste Management Policy is under discussions and there is enough evidence to conclude that it will result only in requirements for LFG collection but no requirements for LFG destruction of more than 20% of the LFG produced. Currently there are no laws or policies that obligate burning the LFG.		OK
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR	Yes.		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR	The selected baseline represents the most likely scenario. The common practice in large cities of Brazil is to dispose waste in sanitary landfills. In the smaller cities the practice is open dumping. All of these scenarios don't have any facilities to collect and flare the landfill gas that is generated. Only a minimum quantity of landfill gas is flared for safety conditions.		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/	DR	In accordance with ACM0001, the additionality of the project is demonstrated through the <i>Tool for the demonstration and assessment of additionality</i> /14/, which includes the following steps:		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p><i>Step 0 -Preliminary screening based on the starting date of the project activity:</i> As the starting date of the crediting period (01 July 2007) for the project is after to the expected date of registration, this step is not applicable.</p> <p><i>Step 1 - Identification of alternatives to the project activity consistent with current laws and regulations:</i> The possible baseline scenarios are: a) LFG would continue to be released to the atmosphere and only small amounts of LFG would be burned due to safety and odour reasons and b) the implementation of capturing and flaring of LFG without CDM incentives. There is no legislation in Brazil obliging landfills to flare the collected gas. Hence, both scenarios are in compliance with all applicable legal and regulatory requirements. .Since the project activity does not have any other incentives from the capturing and flaring of the methane, the current scenario of continued release of methane to the atmosphere with partial flaring due to safety reasons has been selected as the baseline and this baseline scenario is further justified through the next steps of the additionality tool.</p> <p><i>Step 2 - Investment analysis:</i> As the CDM project activity does not generate any financial or economic benefit other than the CDM related income, the simple cost</p>		

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>analysis scenario is applied. Considering the additional costs necessary for increasing the LFG capture capacity, without having any revenues, the project is not a likely baseline scenario. Even if LFG was utilised to generate electricity, this would not significantly alleviate the economic and financial hurdles of the project.</p> <p><i>Step 3 - Barrier analysis:</i> Not selected (Step 2 is selected only).</p> <p><i>Step 4 - Common practice analysis:</i> DNV was able to confirm that possible future legislation that would require landfills to quantify and flare a certain amount of the gas produced is not likely to be implemented in near future, considering the waste disposition situation in Brazil. At present 53% of waste produced in Southeast of Brazil is disposed in dumps and only about 13% is destined to sanitary landfill. A major environmental problem related to domestic waste in Brazil is the lack of waste disposal to sanitary landfills. DNV was able to confirm that the investment to install systems to capture and flare methane is not common practice in Brazil.</p> <p><i>Step 5 - - Impact of CDM registration:</i> As there is no income from the project, the sale of CERs will present the only revenue for the project and will significantly alleviate the</p>		

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			economic and financial hurdles of the project. Given the above, it is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions are thus additional.		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	The project considers an EAF of 20% and collection efficiency of 75%. The CERs have been estimated using an LFG collection efficiency of 75% which is on the higher side and not conservative and needs to be addressed to. The flare efficiency assumed is also not clear and needs to be addressed to in the CER estimation. It is also to be confirmed that the project activity will receive the quantity of waste as specified in the emission reduction calculation spreadsheet	CL-4	OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Yes.		OK
C. Duration of the Project/ Crediting Period <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/	DR	The project is foreseen to start on 01 July 2007 and the project's expected operational lifetime is 21 years and deemed reasonable.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	A renewable 7-year crediting period (with the potential of being renewed twice) is selected, with a forecasted starting date of 01 July 2007.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D. Monitoring Plan <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i>					
D.1. Monitoring Methodology <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/	DR	The project applies the approved baseline methodology ACM0001 - Consolidated monitoring methodology for landfill gas project activities		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/	DR	<p>The monitoring methodology is applicable for the project as the project is a landfill gas (LFG) capture and flaring project. In line with the methodology the following parameters will be monitored.</p> <ul style="list-style-type: none"> - Volume of LFG captured - measured - Volume of LFG flared - measured - Flare efficiency - measured - Methane fraction in LFG being flared- analysed - Temperature of LFG – measured - Pressure of LFG – measured - Electricity consumption – measured - Hours of blower operation – measured 		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			- Regulatory requirements		
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR	The discussion and selection of the monitoring methodology is as per the approved methodology and transparent.		OK
D.1.4. Is the discussion and selection of the monitoring methodology transparent?	/1/	DR	Yes		OK
D.2. Monitoring of Project Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	<p>Yes, in line with the methodology, the monitoring plan provides for the collection and archiving of all necessary data.</p> <p>The Adjustment factor has been selected at 20% and needs to be justified.</p> <p>The grid emission factor has been estimated at 0.2647 considering the South-Southeast-Midwest grid. The factor is estimated as per the guidelines of the ACM0002. The Operating margin was calculated using the simple adjusted OM, with the vintage data of 2002 to 2004 from the Brazilian Electricity System Manager (ONS). The build margin BM has been calculated using the 20% of the total generation of the year 2005 as the generation of the 5 most recent plants is less than the 20%.</p> <p>With the availability of the data for the year 2005, the grid emission factor is to be updated.</p>	CAR 1	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	The choice of project GHG indicator CO ₂ is reasonable.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	Yes. The CH ₄ fraction in the landfill gas is stated to be monitored “continuously (quarterly, monthly if unstable)”.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	Yes.		OK
D.2.5. Will the indicators enable comparison of project data and performance over time?	/1/	DR	Yes		OK
D.3. Monitoring of Leakage <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	No potential emission sources of leakage are to be considered as per ACM0001.		OK
D.3.2. Are the choices of leakage indicators reasonable?	/1/	DR	See D.3.1.		OK
D.3.3. Will it be possible to monitor / measure the specified leakage indicators?	/1/	DR	See D.3.1.		OK
D.3.4. Will the indicators give opportunity for real measurements of leakage effects?	/1/	DR	See D.3.1.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.4. Monitoring of Baseline Emissions <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	The baseline emissions of GHG have been estimated <i>ex-ante</i> following the IPCC guidelines and the first order decay model.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	The choice of CH ₄ as the baseline indicator is reasonable.		OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	Yes		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	Yes		OK
D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	ACM0001 and the Brazilian DNA do not require the monitoring of social or environmental indicators.		OK
D.5.2. Is the choice of indicators for sustainability development (social, environmental, economic) reasonable?	/1/	DR	See D.5.1		OK
D.5.3. Will it be possible to monitor the specified sustainable development indicators?	/1/	DR	See D.5.1		OK
D.5.4. Are the sustainable development indicators in line with stated national priorities in the Host	/1/	DR	See D.5.1		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
Country?					
D.6. Project Management Planning <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR	<p>Although the PDD mentions a team assigned to monitor emission reductions, no management structure has been evidenced. The responsibility and authority for the project management has to be described and no management structure has been evidenced.</p> <p>The following procedures need to be established:</p> <ul style="list-style-type: none"> • training of monitoring personnel • emergency preparedness • calibration of monitoring equipment • maintenance of monitoring equipment and installations • monitoring, measurements and reporting • day-to-day records handling • monitoring data adjustments and uncertainties • review of reported results/data • internal audits of GHG project compliance with operational requirements where applicable • project performance reviews before 	CAR-2	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			data is submitted for verification, internally or externally corrective actions in order to provide for more accurate future monitoring and reporting.		
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	See D.6.1	CAR-2	OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR	It is not clear from the PDD, if procedures have been established for the training of monitoring personnel. The local operating and maintenance staff will be trained by the expert engineers and specialist who will be implementing the project. However the CDR Pedreira landfill gas project has an Environmental Management System in place and training procedures would have been incorporated in these.	CAR-2	OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	Same as D.6.3.	CAR-2	OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	The table D.3 on the QA and QC indicates that monitoring equipment will be subjected to regular maintenance and testing to ensure accuracy.	CAR-2	OK
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	Same as D.6.3.	CAR-2	OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	The monitoring plan provided in the PDD mentions the system for the monitoring, measurement and reporting.		OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep,	/1/	DR	Same as D.6.3	CAR-2	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
storage area of records and how to process performance documentation)					
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	Same as D.6.3	CAR-2	OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR	Same as D.6.3	CAR-2	OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	Same as D.6.3.	CAR-2	OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR	Same as D.6.3.	CAR-2	OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	Same as D.6.3.	CAR-2	OK
E. Calculation of GHG Emissions by Source <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					
E.1. Project GHG Emissions <i>The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR	Yes, all aspects related to direct GHG emissions have been captured in the project design. The direct project emissions result		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			from the electricity consumption of the blower. There are no indirect emissions from the project.		
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes, the calculations are documented in a transparent manner.		OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR	Yes, conservative assumptions have been used to estimate the project GHG emissions. With the availability of the data for the year 2005, the grid emission factor is to be updated.	CAR 1	OK
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	/1/	DR	Yes.	CAR 1	OK
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	Yes		OK
E.2. Leakage <i>It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.</i>					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/	DR	No potential emission sources of leakage were established by ACM0001.		OK
E.2.2. Have these leakage effects been properly accounted for in calculations?	/1/	DR	See E.2.1		OK
E.2.3. Does the methodology for calculating leakage comply with existing good practice?	/1/	DR	See E.2.1		OK
E.2.4. Are the calculations documented in a complete	/1/	DR	See E.2.1		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
and transparent manner?					
E.2.5. Have conservative assumptions been used when calculating leakage?	/1/	DR	See E.2.1		OK
E.2.6. Are uncertainties in the leakage estimates properly addressed?	/1/	DR	See E.2.1		OK
E.3. Baseline Emissions <i>The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR	<p>The baseline GHG emissions have been estimated <i>ex-ante</i> following the IPCC guidelines and the first order decay model. In line with the guidelines, the following constants were assumed.</p> <ul style="list-style-type: none"> - k - decay constant – 0.15 (1/year) - L_o - methane generation potential – 0.07 m³ methane/ Kg waste - F - fraction of methane in landfill gas - Collection efficiency – 75 %. <p>The CERs have been estimated using an LFG collection efficiency of 75% which is on the higher side and not conservative and needs to be addressed to. The flare efficiency assumed is also not clear and needs to be addressed to in the CER estimation.</p> <p>It is also to be confirmed that the project activity will receive the quantity of waste as specified in the emission reduction</p>	CL-1	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			calculation spreadsheet		
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	Yes		OK
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes, the GHG calculations have been documented in a complete and transparent manner.		OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	Yes		OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	Yes.		OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/	DR	Yes		OK
E.4. Emission Reductions					
<i>Validation of ex-ante estimated emission reductions.</i>					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	The estimated amount of GHG emission reductions from the project is expected to be 1 304 206 tCO ₂ e during the first renewable 7-year crediting period, resulting in estimated average annual emission reductions of 186 315 tCO ₂ e.		OK
F. Environmental Impacts					
<i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1. Has an analysis of the environmental impacts of	/1/		The CDR Pedreira landfill has been granted	CL-2	OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
the project activity been sufficiently described?			<p>an Operational Licence No 29002236 issued on 6th Sept 2005 that is valid until 6th Sept 2010. The license was issued after the Environmental Impact Assessment for the landfill was evaluated by the CETESB – São Paulo environmental agency.</p> <p>The analysis of the environmental impacts for the flaring project is to be analysed by the State of Sao Paulo Environmental Agency (CETESB).</p> <p>The environmental impact assessment report from Sao Paulo for the project activity needs to be submitted. The results of the EIA are to be included in the PDD.</p> <p>The landfill gas capture and flaring project has not yet obtained a licence for flaring, and such a licence must be applied for. Given that the flaring of landfill gas has little adverse environmental impacts, it is likely that the licence will be obtained when the project is implemented. At the first periodic verification of the project's emission reductions, it must be confirmed that this licence was eventually obtained.</p> <p>The environmental impact assessment report from São Paulo for the project activity has to be submitted. The results of the EIA are to be included in the PDD.</p>		
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	See F.1.1.	CL-2	OK
F.1.3. Will the project create any adverse	/1/	DR	Since the project involves the capture and		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
environmental effects?			flaring of landfill gas, there will be no adverse environmental effects. Leachate from the landfill is to be treated according to the specifications of the Brazilian laws and regulations before discharge.		
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	Since the project is only a LFG capture and flaring project, no transboundary environmental impacts are foreseen.	CL-2	OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	See F.1.1.	CL-2	OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	See F.1.1.	CL-2	OK
G. Stakeholder Comments <i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR	<p>Local stakeholders, such as the Municipal Government, the state and municipal agencies, the Brazilian forum of NGOs, neighbouring communities and the office of the attorney general, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. Copies of the letters sent to the local stakeholders were verified during the follow up interviews. One comment was received from the “Secretaria de Estado do Meio Ambiente-São Paulo”.</p> <p>It is DNV's opinion that the comment received was sufficiently taken into account</p>		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			by CDR Pedreira – CENTRO DE DISPOSIÇÃO DE RESÍDUOS LTDA and ESTRE. The comment received and ESTRE's response is transparently documented in section G of the latest version of the PDD.		
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Yes.		OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	See G.1.1.		OK
G.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	See G.1.1.		OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	See G.1.1.		OK

* MoV = Means of Verification, DR= Document Review, I= Interview

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<p>CAR 1</p> <p>With the availability of the data for the year 2005, the grid emission factor is to be updated.</p>	<p>D.2.1</p> <p>E.1.3</p> <p>E.1.4</p>	<p>The PDD v2 was updated using the most recent statistics from ONS and ANEEL.</p>	<p>The PDD has been revised as requested.</p> <p>The CAR is closed.</p>
<p>CAR 2</p> <p>The responsibility and authority for the project management has to be described and no management structure has been evidenced. The following procedures need to be established:</p> <ul style="list-style-type: none"> • training of monitoring personnel • emergency preparedness • calibration of monitoring equipment • maintenance of monitoring equipment and installations • monitoring, measurements and reporting • day-to-day records handling • monitoring data adjustments and uncertainties • review of reported results/data • internal audits of GHG project compliance with operational requirements where applicable • project performance reviews before data is submitted for verification, internally or externally <p>corrective actions in order to provide for more</p>	<p>D.6.1to</p> <p>D.6.13</p>	<p>As the project has not been implemented, no management structure and no procedures were identified. By the time of the project's implementation, all structures, authorities and procedures will be described and available to the Verification Team.</p>	<p>This information should be presented during the first verification in order to assure the project additionality.</p> <p>This CAR is therefore closed.</p>

* MoV = Means of Verification, DR= Document Review, I= Interview

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
accurate future monitoring and reporting.			
<p>CL 1</p> <p>The CERs have been estimated using an LFG collection efficiency of 75% which is on the higher side and not conservative and needs to be addressed to. The flare efficiency assumed is also not clear and needs to be addressed to in the CER estimation.</p> <p>It is also to be confirmed that the project activity will receive the quantity of waste as specified in the emission reduction calculation spreadsheet.</p>	<p>B.2.2</p> <p>B.2.8</p> <p>E.3.1</p>	<p>A document from USEPA presents a conservative value of collection efficiency of 80%. The source was sent to the validation team. However, the PDD v2 has been corrected to reflect 65% collection efficiency.</p> <p>CDR Pedreira landfill has all available contracts with companies located in the Metropolitan Region of São Paulo</p>	<p>A more conservative collection factor was used on estimative of emission reduction. This value is being used in calculation of the first crediting period in the revised PDD of 30 March 2007. The differences of the amount of waste received could be considered as an inherent uncertainty. As the amount of CER's will be calculated ex-post, this information could be not relevant.</p> <p>This CL is therefore closed.</p>
<p>CL 2</p> <p>The environmental impact assessment report from São Paulo for the project activity has to be submitted. The results of the EIA are to be included in the PDD.</p>	<p>F.1.1 to F.1.6</p>	<p>The Environmental Licences and the EIA from the landfill were submitted to the validation team.</p> <p>The conclusion of the EIA was added to PDD v2 page 25.</p>	<p>Complementary information that was included in the revised PDD of 30 March 2007, clarify this question.</p> <p>This CL is therefore closed.</p>

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APPENDIX B

CERTIFICATES OF COMPETENCE



CERTIFICATE OF COMPETENCE

Michael Lehmann

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

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	Yes
CDM Verifier:	Yes	JI Verifier:	Yes
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1,2,3 & 9		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	AM0021	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	AM0023	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	AM0024	Yes
ACM0004	Yes	AM0027	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	AM0028, AM0034	Yes
ACM0007	Yes	AM0030	Yes
ACM0008	Yes	AM0031	Yes
ACM0009, AM0008, AMS-III.B	Yes	AM0032	Yes
AM0006, AM0016, AMS-III.D	Yes	AM0035	Yes
AM0009, AM0037	Yes	AM0038	Yes
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	Yes	AM0041	Yes
AM0014	Yes	AM0034	Yes
AM0017	Yes	AMS-II.A-F	Yes
AM0018	Yes	AMS-III.A	Yes
AM0020	Yes	AMS-III.E, AMS-III.F	Yes

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Raphael de Souza Tavares

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

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	No
CDM Verifier:	Yes	JI Verifier:	No
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	No	AM0021	No
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	No	AM0023	No
ACM003, ACM0005, AM0033, AM0040	No	AM0024	No
ACM0004	No	AM0027	No
ACM0006, AM0007, AM0015, AM0036, AM0042	No	AM0028, AM0034	No
ACM0007	No	AM0030	No
ACM0008	No	AM0031	No
ACM0009, AM0008, AMS-III.B	No	AM0032	No
AM0006, AM0016, AMS-III.D	No	AM0035	No
AM0009, AM0037	No	AM0038	No
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	No	AM0041	No
AM0014	No	AM0034	No
AM0017	No	AMS-II.A-F	No
AM0018	No	AMS-III.A	No
AM0020	No	AMS-III.E, AMS-III.F	No

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Shruthi Poonacha

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

GHG Auditor:	Yes		
CDM Validator:	--	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	No	AM0021	No
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	No	AM0023	No
ACM003, ACM0005, AM0033, AM0040	No	AM0024	No
ACM0004	No	AM0027	No
ACM0006, AM0007, AM0015, AM0036, AM0042	No	AM0028, AM0034	No
ACM0007	No	AM0030	No
ACM0008	No	AM0031	No
ACM0009, AM0008, AMS-III.B	No	AM0032	No
AM0006, AM0016, AMS-III.D	No	AM0035	No
AM0009, AM0037	No	AM0038	No
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	No	AM0041	No
AM0014	No	AM0034	No
AM0017	No	AMS-II.A-F	No
AM0018	No	AMS-III.A	No
AM0020	No	AMS-III.E, AMS-III.F	No

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Raman Venkata Kakaraparthi

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

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	--
CDM Verifier:	--	JI Verifier:	--
Industry Sector Expert for Sectoral Scope(s):	--		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	No	AM0021	No
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	No	AM0023	No
ACM003, ACM0005, AM0033, AM0040	No	AM0024	No
ACM0004	No	AM0027	No
ACM0006, AM0007, AM0015, AM0036, AM0042	No	AM0028, AM0034	No
ACM0007	No	AM0030	No
ACM0008	No	AM0031	No
ACM0009, AM0008, AMS-III.B	No	AM0032	No
AM0006, AM0016, AMS-III.D	No	AM0035	No
AM0009, AM0037	No	AM0038	No
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	No	AM0041	No
AM0014	No	AM0034	No
AM0017	No	AMS-II.A-F	No
AM0018	No	AMS-III.A	No
AM0020	No	AMS-III.E, AMS-III.F	No

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director



CERTIFICATE OF COMPETENCE

Luis Filipe Tavares

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

GHG Auditor:	Yes		
CDM Validator:	Yes	JI Validator:	No
CDM Verifier:	Yes	JI Verifier:	No
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 13		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	No	AM0021	No
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	No	AM0023	No
ACM003, ACM0005, AM0033, AM0040	No	AM0024	No
ACM0004	No	AM0027	No
ACM0006, AM0007, AM0015, AM0036, AM0042	No	AM0028, AM0034	No
ACM0007	No	AM0030	No
ACM0008	No	AM0031	No
ACM0009, AM0008, AMS-III.B	No	AM0032	No
AM0006, AM0016, AMS-III.D	No	AM0035	No
AM0009, AM0037	No	AM0038	No
AM0013, AM0022, AM0025, AM00379, AMS-III.H, AMS-III.I	No	AM0041	No
AM0014	No	AM0034	No
AM0017	No	AMS-II.A-F	No
AM0018	No	AMS-III.A	No
AM0020	No	AMS-III.E, AMS-III.F	No

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director