



VALIDATION REPORT

ECOSECURITIES INTERNATIONAL LIMITED

VALIDATION OF THE JOBURG LANDFILL GAS TO ENERGY PROJECT

BUREAU VERITAS CERTIFICATION

62/71 Boulevard du Château
92571 Neuilly Sur Seine Cdx - France

REPORT No. KENYA-VAL/06/2011
REVISION No. 04.2

VALIDATION REPORT

Date of first issue: 01/09/2011	Organizational unit: Bureau Veritas Certification Holding SAS
Client: EcoSecurities International Limited	Client ref.: Mr. Browne Patrick

Summary:

Bureau Veritas Certification has made the validation of the Joburg Landfill Gas to Energy Project of EcoSecurities International Limited located on 40 Dawson Street, Dublin, Ireland, 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 rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consists of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final validation report and opinion. The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the validation process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology ACM0001 Version 11, "Consolidated baseline and monitoring methodology for landfill gas project activities" adopted at EB47, and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria.

Report No.: KENYA-val/06/2011	Subject Group: CDM
Project title: Joburg Landfill Gas to Energy Project	
Work carried out by: DR. ASHOK MAMMEN – TEAM LEADER ANDREW KINYANJUI – TEAM MEMBER JANENE JANSEN – TRAINEE MEMBER YURI MATVEEV – SECTOR SPECIALIST BERNARDO ALEKSANDRAVICIUS - FINANCIAL SPECIALIST	
Internal Technical Review carried out by: John Keenlyside	
Date of this revision: 07/11/2012	Rev. No.: 04.2
	Number of pages: 237

Indexing terms

Work approved by:

Flavio Gomes– GPM for Climate Change


☒ No distribution without permission from the Client or responsible organizational unit

☐ Limited distribution

☐ Unrestricted distribution

Table of Contents	Page
1 INTRODUCTION	4
1.1 Objective	4
1.2 Scope	4
1.3 Validation team	4
2 METHODOLOGY	5
2.1 Review of Documents	5
2.2 Follow-up Interviews	6
2.3 Resolution of Clarification and Corrective Action Requests	6
2.4 Internal Technical Review	7
3 VALIDATION CONCLUSIONS	8
3.1 Approval (49-50)	8
3.2 Participation (54)	9
3.3 Project design document (57)	9
3.4 Changes in the Project Activity	9
3.5 Project description (64)	9
3.6 Baseline and monitoring methodology	11
3.6.1 General requirement (76-77)	11
3.6.2 Project boundary (80)	13
3.6.3 Baseline identification (87-88)	14
3.6.4 Algorithms and/or formulae used to determine emission reductions (92-93)	16
3.7 Additionality of a project activity (97)	21
3.7.1 Prior consideration of the clean development mechanism (104)	21
3.7.1.1 Historical information on project timeline	22
3.7.2 Identification of alternatives (107)	23
3.7.3 Investment analysis (114)	23
3.7.4 Barrier analysis (118)	29
3.7.5 Common practice analysis (121)	29
3.8 Monitoring plan (124)	32
3.9 Sustainable development (127)	34
3.10 Local stakeholder consultation (130)	34
3.11 Environmental impacts (133)	34
4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS.....	35
5 VALIDATION OPINION	35

6	REFERENCES	36
7	CURRICULA VITAE OF THE DOE'S VALIDATION TEAM MEMBERS	40
	APPENDIX A: JOBURG LANDFILL CDM PROJECT VALIDATION PROTOCOL.....	42

1 INTRODUCTION

EcoSecurities International Limited (hereafter called “PP”) of Dawson Street, Dublin, Ireland has commissioned Bureau Veritas Certification (hereafter called “BVC”) to validate its CDM project ‘Joburg Landfill Gas to Energy Project’ (hereafter called “the project”)

This report summarizes the findings of the validation of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The validation serves as project design verification and is a requirement of all projects. The validation is an independent third party assessment of the project design. In particular, the project's baseline, monitoring plan (MP), and project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design, as documented, is sound and reasonable, and meets the stated requirements and identified criteria. Validation is deemed necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

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

1.3 Validation team

The validation team consists of the following personnel:

FUNCTION	NAME	CODE HOLDER*	TASK PERFORMED
Lead Verifier	DR. ASHOK MAMMEN	☐ Yes ☒ No	☒ DR ☐ SV ☒ RI
Verifier	ANDREW KINYANJUI	☐ Yes ☒ No	☒ DR ☒ SV XRI
Trainee Verifier	JANENE JANSEN	☐ Yes ☒ No	☒ DR ☒ SV XRI
Technical	YURI MATVEEV	☒ Yes ☐ No	☒ DR ☒ SV ☐ RI

Specialist			
Financial Specialist	BERNARDO ALEKSANDRAVICIUS	☐ Yes ☒ No	☒ DR ☐ SV ☐ RI
Internal Technical Reviewer (ITR)	JOHN KEENLYSIDE	☒ Yes ☐ No	DR ☐ SV XRI
Specialist supporting ITR		☐ Yes ☐ No	☐ DR ☐ SV ☐ RI

*DR = Document Review; SV = Site Visit; RI = Report Issuance

2 METHODOLOGY

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a validation protocol was customized for the project, according to the version 01.2 of the Clean Development Mechanism Validation and Verification Manual, issued by the Executive Board at its 55th meeting on 30/07/2010. The protocol shows, in a transparent manner, criteria (requirements), means of validation and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, 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 completed validation protocol is provided in Appendix A to this report.

2.1 Review of Documents

The Project Design Document (PDD) submitted by EcoSecurities International Limited and additional background documents related to the project design and baseline, i.e. Country Law, Guidelines for Completing the Project Design Document (CDM-PDD), Approved Methodology, Kyoto Protocol, Clarifications on Validation Requirements to be checked by a Designated Operational Entity were reviewed.

To address Bureau Veritas Certification corrective action and clarification requests, EcoSecurities International Limited revised the PDD and resubmitted it on 17/04/2012

Following CDM Executive Board notification that the proposed CDM project activity 6797 Joburg Landfill Gas to Energy Project, is under consideration for review because three requests for review have been received from members of the Board or one request for review has been

received from a Party involved Ref <https://cdm.unfccc.int/Projects/review.html>. DOE has raised additional clarifications, to address these clarification requests, EcoSecurities International Limited revised the PDD and resubmitted it on 06/11/2012

The validation conclusions presented in this report relate to the project as described in the PDD version 9, dated 06/011/2012 (Ref. [Category 1- /4/](#)).

2.2 Follow-up Interviews

On 4th–5th October 2010 Bureau Veritas Certification performed site visit and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of EcoSecurities International Limited were interviewed (see References-Persons interviewed). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
EcoSecurities International Limited and ENER-G Systems Joburg (PTY) Ltd.	➤ Training, ➤ Sales Records ➤ Production Records ➤ Project operation ➤ Sustainability ➤ Project Design and implementation ➤ Monitoring Plan and management procedures ➤ Monitoring data ➤ GHG Calculation ➤ Data uncertainty and residual risks (QA/QC) ➤ Environmental Impacts ➤ Compliance with National Laws and Regulations ➤ Additionality ➤ Baseline data ➤ Algorithms
Local Stakeholder	➤ Relevance of Sustainability Criteria ➤ Stakeholder engagement ➤ Fuel savings ➤ Fuel Costs ➤ Compliance with National Laws and Regulations

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the project design.

Corrective Action Request (CAR) is issued, where:

- (a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- (b) The CDM requirements have not been met;
- (c) There is a risk that emission reductions cannot be monitored or calculated.

The validation team may also use the term Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.

2.4 Internal Technical Review

The validation report underwent an Internal Technical Review (ITR) before requesting registration of the project activity.

The ITR is an independent process performed to examine thoroughly that the process of validation has been carried out in conformance with the requirements of the validation scheme as well as internal Bureau Veritas Certification procedures.

The Lead Verifier provides a copy of the validation report to the reviewer, including any necessary validation documentation. The reviewer reviews the submitted documentation for conformance with the validation scheme. This will be a comprehensive review of all documentation generated during the validation process.

When performing an Internal Technical Review, the reviewer ensures that:

The validation activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.

The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, review of the stakeholder comments and responses, closure of CARs, CLs and FARs during the validation exercise, review of sample documents.

The reviewer compiles clarification questions for the Lead Verifier and Validation Team and discusses these matters with Lead Verifier.

After the agreement of the responses on the 'Clarification Request' from the Lead Verifier as well as the PP(s) the finalized validation report is accepted for further processing such as uploading on the UNFCCC webpage.

3 VALIDATION CONCLUSIONS

In the following sections, the conclusions of the validation are stated.

The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are described in the Validation Protocol in Appendix A.

The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Appendix A. The validation of the Project resulted in [23](#) Corrective Action Requests (CARs) and [21](#) Clarification Requests (CLs).

The CARs and CLs were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure.

The number between brackets at the end of each section correspond to the VVM paragraph

3.1 Approval (49-50)

Letter of approval (ref Category 2 -/60/) from South Africa DNA was issued on 17/11/2011 to Ener-G Systems Joburg (Pty) Ltd. BVC validated host country approval by cross check of DNA for South Africa Archives; The DNA for South Africa makes all submitted Project Design Documents (PDDs) available for public comment for a period of 30 days prior to an approval decision being made. [Joburg Landfill Gas to Energy Project](#) was hosted on South Africa DNA website from 13 Sept 2011 – 12 Oct 2011. DNA focal point for South Africa was confirmed at <http://cdm.unfccc.int/DNA/index.html>

Letter of approval (ref Category 2 -/61/) from United Kingdom (UK) DNA was issued on 13/03/2012 to EcoSecurities International Limited and approved by UK DNA confirmed at <http://cdm.unfccc.int/DNA/index.html>. BVC received the letters of approval from the project participants and does not doubt the letters' authenticity. The letters of approval do not contain a specific version of both the PDD and the validation report. The title and contents of the letters of approval refer to the precise proposed CDM project activity title in the PDD being submitted for registration. Both LoA's include clear statements by respective DNA on the ratification

of Kyoto Protocol, voluntary participation and the contribution to host party's sustainable development

Bureau Veritas Certification considers the letters of approval are in accordance with para. 45 - 48 /VVM.

3.2 Participation (54)

Participation of Ener-G Systems (Pty) Ltd has been authorized by the host party vide LoA dated 17/11/2011

Participation of EcoSecurities International Limited has been authorized vide LoA dated 13/03/2012

3.3 Project design document (57)

Complying with para. 57/VVM, BVC hereby confirms that the PDD (Ref Category 1-/4/) complies with the latest Project Design Document Form (CDM-PDD) version 03 and Guidelines for completing the project design document (CDM-PDD) version 09.

3.4 Changes in the Project Activity

The final PDD version 09 (Ref Category 1-/4/) has following changes as compared to PDD version 01 (Ref Category 1-/1/) that was webhosted;

- Emission Reduction calculation for estimated CO₂ emission reductions was incorrect for two reasons;
 - o Joburg LF BE CER v1 data for landfill gas was blank in some sections that resulted in underestimation of annual emission reductions in tCO₂e for the first crediting period.
 - o Grid Emission Factor (GEF) data was not imported correctly from validated sources applied, a correct importation of data resulted in an increase in GEF from 0.930 to 0.977 tCO₂e/MWh, hence increasing total estimated reductions (tonnes of CO₂) from 2,991,865 tCO₂e to 3,797,465 tCO₂e in the first crediting period
- PDD version 09 has been updated to incorporate corrective Action requests and CL's as contained in Annex A.
- Additionality step Investment analysis; The IRR without CDM and with CDM is 7.47% and 26.97% and 7.31% and 23.54% in webhosted PDD and Version 09 of PDD respectively.

3.5 Project description (64)

The large scale project activity is a landfill gas collection and utilisation project at five landfills located in Johannesburg City, South Africa.

The proposed project will collect and destroy/utilise the Landfill Gas (LFG) generated at the landfill sites that would otherwise have been

released into the atmosphere resulting in GHG (CH₄) emissions to the atmosphere by destruction of LFG through flaring and also through feeding LFG to electricity generation plants for production of electricity for internal use and/or export to a local power purchaser. Electricity generated through combustion of LFG will displace coal-based electricity from the grid.

The geographical boundary for the proposed project is the Republic of South Africa, Johannesburg, Gauteng Province in the City of Johannesburg Metropolitan Municipality. The proposed project comprises of 5 sites with distinct locations as;

Linbro Park Landfill - Marlboro Drive, Sandton: 26° 05' 41.85" S & 28° 07' 13.43" E;

Marie Louise Landfill - Dobsonville Drive, Roodepoort: 26° 11' 23.89" S & 27° 53' 00.13" E;

Robinson Deep Landfill – Turffontein Road, Turffontein: 26° 13' 59.03" S & 28° 02' 14.77" E;

Goudkoppies – Houthammer Road, Devland, Lenasia: 26° 16' 52.31" S & 27° 55' 24.93" E; and

Ennerdale Landfill – Old Lawley Road, Lawley: 26° 22' 07.78" S & 27° 50' 02.80" E.

All 5 sites were confirmed by visiting each site and ascertaining coordinates by use of Global Positioning System handheld equipment.

A flaring system will be initially installed to ensure adequacy and stability of LFG extraction. Technology employed for flaring involves the installation of gas flares at each landfill site consisting of LFG extraction pipes, valves, induced vacuum blower, stack, burners, instrumentation, and control panel. LFG will be combusted at flare temperatures between 1,000°C and 1,150°C (Ref Cat 2 –/7/), with methane destruction efficiency of 99.9% (Ref Cat 2 –/7/). BVC, based on sectoral expertise deems above flaring temperature to be adequate for full destruction of LFG.

After establishing adequacy of LFG for Electricity Generation, the proposed project will install reciprocating engine generator units (gensets) ranging in capacity from 0.3MWe to 1.2MWe (Ref Cat 2 –/2/) and expected efficiency of over 30% (Ref Cat 2 –/2/) and anticipated life of 10-15 years (Ref Cat 2 –/16/).

Monitoring of LFG capture and destruction will be continuously monitored via normalised flow-meters. Flaring efficiency will be and electricity measurement will be done with standard, regularly calibrated electricity meters.

The Project is expected to produce annual estimated emission reductions of 542,495 tCO₂e during the 7 year renewable crediting period.

Complying with VVM para 64, the DOE hereby confirms that the project description in PDD (Version 09 (Ref Cat 1 –/4/)) is accurate and complete in all respects.

3.6 Baseline and monitoring methodology

3.6.1 Applicability of the selected methodology (76-77)

The steps taken to assess the relevant information contained in the PDD (Ref Cat 1–/4/) against each applicability condition of the approved methodology/tools are described below.

The Project employs the approved baseline and monitoring methodology ACM0001 Version 11, “Consolidated baseline and monitoring methodology for landfill gas project activities” EB47. ACM0001 is Valid from 11 Jun 09 to 24Nov11. Requests for registration can be submitted until 25 Jul 2012 23:59:59 GMT

Applicability condition (a): This methodology is applicable to landfill gas capture project activities, where the baseline scenario is the partial or total atmospheric release of the gas and the project activities; - During site visit BVC verified that all five proposed sites have existing landfills that will and are already generating methane. All five proposed landfills sites have total atmospheric release of LFG.

Applicability condition (b): The captured gas is flared; - through description of technology employed and sectoral expertise BVC deems that, the proposed project will flare and destroy LFG

Applicability condition (c): The captured gas is used to produce electrical energy; - The proposed project will collect and destroy (through flaring) and/or utilisation of LFG (through combustion in electricity generation engines) the generated electricity will be supplied to the South African grid

Applicability condition (d): The captured gas is used to supply consumers through natural gas distribution network; - The proposed project will not supply consumers through a natural gas distribution network, therefore this applicability criteria is not applicable

“Tool to determine project emissions from flaring gases containing methane”; Version 1, EB 28 annex 13;-

Applicability condition (a): The residual gas stream to be flared contains no other combustible gases than methane, this applicability could be qualified based on documentation of EIA carried out in June 2009 (Ref Cat 2 –/25/ to /57/)

Applicability condition (b): The residual gas stream to be flared shall be obtained from decomposition of organic material through landfills, this applicability criteria was verified during site visit.

“Tool to calculate baseline, project and/or leakage emissions from

electricity consumption”; Version 1, EB 39 annex 7

Applicability condition (a): The tool is applicable; scenario A of the tool applies to the sources of electricity consumption, Electricity consumption from the grid. The electricity is purchased from the grid only. Either no captive power plant is installed at the site of electricity consumption or, if any on-site captive power plant exists, it is not operating or it can physically not provide electricity to the source of electricity consumption. Through site visit it is observed and review of project design documents, the proposed sites are planned with access to the grid, design includes placement of a captive power plant as backup for start-up and powering of auxiliary components only.

“Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion”; Version 2, EB 41 annex 11

Applicability condition (b): This tool provides procedures to calculate project and/or leakage CO₂ emissions from the combustion the quantity of the fuel combusted and its properties, In case any fossil fuel generator is used in case of failure of grid electricity, project emissions associated from use of fossil fuel shall be determined accordingly.

“Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”; Version 5.1.0, EB 61 annex 10

Applicability condition (a): This tool calculates baseline of fossil fuels. Proposed project will utilize on-site fossil fuel generator, where CO₂ emissions from this fossil fuel combustion will be based on emissions of methane from waste that, in the absence of the project activity, would be disposed of at solid waste disposal sites (SWDS). – In absence of the project, solid waste would be disposed of in SWDS

The tool is not applicable to stockpiles and hazardous wastes, All 5 landfill sites were not utilized to dump hazardous wastes and were not stockpiles, this was verified during site visit and interview with Municipal Authorities.

Applicability condition (b): The tool is applicable in cases where the solid waste disposal site where the waste would be dumped can be clearly identified. The Project activity where the solid waste disposal site waste was/is dumped can be clearly identified; as verified by visiting all 5 proposed project sites landfill sites

“Tool to calculate the emission factor for an electricity system”. Version 2.2.0, EB 61 annex 12

Applicability condition (a): As the proposed project activity supplies activity to a grid or a project activity that results in savings of electricity that would have been provided by the grid, the proposed project estimates the OM, BM and/or CM when calculating baseline emissions for substitution of grid electricity.

Applicability condition (b): The tool is not applicable if the project electricity system is located partially or totally in an Annex-I, country; - The electricity system for South Africa is not connected in any way to an Annex-1, country.

BVC hereby confirms that the selected baseline and monitoring methodology ACM0001 Version 11, "Consolidated baseline and monitoring methodology for landfill gas project activities" adopted at EB47, "Tool to determine project emissions from flaring gases containing methane", Version 01, adopted at EB 28, "Tool to calculate baseline, project and/or leakage emissions from electricity consumption", Version 01, adopted at EB 39, "Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion", Version 02, adopted at EB 41, "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site", Version 05.1.0, adopted at EB 61, "Tool to calculate the emission factor for an electricity system", Version 02.2.0, adopted at EB 61 and Tool for the demonstration and assessment of additionality version 5.2.1 are previously approved by the CDM Executive Board, and is applicable to the project activity.

BVC confirms that, as a result of the implementation of the proposed CDM project activity, there are no greenhouse gas emissions occurring within the proposed CDM project activity boundary, which are expected to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology

3.6.2 Project boundary (80)

The project boundary encompasses the existing landfills, LFG collection systems using vertical and/or horizontal gas wells drilled into the landfill to extract the LFG and LFG capture and destruction systems (gas flares, engine generator units) on a set of five landfills in the Johannesburg metropolitan area. The project boundary is extended to include a power purchaser - the South African national grid.

The DOE validated the project boundary by:

a) Assessing relevant documentation related to the project activities, e.g. agreement between Johannesburg Metropolitan and ENER-G Systems Joburg (PTY) Ltd to collect, destroy and utilize landfill gas at five sites viz; Linbro Park, Marie Louise, Goudkoppies, Ennerdale and Robinson Deep, dated 27/05/2009 (Ref category 2-/1/), Environment Impact Assessments (Ref category 2 - /25/ to /57/) performed at all sites and verification of geographic coordinates provided in PDD (Ref category 1-/4/)

b) During site visit on 4th-5th October 2010 at ENER-G Systems Joburg

(PTY) Ltd, observation at all the physical sites has been made to clarify project boundary. The existing system comprises five Municipality landfills which do not have a methane recovery system. There are no existing facilities for methane extraction or fossil fuel energy generation at these sites. Based on the above assessment, the DOE hereby confirms that the identified boundary and the selected sources and gases are justified for the project activity. Complying with para 80 of VVM, BVC also confirms that any emission sources that will be affected by the project activity and are not addressed by the selected approved methodology were not identified.

3.6.3 Baseline identification (87-88)

The steps taken to assess the requirement given in paragraphs 81 and 82 of the VVM are described below:

DOE checked the baseline for the proposed CDM project activity as identified in the PDD, and confirms that the defined scenario in the PDD reasonably represents the anthropogenic emissions that would have occurred in the absence of project activity by the identified sources of GHG.

According to the baseline methodology, alternatives for the disposal/treatment of the waste in the absence of the project activity, i.e. the scenario relevant for estimating baseline methane emissions, to be analysed should include, *inter alia*:

LFG1: The project activity (i.e. capture of landfill gas and its flaring and/or its use) undertaken without being registered as a CDM project activity;

LFG2: Atmospheric release of the landfill gas or partial capture of landfill gas and destruction to comply with regulations or contractual requirements, or to address safety and odour concerns.

If LFG is used for generation of electric or heat energy for export to a grid and/or to a nearby industry or used on-site, realistic and credible alternatives should also be separately determined for:

- Power generation in the absence of the project activity;

For power generation, the realistic and credible alternative(s) may include, *inter alia*:

P1: Power generated from landfill gas undertaken without being registered as CDM project activity;

P2: Existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant;

P3: Existing or construction of a new on-site or off-site renewable based

cogeneration plant;

P4: Existing or construction of a new on-site or off-site fossil fuel fired captive power plant;

P5: Existing or construction of a new on-site or off-site renewable based captive power plant;

P6: Existing and/or new grid-connected power plants.

The proposed project does not include heat hence baseline for heat requirements is not considered

There were no existing power plant at the sites as witnessed during site visit hence P2 and P4 are discarded, as it would be more economically viable to purchase power from the National grid

As renewable sources other than LFG are not availability options at the projects sites it would be uneconomical to consider P3 and P5 as opposed to purchasing electricity from the National Grid.

Since heat is not considered as part of the proposed project activity, cogeneration plants are not a viable alternative, and alternatives P2 and P3 are discarded.

Grid connection already exists on all the landfill sites, construction of a new on-site fossil fuel fired captive power plant is not as plausible as opposed to purchasing power from the grid, so that P4 and P5 are also discarded.

Alternatives remaining for power generation are therefore P1 and P6.

Remaining options for plausible baseline alternatives for the project activity are then:

- **LFG 2:** Atmospheric release of the LFG, which represents the business as usual scenario;
- **P1:** Power generated from LFG undertaken without being registered as a CDM project activity, which represents the project activity.
- **P6:** Power plants connected to the grid.

DOE has performed site visit on 4th-5th October 2010 at ENER-G Systems Joburg (PTY) Ltd. It was affirmative that the proposed CDM project activity involved the introduction of a new methane extraction and flaring or electricity generation at 5 existing landfills. The existing landfills comprise anaerobic municipal dumpsites which do not have methane recovery. The proposed project activity includes the utilisation of the recovered methane to either flare/destroy the methane, or utilize the recovered methane to generate electricity using gensets ranging in capacity from 0.3 MWe to 1.2 MWe (Ref Category 2-/2/) for export to the South African national grid which is supplied by more than one fossil fuel fired generating unit. Therefore, the Consolidated baseline and monitoring

methodology for landfill gas project activities --- Version 11.0 and Step 1 of the “Tool for the demonstration and assessment of additionality” have been correctly applied as referred in Emission Reduction Calculation Spreadsheet “Joburg LF BE CER v5 17/04/2012” (Ref Category 1-/3/) and Annex 3 of PDD version 9 (Ref Category 1-/4/) to reasonably identify all realistic and credible baseline alternatives.

Based on the above assessment, the DOE hereby confirms that:

- [a] All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- [b] All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- [c] Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- [d] Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;

The approved baseline methodology has 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

3.6.4 Algorithms and/or formulae used to determine emission reductions (92-93)

The steps taken to assess the requirement outlined in paragraph 89 the VVM are described below:

The primary purpose of the proposed project activity is the installation of active LFG capturing systems on a set of five landfills in the Johannesburg area where there are no existing systems to capture and destroy the LFG gas. The most plausible baseline scenario is the release of LFG to the atmosphere and generation of electricity in the fossil fuel based grid.

The baseline emissions are calculated using the following formula.

$$BE_y = (MD_{project,y} - MD_{BL,y}) * GWP_{CH4} + EL_{LFG,y} \cdot CEF_{elec,BL,y} + ET_{LFG,y} * CEF_{ther,BL,y}$$

The proposed project activity will not include a thermal energy component and the baseline emissions are therefore calculated as;

$$BE_y = (MD_{project,y} - MD_{BL,y}) * GWP_{CH4} + EL_{LFG,y} \cdot CEF_{elec,BL,y}$$

Methane destroyed by the project calculated ex post is calculated as;

$$MD_{project,y} = MD_{flared,y} + MD_{electricity,y}$$

Methane destroyed by the project activity ex ante is calculated as;

$$MD_{project,y} = BE_{CH4,SWDS,y}/GWP_{CH4} * \epsilon_{degassing\ system}$$

The projects sums up project emissions from 3 sources viz Project emissions from electricity consumption ($PE_{EC,y}$); project emissions from fossil fuel consumption ($PE_{FC,j,y}$); and project emissions from flaring ($PE_{flare,y}$)

Where

- 1) Where project emissions due to flaring are calculated as;

$$PE_{flare,y} = \sum_{h=1}^{8760} TM_{RG,h} \times (1 - \eta_{flare,h}) \times \frac{GWP_{CH4}}{1000}$$

- 2) Where project emissions from electricity consumption are calculated as;

$$PE_{EC,y} = \sum EC_{PJ,j,y} * EF_{EL,j,y} * (1 + TD_{L,j,y})$$

- 3) And project emissions from fossil fuel consumption are calculated as;

$$PE_{FC,i,y} = \sum_i FC_{i,i,y} \times COEF_{i,y}$$

BVC has validated the parameters used for emission reduction calculations as per the ER calculation spreadsheet and the PDD version 09, and confirms these calculations to be in line with ACM0001, version 11. The assessment of various parameters follows:

1.	$BE_y = (MD_{project,y} - MD_{BL,y}) * GWP_{CH4} + EL_{LFG,y} \cdot CEF_{elec,BL,y}$	
2.	$MD_{project,y} = MD_{flared,y} + MD_{electricity,y}$	
3.	$MD_{project,y} = BE_{CH4,SWDS,y}/GWP_{CH4} * \epsilon_{degassing\ system}$	
4.	$PE_y = PE_{EC,y} + PE_{FC,j,y}$	
5.	$PE_{flare,y} = \sum_{h=1}^{8760} TM_{RG,h} \times (1 - \eta_{flare,h}) \times \frac{GWP_{CH4}}{1000}$	
6.	$PE_{EC,y} = \sum EC_{PJ,j,y} * EF_{EL,j,y} * (1 + TD_{L,j,y})$	
7.	$PE_{FC,i,y} = \sum_i FC_{i,i,y} \times COEF_{i,y}$	
Parameter	Value	Means of Validation
(BE _y) Baseline emissions in year y;	3,833,066 tCO ₂ e in the first crediting	Validated by cross checking the correctness and appropriateness of all parameters used for calculation in Emission Reduction

VALIDATION REPORT

	period	Calculation Spreadsheet (Ref category 1-/3/) and by use of sectoral expertise
$MD_{project,y} \text{ tCH}_4$	159,947	Validated by cross checking the correctness of all input values for all five landfill sites, This value includes emissions due to project emissions due to flaring, PP has selected the lower values after comparison of the values Tables 1 & 2 in PDD for conservativeness
$MD_{BL,y}$	0	During the site visit on 4-5 October 2010 it was confirmed that there doesn't exist any regulations/contracts that require combustion/destruction of methane at the landfills sites in absence of project activity
GWP_{CH_4}	21	Default value for first commitment period as per ACM0001 version 11
$EL_{LFG,y}$	67,739 MWh annual average over the first crediting period	Validated by cross checking of analysis presented for Total LFG combusted in power generation (m3 LFG) in all sites with a power generation ratio 620Nm3/h for a 1.15MW unit with an output of 972KW where 50% of LFG is CH4. Gas Engine Technical data (Ref Cat 2-/5/) This value is derived from other running plants with design similar to proposed project and operated by Ener-G, it was confirmed at interview during site visit. Also technical due diligence report March 2011 (Ref category 2-/16/), Joburg LF BE CER v5 17/04/2012 Ref category 1-/3/)
$CEF_{elec,BL,y}$	0.977 tCO2e/MWh.	DOE validated the spreadsheet version by cross checking all assumptions and reference sources.

Parameter and means of validation**GWP_{CH4}** = value 21 as per IPCC**D_{CH4}** = 0.0007168 as per ACM0001**BE_{CH4,SWDS,y}** = ex-ante estimates 484,966 tCO₂e (annual average over 1st crediting period)**CEF_{elec,BL,y}** / **EF_{EL,j,y}** = calculated from the tool to calculate emission factor for an electricity system v02.2.0 as 0.977 tCO₂e/Mwh**FC_{i,m,y}** = Amount of fossil fuel type *i* consumed by the group of power units *m* in year *y*, value; Refer annex 3 of PDD v09 (Ref Category 1-/4/)**NCV_{i,y}** Net calorific value (energy content) of fossil fuel type *i* in year *y* as per IPCC 2006 Guidelines for National Greenhouse Gas Inventories Refer annex 3 of PDD v09 (Ref Category 1-/4/)**EF_{co2,i,y}** CO₂ emission factor of fossil fuel type *i* in year *y* Refer annex 3 of PDD v09 (Ref Category 1-/4/)

VALIDATION REPORT

$EG_{m,y}$ = Net electricity generated and delivered to the grid by power plant / unit m in year y reviewed from Eskom (South African electricity supply company) NERSA (National Electricity Regulator South Africa), latest Electricity Supply Statistics *Refer annex 3 of PDD v09 (Ref Category 1-/4/)*

Φ = 0.9 Model correction factor to account for model uncertainties this value is default as per the tool

DOC_j = IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Tables 2.4 and 2.5) in accordance with the “*Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site*”,

Waste type j	DOC_j (% wet waste)
Wood and wood products	43
Pulp, paper and cardboard (other than sludge)	40
Food, food waste, beverages and tobacco (other than sludge)	15
Textiles	24
Garden, yard and park waste	20
Glass, plastic, metal, other inert waste	0

k_j = Decay rate for the waste type j based upon IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Table 3.3). The values applied are for Boreal & temperate ($MAT < 20^\circ C$) and dry ($MAP/PET < 1$) conditions and referenced from climate data for Johannesburg from the South African Weather Service. The value used is 0.04

Waste type j		Boreal and Temperate ($MAT \leq 20^\circ C$)		Tropical ($MAT > 20^\circ C$)	
		Dry ($MAP/PET < 1$)	Wet ($MAP/PET \geq 1$)	Dry ($MAP < 1000mm$)	Wet ($MAP \geq 1000mm$)
Slowly degrading	Pulp, paper, cardboard (other than sludge), textiles	0.04	0.06	0.045	0.07
	Wood, wood products and straw	0.02	0.03	0.025	0.035
Moderately degrading	Other (non-food) organic putrescible garden and park waste	0.05	0.10	0.065	0.17
Rapidly degrading	Food, food waste, sewage sludge, beverages and tobacco	0.06	0.185	0.085	0.40

$f = 0$ value is adjusted in line with recommendation from ACM0001 on basis of prior consideration of adjustment factor in ACM0001 where it is agreed that adjustment factor is zero based on interviews with landfill operator at site visit and observation of all five landfill installations and review of existing South African “Minimum Regulations for Landfills”

W_x = Total amount of organic waste in year x (tonnes) is provided in “Joburg LF BE CER” worksheet on yearly basis, by interviews with Landfill operators the values are deemed reasonable total waste from $x=1$ at all sites

Linbro park 6,559, 003

Marie Louise 5,916,436

Goudkoppies 18,230,052

Enerdale 4,070,729

Robinson Deep 19,907,110

$\eta_{flare,h}$ = Flare efficiency in the hour h picked from default value for enclosed flares as per “Tool to determine project emissions from flaring gases containing

methane
COEF_{i,j} = CO ₂ emission coefficient of fuel type <i>i</i> in year <i>y</i> from Calculated using Option B in the “Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion” therefore COEF_{i,j} = NCV_{i,y} x EFCO_{2i,y} = 3.24
NCV_{i,y} = 0.0433 TJ/t IPCC default values
EFCO_{2,i,y} = 74.8 tCO ₂ /TJ Weighted average CO ₂ emission factor of fuel type <i>i</i> in the year <i>y</i> Values are taken from IPCC (2006) for diesel
TDL_{j,y} = 8.0% collaborated by sources from Eskom Annual Report 2008, by validation by crosscheck of other sources (e.g. http://www.nationmaster.com/graph/ene_ele_pow_tra_and_dis_los_of_out-power-transmission-distribution-losses-output) indicate 6% as TDL and hence 8% is deemed conservative and reasonable
OX = value 0.1 applied as recommended by the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site. (Version 05.1.0)” was verified by site visit observations for all landfill installations and BVC deems all sites as “managed solid waste disposal sites that are covered with soil”
Where f = Fraction of methane captured at the SWDS and flared, combusted, or used in another manner; to meet the relevant regulations or contractual requirements is zero as explained above value applied is 0
MCF =1.0 Methane correction factor is value 1.0 IPCC 2006 Guidelines for National Greenhouse Gas Inventories for anaerobic managed solid waste disposal sites. During site visit it was observed for all sites to have controlled placement of waste (i.e. waste directed to specific deposition areas, with a degree of control of scavenging and a degree of control of fires) and all sites were utilizing the following: (i) cover material; (ii) mechanical compacting; or (iii) levelling of the waste
DOCf = 0.5 Fraction of degradable organic carbon (DOC) that can decompose derived from IPCC 2006 Guidelines for National Greenhouse Gas Inventories as default value from “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site. (Version 05.1.0)”
F = 0.5 in accordance to “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site. (Version 05.1.0)” value in Fraction of methane in the SWDS gas (volume fraction) (0.5)
X = the first year of landfill operation (x=1) to the year for which emissions are calculated (x=y)]; In the tool x will refer to the year since the landfill started receiving wastes By site visit interviews and reviews of EIA reports with Landfill operators it is provided in “Joburg LF BE CER (Ref Cat 1 - /4/) x; Enerdale x = 1988 Robinson Deep x = 1936 Goudkoppies x = 1989 Marie Louise x = 1991

Linbro Park x = 1969

BVC confirms that the above data used in the PDD was valid at the time of the validation.

Average annual ex-ante estimation of emission reductions is therefore; 542,495 tonnes of CO₂e

Based on the above assessment, the DOE hereby confirms that:

(a) All assumptions and data used by the project participants are listed in the PDD, including their references and sources;

(b) All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;

(c) All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;

(d) The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;

(e) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

3.7 Additionality of a project activity (97)

The steps taken and sources of information used to cross-check the information contained in the PDD on this matter are described below:

“Tool for Demonstration and Assessment of Additionality” version 5.2.1 has been employed for demonstrating and assessing the additionality of the Project. The additionality of the Project has been carefully checked, and in doing so BVC has focussed on the following:

3.7.1 Prior consideration of the clean development mechanism (104)

It has been demonstrated by the timeline of events of the Project below that CDM revenues were seriously considered in the decision to proceed with the Project prior to start of the Project and, the continuing and real action was taken to secure CDM status for the Project in parallel with its implementation.

3.7.1.1 Justification of start date of the project

Two important events took place in May 2009 i.e. agreement between PP and Municipality of Johannesburg “Final Lease & Gas Rights Agreement

Signed by the Project Developer and the Municipality of Johannesburg to develop the proposed project under CDM - 27/05/2009” (Ref Category 2-/20/) and subsequent procurement of generators by PP “Purchase order for Generators - 29/05/2009” (Ref Category 2-/2/). Before committing to invest in the project (Purchase of Generators) the PP has used the agreement to secure access to the sites by above agreement with Joburg Municipality. The overarching commitment in this case is therefore evidenced by issuance of LPO for purchase of Generators (Ref Category 2-/2/).

3.7.1.2 Notification sent to DNA and EB

PP demonstrated prior consideration of CDM through notification to Host Country DNA (Ref Category 2 -/2/) and prior consideration notification to EB (Ref Cat 2-/8/) this was validated by referring to the UNFCCC website under “Project cycle search-Prior consideration”

3.7.1.3 Historical information on project timeline

The evidences for prior consideration of the CDM that were assessed are listed below;

- a) Tender Notice published by City of Johannesburg Metropolitan Municipality to develop five sites under the CDM - 23/04/2007 (Ref Category 2-/58/)
- b) ERPA signed between the project developer and EcoSecurities - 10/07/2008 (Ref Category 2-/4/).
- c) Official notices of the EIA process for the proposed development – 19/02/2009, 07/08/2009 (Ref Category 2-/28/)
- d) Final Lease & Gas Rights Agreement Signed by the Project Developer and the Municipality of Johannesburg to develop the proposed project under CDM - 27/05/2009 (Ref Category 2-/20/)
- e) Purchase order for Generators - 29/05/2009 – Start date (Ref Category 2-/2/)
- f) Acceptance letter by DEAT, EIA and EMP reports - 09/2009 (Ref Category 2-/57/)
- g) Notification of CDM consideration sent to UNFCCC and DNA - 20/11/2009 (Ref Category 2-/8/)
- h) Validation Work Order Signed - 11/08/2010 (Ref Category 2-/59/)
- i) LoA Republic of South Africa (Ref Category 2-/60/)
- j) LoA United Kingdom of Great Britain and Northern Ireland (Ref Category 2-/61/)

Complying with para.98-103/VVM, BVC has verified this issue, which could significantly influence the additionality of the Project, and confirms that the consideration under the context of the Project has been addressed appropriately in accordance with the above guidance. Consequently, the chronological events described with the relevant documented evidences are the objective foundation on which BVC developed its validation opinions. Therefore the project complies with the latest Guidelines on the demonstration and assessment of prior

consideration of the CDM –Refer EB62 Annex 13.

3.7.2 Identification of alternatives (107)

The DOE considers the listed alternatives as mentioned in section 3.6.3 above to be credible and complete

3.7.3 Investment analysis (114)

In line with para.108/VVM, Investment analysis has been used to demonstrate the additionality of the proposed CDM project activity.

The project proponent decided to use the “Tool for the demonstration and assessment of additionality” version 5.2.1 - EB 39 Annex 10, which refers to the “Guidelines on the assessment of investment analysis” version 5 -- Refer EB 62 Annex 5 and, therefore, these guidelines were used in the following analysis.

Validation Team adopted a five steps strategy to confirm the veracity of the conclusion drawn by the project developer:

- a) Evaluating the appropriateness of the benchmark applied for the type of financial indicator presented;
- b) Conducting an assessment of parameters and assumptions used in calculating the financial indicator and determining the accuracy and suitability of parameters and cross-checking the parameters against third-party or publicly available sources;
- c) Reviewing annual financial reports related to the project participant;
- d) Assessing the correctness of computations carried out and documented; and
- e) Subjecting the critical assumptions of the project activity to reasonable variations to determine under what conditions variations in the result would occur, and the likelihood of these conditions.

a) Suitability of financial indicator and benchmark:

Financial indicator: The project participant has chosen IRR to demonstrate the additionality of the project. Tool for demonstration and assessment of additionality (Ver. 05.2.1) permits the use of financial indicator, IRR, for demonstrating the additionality using benchmark analysis. The tool permits the use of either project IRR or equity IRR. Since the project developer is demonstrating the financial unattractiveness of the project, IRR is appropriate, as it is often used by the project developers to make a decision on investing in the project. As such, the selection of IRR as financial indicator to demonstrate the additionality of the project is appropriate conforms to the Tool for demonstration and assessment of additionality (Ver. 05.2.1)

Benchmark: The project participant benchmark was based on standard parameters available in the market.

Based on paragraph 5 from Tool for demonstration and assessment of additionality (Ver. 05.2.1) which states “When applying Option II or Option III, the financial/economic analysis shall be based on parameters that are standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer. Only in the particular case where the project activity can be implemented by the project participant, the specific financial/economic situation of the company undertaking the project activity can be considered. Further paragraph 13 from EB61 Annex 13 states that “In the cases of projects which could be developed by an entity other than the project participant the benchmark should be based on parameters that are standard in the market. The DOE’s validation of the benchmark shall also include its opinion on whether a company-specific benchmark or a benchmark based on parameters that are standard in the market is suitable in the context of the underlying project activity.”

The validation team concluded that:

The WACC calculation is based on parameters that are standard in the market, considers the specific characteristics of the project type, and is not linked to the subjective profitability expectation or risk profile of this particular project developer.

Benchmark calculation description:

- 1) Risk Free Rate: According to Bloomberg, an acknowledged specialist in providing financial data and investment information, the risk free rate for South Africa (equivalent to long term government bond yields) is taken as the average yield from 1999 to 05/2009 (start date of the project activity) at 9.07%.
- 2) Risk Premium (Market Return - Risk Free Rate): In order to estimate the standard market return in the Host Country, the average equity market return has been analyzed. The FTSE/JSE index consists of all stocks traded on the South African Stock Exchange. During the most recent ten years prior to the investment decision (i.e. 1999 - 2008), the FTSE/JSE index has achieved a compounded annual return of 14.28%. The Risk premium/country premium can be determined as the difference between the average market return and the average risk free rate, or $14.28\% - 9.07\% = 5.21\%$.
- 3) A Beta (hereafter, “ β ”) coefficient of 1.00 (market average) has been applied which is conservative for LFG to energy projects in the developing world (since they have a high probability of

underperforming)*.

- 4) Income Tax Rates (28%)†: the tax rate applicable in South Africa is used to derive the pre-tax Equity IRR from the post-tax Equity IRR.

With the effective tax rate of 28% the pre-tax WACC Benchmark is calculated as follows:

equity return (post-tax) = risk free rate + (β * equity country premium) = 9.07% + (1 * 5.21%) = 14.28%

equity return (pre-tax) = equity return (post tax) / (1 – income tax rate) = 14.28 / (1-28%) = 19.83%

WACC (pre-tax) = (debt part * Cost of Debt) + (equity part * Cost of Equity (pre-tax)) = (69% * 11.15%) + (31% * 19.83%)

Benchmark: 13.82%

The risk-free rate, the market risk premium, and the Beta have been calculated based on publicly available data and presented to the DOE.

BVC agrees with all the data used in benchmark calculations and would like to point out that they were clearly presented, available to consult and correct.

b) Description of the parameters and assumptions used in the investment analysis, description of the means of validation and the procedures to cross-check the parameters against third-party or publicly available sources.

Input Values/Assumptions	Value	Means of validation
Total	ZAR 211.3	It was cross-checked by using third parties available

* A study performed for the world bank in 2007, "Landfill Gas Capture Design vs. Actual Performance and the Future for CDM Projects", <http://siteresources.worldbank.org/INTLACREGTOPURBDEV/Resources/840343-1178120035287/EditedLFGWorkshopReportAugust14.pdf>

†http://kpmghu.lcc.ch/dbfetch/52616e646f6d495638d5fe192b00c8fdb1e872a3c31c6c4c34e2b269ef7e38a8/kpmg_indirecttaxratesurvey_accessible1.pdfhttp://www.google.co.in/#hl=en&source=hp&q=tax+adjusted+cost+of+equity&aq=f&aqi=&aql=&oq=&gs_rfai=&fp=f0bb1200aec65a16

Investment	million	sources (may please identify the source). The referred value was cross-checked by the documents “29 05 2009 purchase order for generators”, from May 2009 (Ref Category 2-/2/), “Derating Spec - G3516 Dry Manifold 1136kWe Engine Spec. (Ref Category 2-/62/)", from October 1999. Other documents, as “Quote transport and insurance by GAC Laser”, from 27/2/2009 and “Letter Ener-G UK experience numbers on material cost” are also evidences for total investment cost. It is important to highlight that all the information used was available at the time of investment decision. The investment cost would equal 12,590,687 ZAR/MW, or 12,591 ZAR/kW. According to a study from US environmental protection agency*, the typical capital costs of similar projects would vary from 1,400 to 5,500 USD/kW. Considering an exchange rate of 0.7537[†] EUR/USD (as on 01/05/2009: 0.7537EUR/USD x13.11 ZAR/EUR= 9.88 ZAR/USD), the equivalent costs in ZAR would range from 13,833 ZAR/kW to 54,346 ZAR/kW per year. Thus, the investment cost for the project seems appropriate.
O&M costs	ZAR 373 / MWh	The referred value is supported by the document 16 01 2010 Ener-G Systems letter including operating cost experience statement from January 2010 (Ref Category 2-/19/). All the information used was available at the time of investment decision. Additional CL number 20 was raised to PP to substantiate O&M costs for proposed project Ener-G Systems wrote to DSW, a cleansing and solid waste company currently managing the maintenance and operations of Bisasar and Mariannhill landfill gas to electricity projects to compare/assess average O&M costs for operations, maintenance and overheads for the year July 11- June 12, which worked out to 364.81 ZAR/MWh, contained in a letter forwarded to DOE dated 23/10/2012 (ref Cat 2 -64). BVC has ascertained the authenticity of the letter by contacting DSW. DOE deems the calculation to be conservative considering that sampled site “Mariannhill” to be smaller than most sites in proposed project. PP has calculated an average O&M costs for the project activity for

* http://www.epa.gov/statelocalclimate/documents/pdf/landfill_methane_utilization.pdf, page 14

[†] <http://finance.yahoo.com/currency-converter/#from=USD;to=EUR;amt=1>

		year 2012, at 373 ZAR/MWh. BVC deems that these two figures (364.81 ZAR/MWh & 373 ZAR/MWh) compare well. Thus, it is substantiated that the O&M costs for the project are similar to other landfill gas to electricity projects in the region. The annual average fixed O&M costs for the Joburg project is 900,000 ZAR. This is comparable with Ener-G Systems contract with Enviroserv (ZAR 865,000 in 2008) (Ref Cat 2 – 65) to provide similar services for Chloorkop landfill gas management site in South Africa. This contract is deemed appropriate and conservative as it excludes electricity generation. Ener-G Systems approached Nedbank Capital for financing the landfill projects at various sites in South Africa. Nedbank Capital appointed Golder Associates Africa (Pty) Ltd to perform a due diligence of landfill projects including Joburg landfill sites, PP has forwarded the Golder Associates report, (Ref Cat 2 – 66) Golder Associates had specifically reviewed the financial assessment of the project and had given independent opinion including the project costs (OPEX) and confirmed the total OPEX costs for gensets, directly associated infrastructure and labour to be in accordance with industry norms for Joburg landfill project. Thus, BVC deems the O&M costs in the project activity are appropriate as per the industry norms and similar to other projects in the region. The value of O&M costs for the project is 23,115,198 ZAR over 62,010 MWh, leading to 373 ZAR/MWh. Thus, the O&M costs for the project seem appropriate.
Sales price or energy price	ZAR 1050 / MWh for the two first years, variable for the following years	It was cross-checked by using a third party available source. The referred value was cross-checked by the document Eskom's 2010-2018 Medium Term Power Purchase Programme from May 2008 (Ref Category 2-/17/). It is important to highlight that all the information used was available at the time of investment decision. The tariff used is per the Maximum Programme Price of Eskom's 2010-2018 Medium Term Power Purchase Programme ("MTPPP"). The document refers to an incentive program from Eskom to promote power generation, through higher tariffs in the first years of the program. After 2018, an inflation corrected electricity price is employed. Please refer to the attached financial calculations.

PLF	88%	It was cross-checked by using third party available source. The referred value was cross-checked against the Technical Due Diligence Report (Ref Category 2-/16/). It is important to highlight that all the information used was available at the time of investment decision. Ener-G have assumed 7,800 operational hours per genset per annum, reflecting 89% availability (i.e. marginally greater than (and consequently <i>more conservative</i>) than the 88% availability value used on other LFG projects by the same project developer, a value approved by a 3rd party technical consultant ("Golder Associates"). This is in line with the Guidelines on determination of PLF-EB48 Annex 11

Non-cash items related to the project activity were not considered in the IRR calculation. Taxation was not included as an expense in the IRR calculation, since the benchmark is built on a pre-tax basis.

Input values used in all investment analysis were valid and applicable at the time of the investment decision taken by the project participant. The validation team validated the timing of the investment decision and the consistency and appropriateness of the input values with this timing. Also it were validated that the listed input values had been consistently applied in all calculations. Project participants supplied spread sheets versions of all investment analysis. All formulas used in this analysis were readable and all relevant cells were viewable and unprotected.

c) Assessment of correctness of computation: BVC checked all formulas in all spread sheets presented by the project proponent. The assessment involves checking the data input taken from quotation/documents, adoption of correct accounting principle and arithmetical accuracy. BVC checked the quotation/ documents and ensured that right input has been taken in the project cost and projections. The accounting principles adopted for computing costs are found to be in order. The arithmetical accuracy is also found to be correct. The principle adopted by the project participant for computing IRR is in conformity with the "Guidance on the Assessment of Investment Analysis" issued by EB 61 annex 13. Based on the above, the IRRs of the projects were lower in contrast to the benchmarks. However, the conclusion was checked by subjecting the critical assumptions to reasonable variations.

d)Sensitivity analysis: The Guidance on Assessment of Investment Analysis requires the robustness of the conclusion arrived at to be proved through a sensitivity analysis by varying the critical assumptions to a reasonable variation required to reach the benchmark. To confirm how solid the investment analysis is, project participants presented a sensitivity analysis varying the most important parameters for the cash flow: (i) the revenue, (ii) total investment and (iii) O&M costs.

The sensitivity analysis confirms that the project activity is not financially attractive since the project's internal rate of return is lower than the benchmark in all scenarios analysed. Sensitivity analysis is available in table B.5.3, on Page 16 of PDD.

Conclusion:

Project IRR:

Joburg: 7.31%

PDD's Benchmark: 13.82%

Based on the foregoing, BVC has concluded that the project activity is not economically/financially feasible as the IRR is less than the benchmark and will continue to remain additional even under most optimistic conditions (based on sensitivity analysis), and thus the validation team has arrived at the conclusion that the project activity is additional and is not a business-as-usual case. The CDM registration would help PP in overcoming the barrier identified above.

The DOE, based on the assessment result by the financial expert engaged, hereby confirms that the underlying assumptions are appropriate and the financial calculations are correct.

Barrier analysis (118)

The DOE hereby confirms that the barrier analysis was not considered in this project review.

3.7.4 Common practice analysis (121)

The landfill gas projects location was identified as Johannesburg in the Republic of South Africa. Common practice analysis for the project was validated through the comparison of the information provided in the PDD and comparing this with site visit information and other independent sources such as internet and phone calls.

The DOE interviewed Mr. David Cornish, (General Manager), Mr. Tony Cummings (Project Manager), of Ener-G Systems Joburg (Pty) Ltd and Ms. Ina Ballik (Senior project manager of EcoSecurities International Limited (PP) on the existence of other similar projects within Johannesburg and confirms that there have been limited developments of

similar projects as proposed project.

DOE has reviewed common practice documentary evidence provided by PP and raised a clarification on common practice assessment, Refer CL8, on an independent report by SRK consulting (Ref Cat 2-/15/) and PP has provided satisfactory justification to support the conclusion that the proposed CDM project activity is not common practice.

In performing common practice analysis, PP has based common practice assessment on host country South Africa. As the proposed project type is not demonstrated to be first-of-its kind, a credibility check to complement the investment analysis (Step 2) is performed. In Country of South Africa all landfills were in scope and hence the geographical scope (e.g. defined region) of the common practice analysis is appropriate.

DOE assessed independent sources; study report from Department of Minerals and Energy and Department of Water Affairs and Forestry to assess whether similar and operational projects other than CDM project activities, are already widely observed and commonly carried out in the defined region.

PP has provided clearer verifiable source of data to determine whether proposed project is common practice namely;

- 1) "Capacity Building in Energy Efficiency and Renewable Energy: Landfill Gas Resources for Power Generation in South Africa, Department of Minerals and Energy Pretoria"
- 2) LFG extraction implementation for the similar landfill sites in South Africa. Projects that have submitted a Project Idea Note to South Africa DNA, verifiable from <http://www.energy.gov.za/>
- 3) The two references above supplement Department of Water Affairs and Forestry, 1998: Minimum requirements for waste disposal by landfill, chapter 8.4.6 Gas Management Systems, document available at: http://www.dwaf.gov.za/Dir_WQM/docs/Pol_Landfill.PDF

As survey "Landfill Gas Resources for Power Generation in South Africa" (Ref Cat 2 – 67) carried out in terms of this brief during the period from June to October 2004 established that 453 sites were operational or in the process of being issued permits. Site selection process led to the evaluation of 57 sites throughout South Africa to determine their potential to product LFG electrical energy. These were sites neighbouring Metropolitan areas with potential for LFG recovery. By tabulating the identified 57 sites on basis of size, tonnage input of solid wastes and the potential landfill gas that may be extracted from each site, a list of twenty landfills in descending order of potential was established presented below;

VALIDATION REPORT

Sl. No.	Landfill site	Province	Carbon Revenue Status
1	Linbro Park	Guateng	Under registration with UNFCCC
2	Viserhook CMC	Western Cape	considering carbon revenues for gas capture and utilization / flaring
3	Valhalla Tshwane	Guateng	considering carbon revenues for gas capture and utilization / flaring
4	Biasar Road	Kwa-zulu Natal	Registered CDM project - 1921
5	Marie Louise	Guateng	Under registration with UNFCCC
6	Robinson Deep	Guateng	Under registration with UNFCCC
7	Deerdepoort Tshwane	Guateng	considering carbon revenues for gas capture and utilization / flaring
8	Rooikraal EMM	Guateng	Registered CDM project - 3677
9	Belville South	Western Cape	considering carbon revenues for gas capture and utilization / flaring
10	Kwaggasrand Tshwane	Guateng	considering carbon revenues for gas capture and utilization / flaring
11	Onderstepoort Tshwane	Guateng	considering carbon revenues for gas capture and utilization / flaring
12	Goudkoppies	Guateng	Under registration with UNFCCC
13	Weltevreden EMM	Guateng	Registered CDM project - 3677
14	Garstkloof Tshwane	Guateng	considering carbon revenues for gas capture and utilization / flaring
15	Coastal Park	Western Cape	considering carbon revenues for gas capture and utilization / flaring
16	Koedoeskloof	Eastern Cape	Registered CDM project - 5692
17	Simmer and Jack EMM	Guateng	Registered CDM project - 3677
18	Boitshepi Emfuleni	Guateng	considering carbon revenues for gas capture and utilization / flaring
19	Southern Bloem	Free State	Atmospheric release (no gas wells on site for LFG capture)
20	Ga-Rankuwa Tshwane	Guateng	considering carbon revenues for gas capture and utilization / flaring

4 no.s highlighted projects are under the proposed project

The identified 20 landfill sites (applicable for analysis) refer page 18 of PDD version 9 is derived from document “Landfill Gas Resources for Power Generation in South Africa” considered to be reliable because it was developed by the Department of Minerals and Energy of South Africa Government. Out of 20 applicable landfills identified, suitable for comparison with proposed project, in a descending order of power generation potential relative to the year 2008, 11 landfills are releasing methane into atmosphere, 5 landfills are CDM registered projects utilizing LFG and 4 landfills are under this proposed project.

The DOE assessed the projects identified and practice by crosschecking documentation in copyrighted material “Capacity Building in Energy Efficiency and Renewable Energy – Landfill as resources for Power Generation in South Africa” Year 2004 (by the Department of minerals and Energy, available at <http://www.docstoc.com/docs/38343817/Capacity-Building-in-Energy-Efficiency-and-Renewable-Energy>) Pretoria with data

from DNA of South Africa webhosted projects available at http://www.energy.gov.za/files/esources/kyoto/2012/CDM_Projects_Portfolio_19_June%202012.pdf.

The Landfill as resources for Power Generation in South Africa study conclusions support the claims in footnote 13 of PDD version 9 pages 17. BVC agrees that 20 best opportunities indicated in PDD page 18-19 are those with most feasible in potential to produce significant landfill gas to electricity energy by 2012. BVC crosschecked data with DNA of South Africa webhosted projects to confirm consideration of CDM revenues for 11 projects whose status is indicated “considering carbon revenues for gas capture and utilization/flaring” this is by submission of Project Idea Note (PIN) to DNA of South Africa, verifiable at http://www.energy.gov.za/files/esources/kyoto/2012/CDM_Projects_Portfolio_19_June%202012.pdf. DOE deems the sources of reference provided by PP to demonstrate the practice at all 20 analysed landfill sites as reliable.

The DOE hereby confirms that the proposed CDM project activity is not common practice.

3.8 Monitoring plan (124)

The DOE hereby confirms that the monitoring plan complies with the requirements of the methodology ACM 0001, consolidated baseline and monitoring methodology for landfill gas project activities and Tool to calculate baseline, project and/or leakage emissions from electricity consumption.

The steps taken to assess whether the monitoring arrangements described in the monitoring plan are feasible within the project design are described below.

Step 1: Document review

The DOE reviewed the methodology ACM 0001, consolidated baseline and monitoring methodology for landfill gas project activities version 11, Tool to determine project emissions from flaring gases containing methane and Tool to calculate baseline, project and/or leakage emissions from electricity consumption Version 01. It was confirmed that the following list of parameters are required.

Consolidated baseline and monitoring methodology for landfill gas project activities version 11

- Total amount of LFG captured at Normal Temperature and Pressure, ($LFG_{total,y}$)
- Amount of LFG flared at Normal Temperature and Pressure, ($LFG_{flare,y}$)

- Amount of LFG combusted in power plants at Normal Temperature and Pressure ($LFG_{\text{electricity},y}$)
- Project emissions from flaring of the residual gas stream in year y, ($PE_{\text{flare},y}$)
- Methane fraction in the landfill gas, (w_{CH_4})
- Net amount of electricity generated using LFG, (EL_{LFG})
- Operation of the energy plant in a year y
- Project emissions from electricity consumption by the project activity during the year y ($PE_{\text{EC},y}$)
- Project emissions from fossil fuel combustion in fossil fuel based generators during the year y, ($PE_{\text{FC},j,y}$)

Tool to determine project emissions from flaring gases containing methane.

- Temperature in the exhaust gas of the flare, (T_{flare})
- Flare operational parameters

Tool to calculate baseline, project and/or leakage emissions from electricity consumption Version 01

- Onsite consumption of electricity attributable to the project activity during the year y, ($EC_{\text{PJ},j,y}$)
- Amount of diesel combusted to meet power requirements of project, ($FC_{i,j,y}$)

Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion” Version 02, adopted at EB 41

- The project emissions from fossil fuel combustion ($PE_{\text{FC},j,y}$)

Step 2: Monitoring plan

The DOE validated the monitoring plan in section 7.1 of the PDD version 9 dated 06/11/2012 and confirmed that the monitoring plan contains all necessary parameters, that they are clearly described and that the means of monitoring described in the plan complies with the requirements of the methodology.

The DOE has performed a review on the monitoring equipment specification and interviewed Mr. David Cornish, (General Manager), Mr. Tony Cummings (Project Manager), Ms. Ina Ballik (Senior project manager) of Ener-G Systems Joburg (Pty) Ltd (“Project developer”) It is confirmed that the monitoring arrangements described in the monitoring plan are feasible within the project design.

The DOE in addition performed a review of the operational control procedure, data collection and record keeping arrangements and management procedures, quality assurance and quality control

procedures, maintenance and calibration of monitoring equipment and organization structure of the project developer. It is confirmed that the organization's resources and facilities are sufficient to ensure that the emission reductions achieved resulting from the proposed CDM project activity can be reported ex post and verified.

The DOE hereby confirms that the project participants are able to implement the monitoring plan.

Complying with para.122-124/VVM, BVC hereby confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design and the project participants are able to implement the monitoring plan.

3.9 Sustainable development (127)

The LOA for South Africa (Ref Cat 2-/60/) the DNA has confirmed that the proposed project supports sustainable development.

3.10 Local stakeholder consultation (130)

The steps taken to assess the adequacy of the local stakeholder consultation are described below.

The DOE has performed a review of the advertisements on the national newspapers, attendance registers and minutes of meeting of the local stakeholder consultation (LSC). It is confirmed that site-wise public stakeholder and EIA meetings were conducted on various dates as follows: Linbro Park (23/02/2009), Marie Louise (25/02/2009), Goudkoppies (26/02/2009), Robinson Deep (26/02/2009) and Ennerdale (27/02/2009), all sites located in Johannesburg, South Africa. Additional meetings and site visits for the relevant authorities were conducted by the project developer on 08/07/2009 & 09/07/2009. The invited stakeholders included representatives from local authorities, local residents and office staff.

The DOE performed site visit to the respective sites: Linbro Park, Marie Louise, Goudkoppies, Robinson Deep and Ennerdale land fills

It was confirmed that, clear and transparent interviews were made and recorded, (Ref Cat 2-/29/to/56/) by the validation team. No negative comments were made. The comments of the stakeholders were taken into account during the designing of the project.

The DOE hereby confirms that the process of local stakeholder consultation is adequate.

3.11 Environmental impacts (133)

The project participants have undertaken an analysis of environmental impacts as required by South African as per the requirements of the

National Environmental Management Act (No. 107 of 1998) (NEMA) that were promulgated on 03/07/2006.

WSP Environmental South Africa (Pty) Ltd (Environmental Consultant, hereafter called WSP) was appointed by the project developer to conduct the LFG project's Environmental Impact Assessment and draft an Environmental Management plan.

Interested & Affected Parties (I & APs) were identified by placing official notices of the EIA process for the proposed development in the national newspaper, "The Citizen" on 19/02/2009. In addition advertisements were placed in "The Citizen" and "The Sowetan" newspapers on the 07/08/2009. The reports went on public review for a period of four weeks from 07/08/2009 to 04/09/2009 at appropriate public venues in the areas of the landfills

The scoping and EIA reports were prepared, updated with public comments and submitted to the Department of Environmental Affairs and Tourism (DEAT). The EIA reports include a comprehensive list of all issues raised by I & APs and Stakeholders during public and authorities meetings.

Complying with para.133/VVM, BVC hereby confirms that, the Project has met the conditions required in the EIA approval and impacts on the environment have been mitigated by means of measures of pollution avoidance and control as well as ecological recovery.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD using baseline and monitoring methodology ACM0001 Version 11, "Consolidated baseline and monitoring methodology for landfill gas project activities" adopted at EB47 was webhosted on the UNFCCC for global stakeholder's comments as per CDM requirements.

BVC published the project documents on the UNFCCC CDM website between 21 Aug 10 to 19 Sep 10 and invited comments by Parties, stakeholders and non-governmental organizations

No comments were received during this period.

5 VALIDATION OPINION

Bureau Veritas Certification has performed a validation of the "Joburg Landfill Gas to Energy Project" Project in RSA. The validation was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan; ii) follow-up

interviews with project stakeholders; iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

Project participants employed the latest "Tool for demonstration and assessment of additionality" (version 05.2.1) to demonstrate Project additionality. In line with this tool, the PDD provides investment analysis to determine that the project activity itself is not the baseline scenario

By synthetic description of the project, the project is likely to result in reductions of GHG emissions. The investment analysis demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented and maintained as designed, the project is likely to achieve the annual average over the crediting period of estimated reductions of 542,495 tonnes of CO₂.

The review of the project design documentation version 09 dated 06.11.2012 and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria. Bureau Veritas Certification thus requests registration of "Joburg Landfill Gas to Energy Project" as CDM project activity.

6 REFERENCES

Category 1 Documents:

Documents provided by EcoSecurities International Limited that relate directly to the GHG components of the project are:

- /1/ PDD Joburg LFG to Energy Project - 17 08 2010 v1
- /2/ Joburg LFG to Energy FA_17Aug10_Val Submission v2 03 02 2011
- /3/ Joburg LF BE CER v5 17/04/2012
- /4/ PDD Joburg LFG to Energy Project version 9 dated 06/11/2012
- /5/ Joburg LFG to Energy FA_06 11 2012_RfR - public

Category 2 Documents:

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

- /1/ 3-page Joburg Municipality & Ener-G Systems Joburg (pty) Ltd agreement 27/05/2009
- /2/ Purchase order for generators 29/05/2009
- /3/ Landfill SRK Consulting LFG report with appendices March 2010

- /4/ ERPA_LP, 10/07/2008
- /5/ 1150kW Landfill Gas Generator Package 2005
- /6/ B.6.2_density diesel
- /7/ Biogas Technical Manual
- /8/ CDM consideration notification 20/11/2009
- /9/ CI-6202_3651_000 Biogas clarification of dry basis measurements
- /10/ Joburg LF draft data flow block diagram 14/04 2011
- /11/ Joburg LF draft data flow chart 14/04/2011
- /12/ Joburg LF draft oganogram 14/04/2011
- /13/ Microsoft Word - 300kW,400,500kw genset spec inc
- /14/ PIKITUP mth to mth summary tonner 2001-2007
- /15/ Landfill SRK Consulting LFG report with appendices march 2010
- /16/ Relevant pages of Technical due diligence report by Golder Associates
- /17/ Relevant pages of the Eskom MTPPP
- /18/ Relevant pages of LFG Capture Design vs. Actual Performance and the Future for CDM Projects
- /19/ Letter of Ener-G Systems Joburg (pty) Ltd 16/01/2010 - Operating cost experience statement
- /20/ 3-page Joburg Municipality & Ener-G Systems Joburg (pty) Ltd 27/05/2009
- /21/ Airspace survey
- /22/ DWAF1998, DWAF 2005
- /23/ Flare Systems Biogas Technology
- /24/ Guidance on landfill gas flaring v2.1_Nov2002
- /25/ Ennerdale Scoping Report.Final
- /26/ App A_WSP Environment & Energy Capability Document (Final)
- /27/ App B_Authorities Database
- /28/ App C_Site Notice Ennerdale
- /29/ App E_Citizen newspaper advertisement
- /30/ App G_AppA Authority Meeting Recorded Comments
- /31/ App G_AppA Public Meeting Comments
- /32/ App G_AppB Public Meeting Attendance Register
- /33/ App G_Ennerdale Public Meeting Minutes
- /34/ Goudkoppies Scoping Report.Final
- /35/ App E_Citizen newspaper advertisement
- /36/ App C_Site Notice Goudkoppies
- /37/ APP G_APPB Public Meeting Attendance Register
- /38/ App H_Received comments
- /39/ Linbro Park Scoping Report.Final
- /40/ App G_AppB Authority Meeting Attendance Register
- /41/ App H_Received comments1
- /42/ Linbro Park Scoping Report.Final
- /43/ App E_Citizen newspaper advertisement
- /44/ App G_AppB Authority Meeting Attendance Register
- /45/ App H_Received comments
- /46/ Marie Louise Scoping Report.Final
- /47/ App E_Citizen newspaper advertisement

- /48/ App G_AppA Marie Louise Recorded Comments
- /49/ App G_AppB Public Meeting Attendance Register
- /50/ App H_Received comments1
- /51/ Marie Louise Scoping Report.Final
- /52/ App C_Site Notice Marie Louise
- /53/ App G_AppA Marie Louise Recorded Comments
- /54/ App G_AppB Public Meeting Attendance Register
- /55/ Robinson Deep Scoping Report.Final
- /56/ App G_Robinson Deep Public Meeting Minutes
- /57/ Acceptance letter by DEAT dated 22/6/2009
- /58/ Tender notice dated 23/04/2007
- /59/ Validation work order dated 11/08/2010
- /60/ LOA Republic of South Africa dated 17/11/2011
- /61/ LOA United Kingdom of Great Britain and Northern Ireland dated 13/3/2012
- /62/ G3516 1136kWe Engine Spec
- /63/ CEF South Africa
- /64/ DSW letter confirming O&M cost for Durban landfill
- /65/ Enviroserv operation and maintenance contract with Ener-G
- /66/ Golder's Report highlighted
- /67/ Landfill Gas Resources for Power Generation in South Africa" study published by the South Africa Department of Minerals and Energy

Persons interviewed:

/1/	Ina Ballik	Senior Project Manager, EcoSecurities
/2/	Mark Ghorayeb	Regional Implementation Manager – Middle East and Africa, EcoSecurities International Limited
/3/	David Cornish	General Manager, Ener-G Systems Joburg (pty) Ltd
/4/	Amin Bekai	Implementation Manager, EcoSecurities International Limited
/5/	Tony Cummings	Project Manager Ener-G Systems Joburg (pty) Ltd
/6/	Mzukisi Tshem	Pick It Up (Waste management company - Johannesburg)
/7/	Mary Zibi	Area Resident

7 CURRICULA VITAE OF THE DOE'S VALIDATION TEAM MEMBERS

Bureau Veritas Certification - Lead Verifier and team leader – Dr. Ashok Mammen

Over 20 years of experience in chemical and petrochemical field. Dr. Mammen is a lead auditor and tutor for environment, safety and quality management systems. He is also a lead verifier and lead tutor for GHG projects and has been involved in the validation and verification processes of more than 100 CDM/JI/VCS and other GHG projects.

Bureau Veritas Certification - team member – Andrew Kinyanjui

Graduated with Diploma in Chemical Engineering, he had 5 yrs experience in Industrial production before joining BV. He has obtained 7 years experience in management systems audits and training and three years experience in CDM validation / verification at BV. He obtained the certificate of CDM Lead Verifier certificate and Lead auditor for ISO 14001 He conducted Validation / Verification for more than 10 CDM/GS Projects.

Bureau Veritas Certification – Trainee team member – Janene Jansen

Graduated with B. Tech Degree Environmental Health, with 5 years experience in Auditing and has attended CDM Lead Verifier and Lead Auditor in 14001. She is a lead Auditor in Environment, Safety and Quality with Bureau Veritas

Bureau Veritas Certification – Financial Specialist Bernardo Aleksandravicius is graduated in Business Administration with a very expressive experience in valuation of new projects in the electrical and technology sectors; Equity analyst with focus on the consumer staples, consumer discretionary, technology and telecommunications sectors for many companies in Brazil.

Bureau Veritas Certification – Technical Specialist Yuri Matveev

Yuri Maveev is an expert in energy from biomass and solid/liquid waste technologies (anaerobic digestion, landfill gas collection, Energy Generation and utilization), municipal solid waste management, energy conservation technologies, renewable energy sources, solar energy, environmental protection and climate change, as well as in public relations. He has experience with CDM /JI projects related to landfill gas, flaring and generation of electricity from landfill projects.

Bureau Veritas Certification – Internal Technical Reviewer

John Keenlyside BSc MSc MCIWM : a mineral exploration geologist with 21 years experience of all aspects of gaseous pollution monitoring (including ambient air and combustion gases), emission modelling, greenhouse gas emission reduction quantification in a regulatory (expert witness for UK Govt.) , consultancy, and operational context. Wastes Management sector expert (WM operations, landfill engineering, recycling, diversion to composting, landfill gas control system design, installation and operation) and CDM methane capture project manager (Environmental Impact Assessment reports, Project Design Documents, DNA / DOE Validation liaison, design of ex-post ghg emission reduction quantification and data storage / processing firmware in Honeywell SX recorders, ensuring project is ACM0001 / PDD compliant and Verification ready). New publications peer reviewer for UK Chartered Institute for Wastes Management, UK Construction Industry Research and Information association, UK Building Research Establishment and UK Environment Agency research manager. Has worked on projects in UK, Kingdom of Saudi Arabia, Islamic Republics of Pakistan and Sudan.

APPENDIX A

Table 1 Joburg Landfill Gas to Energy Project Protocol

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
--------------------	------	---	----------	----------------	----------------

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
1. Approval			<i>Republic of South Africa</i>	United Kingdom of Great Britain and Northern Ireland		
a. Have all Parties involved approved the project activity?	VVM	44	LoA from Republic of South Africa is provided	LoA of United Kingdom of Great Britain and Northern Ireland is provided	CL1	Ok
b. Has the DNA of each Party indicated as being involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval? (If yes, provide the reference of the letter of approval, any supporting documentation, and specify if the letter was received from the project participant or directly from the DNA)	VVM	45	Yes a written letter issued by the host country DNA was received from the PP (Ref Cat 2-60)	Yes a written letter issued by the host country DNA was received from the PP (Ref Cat 2-61)		OK
c. Does the letter of approval from DNA of each Party involved:	VVM	45				OK
i. confirm that the Party is a Party of the Kyoto Protocol?	VVM	45.a	Yes it is indicated that South Africa is a party to the Kyoto Protocol	Yes it is indicated that UK is a party to the Kyoto Protocol		OK
ii. confirm that participation is voluntary?	VVM	45.b	Yes it is indicated that participation is Voluntary	Yes it is indicated that participation is Voluntary		OK
iii. confirm that, in the case of the host Party, the proposed CDM project activity contributes to the sustainable development of the country?	VVM	45.c	Yes the project contributes to the sustainability development of the country	Yes the project contributes to the sustainability development of the country		OK
iv. Refers to the precise proposed CDM project activity title in the PDD being submitted for registration?	VVM	45.d	Yes it refers to the specific proposed project activity	Yes it refers to the specific proposed project activity		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
d. Is(are) the letter(s) of approval unconditional with respect to (i) to (iv) above?	VVM	46	The LOA is issued against PDD of the project	Pending CL1		OK
e. Has(ve) the letter(s) of approval been issued by the respective Party's designated national authority (DNA) and is valid for the CDM project activity under validation?	VVM	47	Yes	issued and received from Jason Bailey the DNA of UK		OK
f. Is there doubt with respect to the authenticity of the letter of approval?	VVM	48	No, this was confirmed by visiting the DNA website	No,		OK
g. If yes, was verified with the DNA that the letter of approval is authentic?	VVM	48	Yes	Yes		OK
2. Participation			PP1 (insert PP1 name)	PP2 (insert PP2 name)		OK
a. Have all project participants been listed in a consistent manner in the project documentation?	VVM	51	ENER·G Systems Joburg (PTY) LTD is listed in a consistent manner in the project documentation	EcoSecurities International Limited is listed in a consistent manner in the project documentation		OK
b. Has the participation of the project participants in the project activity been approved by a Party to the Kyoto Protocol?	VVM	51	Yes	yes		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS		Draft Concl	Final Concl
c. Are the project participants listed in tabular form in section A.3 of the PDD?	VVM	52	Tabular form is used to list ENER·G Systems Joburg (PTY) Ltd. as Project participants in A.3 of PDD	Tabular form is used to list EcoSecurities International Limited as Project participants in A.3 of PDD		OK
d. Is the information in section A.3 consistent with the contact details provided in annex 1 of the PDD?	VVM	52	List of Project Participants in A.3 is consistent with contact details in annex 1	List of Project Participants in A.3 is consistent with contact details in annex 1		OK
e. Has the participation of each of the project participants been approved by at least one Party involved, either in a letter of approval or in a separate letter specifically to approve participation? (Provide reference of the approval document for each of the project participants)	VVM	52	Yes participation has been authorised by the Host Country	Yes participation has been authorised by the UK DNA Para 3		OK
f. Are any entities other than those approved as project participants included in these sections of the PDD?	VVM	52	No			OK
g. Has the approval of participation issued from the relevant DNA?	VVM	53	Yes			OK
h. Is there doubt with respect to (g) above?	VVM	53	No			
i. If yes, was verified with the DNA that the approval of participation is valid for the proposed CDM project participant?	VVM	53	This was confirmed by checking the DNA publicly available database for locally hosted applications for LoA as per local process			Ok
3. Project design document						

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
a. Is the PDD used as a basis for validation prepared in accordance with the latest template and guidance from the CDM Executive Board available on the UNFCCC CDM website?	VVM	55	CLEAN DEVELOPMENT MECHANISM PROJECT DESIGN DOCUMENT FORM (CDM-PDD) Version 03 - in effect as of: 28 July 2006 is used by PP and is the latest template		Ok
b. Is the PDD in accordance with the applicable CDM requirements for completing the PDD?	VVM	56	Details below in section c		Ok
c. In CDM-PDD section A.1 are the following provided?	EB 41	Ann 12			
i. Title of project	EB 41	Ann 12	Joburg Landfill Gas to Energy Project		Ok
ii. Current version number and date of document	EB 41	Ann 12	PDD Version Number 9, Dated 06 Nov 2012		Ok
d. In CDM-PDD section A.2 are following provided (max. one page)?	EB 41	Ann 12			
i. A brief description of the project activity covering purpose which includes the scenario existing prior to the start or project, present scenario and baseline scenario	EB 41	Ann 12	The objective of the project is to collect and destruct/utilize the landfill gas (LFG) generated at the Johannesburg landfill sites. 1. In the first stage, LFG will be captured and destroyed by using a LFG flare 2. LFG will be fired to generate electricity. Excess LFG, if any, will be flared.		Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. Explanation on how the GHG emission reductions are effected	EB 41	Ann 12	LFG generated at project site will be flared and/or used to generate electricity thus avoiding release of methane into the atmosphere and displacing fossil fuel electricity generation in the grid		OK
iii. The PP's vies on the contribution of project activity to sustainable development	EB 41	Ann 12	Integration of infrastructure which will improve environmental conditions. Disposal of the perilous constituents, particularly methane, safely and to control and reduce odour nuisance and health risks Project minimises environmental damage through reduced methane emissions. in improving landfill management practices throughout south Africa optimises the use of natural resources and will act as a clean technology demonstration project, encouraging less dependency on grid-supplied electricity		OK
iv. Are there any changes/modifications compared to the webhosted PDD?	EB 41	Ann 12	There are no changes as compared to the webhosted PDD		Ok
e. In CDM-PDD section A.3 are following provided in the tabular format?	EB 41	Ann 12			
i. List of project participants and parties	EB 41	Ann 12	Yes, List is provided in A.3 Parties are listed as Republic of South Africa (host), and United Kingdom of Great Britain and Northern Ireland. Project participants are ENER·G Systems Joburg (PTY) LTD (private entity) and EcoSecurities International Limited (private entity)		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl																		
ii. Identification of Host Party			Republic of South Africa is the host country		OK																		
iii. Indication whether the Party wishes to be considered as project participant	EB 41	Ann 12	Host Party is not to be considered as participant		OK																		
f. In CDM-PDD section A.4.1 are following provided?	EB 41	Ann 12			OK																		
i. Technical description, location, host party(ies) and address as required	EB 41	Ann 12	Address and locations for all five sites are provided as below; <table><tr><th>Name of Site</th><th>Address</th><th>GPS Coordinates</th></tr><tr><td>Linbro Park</td><td>Marlboro Drive, Sandton</td><td>26° 05' 41.85" S 28° 07' 13.43" E</td></tr><tr><td>Marie Louise</td><td>Dobsonville Drive, Roodepoort</td><td>26° 11' 23.89" S 27° 53' 00.13" E</td></tr><tr><td>Robinson Deep</td><td>Turffontein Road, Turffontein</td><td>26° 13' 59.03" S 28° 02' 14.77" E</td></tr><tr><td>Goudkoppies</td><td>Houthammer Road, Devland, Lenasia</td><td>26° 16' 52.31" S 27° 55' 24.93" E</td></tr><tr><td>Ennerdale</td><td>Old Lawley Road, Lawley</td><td>26° 22' 07.78" S 27° 50' 02.80" E</td></tr></table> Validation of the physical sites was by visiting all sites during site visit Technical description is provided in PDD on page 5. All the 5 sites utilize LFG collection system and flaring system with provision to generate electricity	Name of Site	Address	GPS Coordinates	Linbro Park	Marlboro Drive, Sandton	26° 05' 41.85" S 28° 07' 13.43" E	Marie Louise	Dobsonville Drive, Roodepoort	26° 11' 23.89" S 27° 53' 00.13" E	Robinson Deep	Turffontein Road, Turffontein	26° 13' 59.03" S 28° 02' 14.77" E	Goudkoppies	Houthammer Road, Devland, Lenasia	26° 16' 52.31" S 27° 55' 24.93" E	Ennerdale	Old Lawley Road, Lawley	26° 22' 07.78" S 27° 50' 02.80" E		Ok
Name of Site	Address	GPS Coordinates																					
Linbro Park	Marlboro Drive, Sandton	26° 05' 41.85" S 28° 07' 13.43" E																					
Marie Louise	Dobsonville Drive, Roodepoort	26° 11' 23.89" S 27° 53' 00.13" E																					
Robinson Deep	Turffontein Road, Turffontein	26° 13' 59.03" S 28° 02' 14.77" E																					
Goudkoppies	Houthammer Road, Devland, Lenasia	26° 16' 52.31" S 27° 55' 24.93" E																					
Ennerdale	Old Lawley Road, Lawley	26° 22' 07.78" S 27° 50' 02.80" E																					
ii. Detailed physical location with unique identification of the project activity (eg. Longitude/latitude) – not to exceed one page	EB 41	Ann 12	Addresses and GPS Coordinates for the five sites are; Linbro Park Landfill: Marlboro Drive, Sandton 26° 05' 41.85" S 28° 07' 13.43" E Marie Louise landfill: Dobsonville Drive, Roodepoort 26° 11' 23.89" S 27° 53' 00.13" E Robinson Deep Landfill: Turffontein Road, Turffontein 26° 13' 59.03" S 28° 02' 14.77" E	CAR 1	Ok																		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Goudkoppies Landfill: Houthammer Road, Devland, Lenasia 26° 16' 52.31" S 27° 55' 24.93" E Ennerdale Landfill: Old Lawley Road, Lawley 26° 22' 07.78" S 27° 50' 02.80" E This information is not presented in the correct section of PDD A.4.1.4.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
iii. Are there any changes/modifications compared to the webhosted PDD?	EB 41	Ann 12	The final PDD version 09 (Ref Category 1-/4/) has following changes as compared to PDD version 01 (Ref Category 1-/1/) that was webhosted; - Emission Reduction calculation for estimated CO₂ emission reductions was incorrect for two reasons; - Joburg LF BE CER v1 data for landfill gas was blank in some sections that resulted in underestimation of annual emission reductions in tCO₂e for the first crediting period. - Grid Emission Factor (GEF) data was not imported correctly from validated sources applied, a correct importation of data resulted in an increase in GEF from 0.930 to 0.977 tCO₂e/MWh, hence increasing total estimated reductions (tonnes of CO₂) from 2,991,865 tCO₂e to 3,797,465 tCO₂e in the first crediting period - PDD version 09 has been updated to incorporate corrective Action requests and CL's as contained in Annex A. - Additionality step Investment analysis; The IRR without CDM and with CDM is 7.47% and 23.54% and 7.31% and 21.04% in webhosted PDD and Version 09 of PDD respectively.		Ok
g. In CDM-PDD section A.4.2 is the list of	EB 41	Ann	Yes, Category is provided as Sectoral Scope 13 - Waste Handling and Disposal.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
categories of project activities provided?		12			
h. In CDM-PDD section A.4.3 are following provided?	EB 41	Ann 12			
i. A description of how environmentally safe and sound technology, and know-how, is transferred to the Host Party(ies)	EB 41	Ann 12	Technology transfer is involved in the project through the introduction and demonstration of a technology for capture, destruction/ utilization of LFG and implementation of a training program for maintenance and operation of the project equipments. Information as to how environmentally safe the technology is not provided	CAR2	Ok
ii. Explanation of purpose of project activity with scenario existing prior to the start of project, scope or present activities and the baseline scenario	EB 41	Ann 12	Prior to implementation of the project activity, the LFG was being freely emitted into the atmosphere resulting in GHG emissions. The Project involves the destruction/utilisation of methane emissions as well as the displacement of electricity from the South African coal-based grid, resulting in a consequent reduction in CO2 emissions. In the baseline scenario, the LFG would have been released into the atmosphere resulting in GHG (CH4) emissions to the atmosphere. The electricity would have been produced in the fossil fuel based South African grid resulting in CO2 emissions.		OK
iii. List and arrangement of the main	EB 41	Ann	Following are not provided	CAR3	Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
manufacturing/production technologies, systems and equipments involved		12	1) list and arrangement of the main production technologies involved 2) There is no mention of parameters to be employed in Flaring 3) power generation equipment arrangements for each site in projects lifetime 4) monitoring technology to be employed 5) arrangements for power evacuation		
iv. The emissions sources and GHGs involved	EB 41	Ann 12	The emissions sources and GHGs involved Baseline emissions; CO2 and CH4, project emission is CO2		Ok
v. Are there any changes/modifications compared to the webhosted PDD?	EB 41	Ann 12	There are no changes as compared to webhosted PDD		OK
i. In CDM-PDD section A.4.4 is the estimation of emission reductions provided as requested in a tabular format?	EB 41	Ann 12	Yes, Table A.4.4.1 provides a summary of emission reductions		OK
j. In CDM-PDD section A.4.5 is Information regarding Public funding provided?	EB 41	Ann 12	The project will not receive any public funding from Parties included in Annex I of the UNFCCC		OK
k. In CDM-PDD section B.1 are following provided?	EB 41	Ann 12			
i. The approved methodology and version	EB 41	Ann	The large scale methodology		Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
number		12	ACM0001 Version 11, adopted at EB47, "Consolidated baseline and monitoring methodology for landfill gas project activities" is Valid from 11 Jun 09 onwards, has been used in the project activity and is the most recent version		
ii. Any methodologies or tools which the above approved methodology draws upon and their version number	EB 41	Ann 12	• "Tool for the demonstration and assessment of additionality", (hereafter also referred to as "Additionality tool") Version 05.2.1 valid from 11 August 2011 shall be applied • "Tool to determine project emissions from flaring gases containing methane", Version 01, adopted at EB 28. • "Tool to calculate baseline, project and/or leakage emissions from electricity consumption", Version 01, adopted at EB 39. • "Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion", Version 02, adopted at EB 41 • "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site", Version 05.1.0, adopted at EB 61. • Tool to calculate the emission factor for an electricity system", Version 02.2.0, adopted at EB 61 Version 02.2.1 EB 63, Annex 19 valid from 29 September 2011 shall be applied	CAR 4	Ok
I. In CDM-PDD section B.2 are following provided?	EB 41	Ann 12			
i. Justification of the choice of methodology that the project activity meets each of the applicability	EB 41	Ann 12	This methodology is applicable to landfill gas capture project activities where the baseline scenario is the	OK	Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
conditions			partial or total atmospheric release of the gas, and the project activities include situations such as: a) The captured gas is flared; and/or b) The captured gas is used to produce energy (e.g. electricity/thermal energy); and/or c) The captured gas is used to supply consumers through natural gas distribution network. In the proposed project activity, the captured LFG is flared and/or used to produce energy (electricity only). The captured LFG is flared initially. After completion of phase one, engines shall be installed to generate electricity using LFG thereby meeting applicability condition b). Applicability condition c) is not applicable as the project does not involve any natural gas distribution network supplying LFG to consumers. The Project therefore fulfils the conditions of options a) and b) of ACM0001 applicability, and is consequently considered the most appropriate methodology for the proposed project activity.		
ii. Documentations with references that had been used. This can be provided in Annex 3 instead	EB 41	Ann 12	Yes. Relevant data used in calculation have been presented in tables in annex 3		Ok
m. In CDM-PDD section B.3 are following provided?	EB 41	Ann 12			

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. Description of all sources and gases included in the project boundary in the table	EB 41	Ann 12	Table B3.1: presents a summary of gases and sources included in the project boundary and justification/explanation provided where gases and sources are not included On-site fossil fuel consumption due to the project activity other than for electricity generation and Emissions from on-site electricity use in project boundary includes CO2 emissions		OK
ii. A flow diagram of the project boundary physically delineating the project activity	EB 41	Ann 12	Flow diagram is presented on page 10 of PDD refer - Figure B.3.1 - Flow diagram of Project set-up		OK
iii. The flow diagram with all equipment, systems and flows of mass and energy etc	EB 41	Ann 12	Sec B.3 of the CDM-PDD does not contain a clear description of the project equipment.	CL 2	Ok
n. In CDM-PDD section B.4 are following provided?	EB 41	Ann 12			OK
i. Explanation how the most plausible baseline scenario is identified in accordance with the selected baseline methodology	EB 41	Ann 12	Yes, most plausible baseline scenario is identified in accordance with the tool for the demonstration and assessment of additionality		OK
ii. Justification of key assumptions and rationales	EB 41	Ann 12	yes Justification of key assumptions and rationales and has been validated by cross check of individual parameters elsewhere in main body of the report		OK
iii. Transparent illustration of all data used to determine the baseline scenario (variables, parameters, data sources, etc.)	EB 41	Ann 12	Yes a transparent illustration of all data used to determine the baseline scenario (variables, parameters, data sources, etc.) in verifiable footnotes and submitted attachments		OK
iv. A transparent and detailed description of the identified baseline scenario,	EB 41	Ann 12	Yes provided in section B4 and discussed in section B.5 but use of latest "Tool for the demonstration and		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl									
including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed project activity			assessment of additionality											
v. Are there any changes/modifications compared to the webhosted PDD?	EB 41	Ann 12	There are no modifications as compared to webhosted PDD		OK									
o. In CDM-PDD section B.5 are following provided?	EB 41	Ann 12												
i. Explanation of how and why this project activity is additional and therefore not the baseline scenario in accordance with the selected baseline methodology	EB 41	Ann 12	Benchmark analysis is applied hence Table B.5.1: Financial results of the project (LFG 1 or P1) with and without carbon finance <table><tr><td></td><td>Without CDM</td><td>With CDM</td></tr><tr><td>IRR</td><td>7.31 %</td><td>23.54 %</td></tr><tr><td>Pre-tax WACC (the chosen benchmark)</td><td colspan="2">13.82%</td></tr></table>		Without CDM	With CDM	IRR	7.31 %	23.54 %	Pre-tax WACC (the chosen benchmark)	13.82%			OK
	Without CDM	With CDM												
IRR	7.31 %	23.54 %												
Pre-tax WACC (the chosen benchmark)	13.82%													
ii. Justification of key assumptions and rationales	EB 41	Ann 12	Refer section 6 investment analysis		Ok									
iii. Transparent illustration of all data used to determine the baseline scenario (variables, parameters, data sources etc)	EB 41	Ann 12	Refer section 6 investment analysis		Ok									

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl														
iv. Evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity, if the starting date of the project activity is before the date of validation	EB 41	Ann 12	<table><tr><td>Tender Notice published by City of Johannesburg Metropolitan Municipality to develop five sites under CDM.</td><td>Ref Cat 2 - /58/</td></tr><tr><td>ERPA signed between the project developer and EcoSecurities</td><td>Ref Cat 2 - /4/</td></tr><tr><td>Final Lease & Gas Rights Agreement Signed by the Project Developer and the Municipality of Johannesburg to develop the proposed project under CDM</td><td>Ref Cat 2 - /1/</td></tr><tr><td>Purchase order for Generators- Project start date</td><td>Ref Cat 2 - /2/</td></tr><tr><td>Submittal EIA and EMP reports</td><td>Ref Cat 2 - /25-57/</td></tr><tr><td>Notification of CDM consideration sent to UNFCCC and DNA</td><td>Ref Cat 2 - /8/</td></tr><tr><td>Validation Work Order Signed</td><td>Ref Cat 2 - /59/</td></tr></table>	Tender Notice published by City of Johannesburg Metropolitan Municipality to develop five sites under CDM.	Ref Cat 2 - /58/	ERPA signed between the project developer and EcoSecurities	Ref Cat 2 - /4/	Final Lease & Gas Rights Agreement Signed by the Project Developer and the Municipality of Johannesburg to develop the proposed project under CDM	Ref Cat 2 - /1/	Purchase order for Generators- Project start date	Ref Cat 2 - /2/	Submittal EIA and EMP reports	Ref Cat 2 - /25-57/	Notification of CDM consideration sent to UNFCCC and DNA	Ref Cat 2 - /8/	Validation Work Order Signed	Ref Cat 2 - /59/		
Tender Notice published by City of Johannesburg Metropolitan Municipality to develop five sites under CDM.	Ref Cat 2 - /58/																		
ERPA signed between the project developer and EcoSecurities	Ref Cat 2 - /4/																		
Final Lease & Gas Rights Agreement Signed by the Project Developer and the Municipality of Johannesburg to develop the proposed project under CDM	Ref Cat 2 - /1/																		
Purchase order for Generators- Project start date	Ref Cat 2 - /2/																		
Submittal EIA and EMP reports	Ref Cat 2 - /25-57/																		
Notification of CDM consideration sent to UNFCCC and DNA	Ref Cat 2 - /8/																		
Validation Work Order Signed	Ref Cat 2 - /59/																		
p. In CDM-PDD section B.6.1 are following provided?	EB 41	Ann 12																	
i. Explanation as to how the procedures, in the approved methodology to	EB 41	Ann 12	Explanation as to how the procedures, in the approved methodology to calculate project emissions, baseline		OK														

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
calculate project emissions, baseline emissions, leakage emissions and emission reductions are applied to the proposed project activity			emissions, leakage emissions and emission reductions are applied to the proposed project activity is provided 1) Therefore Baseline emissions $BE_y = (MD_{project,y} - MD_{BL,y}) * GWP_{CH4} + (EL_{LFG,y} \cdot CEF_{elec,BL,y}) + (ET_{LFG,y} * CEF_{ther,BL,y})$ As the proposed project activity does <i>not include</i> a thermal energy component, all following equations exclude this component (for simplification). Since the project <i>may</i> include an electricity generation component, all equations include this component. During site visit observation and interviews including review of project plans, the proposed project activity is confirmed to not include a thermal energy component and therefore the equation can be calculated as;- $BE_y = (MD_{project,y} - MD_{BL,y}) * (GWP_{CH4} + EL_{LFG,y} \cdot CEF_{elec,BL,y})$ 2) There is no regulation/contract for destruction of methane from the landfill in the baseline, and hence $MD_{BL,y}$ (the amount of methane that would have been		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			destroyed/combusted during year y, in the absence of the project due to regulatory and/or contractual requirement) is zero. BVC interviewed stakeholders specifically Johannesburg metropolitan Municipality official in charge of Landfill sites and review of existing legal / other requirements (MINIMUM REQUIREMENTS FOR WASTE DISPOSAL BY LANDFILL - DEPARTMENT OF WATER AFFAIRS AND FORESTRY Second Edition 1998) by South Africa Department of Environmental Affairs (Waste Licences issued for 5 landfill sites to Ener-g systems Joburg Pty) ltd at time of site visit. There is no regulation/contract for destruction of methane from the landfill in the baseline, and hence MD_{BL,y} Value zero is correctly applied ϕ = Model correction factor to account for model uncertainties value 0.9 is correctly applied in line with “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site. (Version 05.1.0)”		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. Equations used in calculating emission reductions	EB 41	Ann 12	$BE_y = (MD_{project,y} - MD_{BL,y}) * GWP_{CH4} + E_{LLFG,y} CEF_{elec,BL,y}$ As the proposed project activity does not include a thermal energy component GWP_{CH4} Global Warming Potential value for methane [tCO₂ e/tCH₄] = 21 for the first commitment period in accordance with IPCC guidelines 2006 Procedure to be followed for expost calculations of LFG destroyed in project activity is; In scenario where methane is flared Methane destroyed by the project activity ($MD_{project,y}$) is calculated as; $MD_{project,y} = MD_{flared,y} + MD_{electricity,y}$ In scenario where methane is used for generating of electricity, the quantity of methane destroyed through combustion in the electricity generation engines is calculated as; $MD_{electricity,y} = LFG_{electricity,y} * w_{CH4,y} * D_{CH4}$ To estimate emissions ex ante; $MD_{project,y} = BE_{CH4,SWDS,y} / GWP_{CH4} * \epsilon_{degassing\ system}$ Where $\epsilon_{degassing\ system}$ is the efficiency of the degassing system and; $BE_{CH4,SWDS,y} = \phi \cdot (1-f) \cdot GWP_{CH4} \cdot \frac{16}{12} \cdot F \cdot DOC_i \cdot MCF \cdot \sum_{x=1}^y W_{j,x} \cdot DOC_j \cdot e^{-k_j \cdot (y-x)} \cdot (1-e^{-k_i})$	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
iii. Explanation and justification for all relevant methodological choices, including different scenarios or cases, options and default values	EB 41	Ann 12	OX = value 0.1 applied as recommended by the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site. (Version 05.1.0)” was verified by site visit observations for all landfill installations and BVC deems all sites as “managed solid waste disposal sites that are covered with soil” Where f = Fraction of methane captured at the SWDS and flared, combusted, or used in another manner; to meet the relevant regulations or contractual requirements is zero as explained above value applied is 0 MCF =1.0 Methane correction factor is value 1.0 IPCC 2006 Guidelines for National Greenhouse Gas Inventories for anaerobic managed solid waste disposal sites. During site visit it was observed for all sites to have controlled placement of waste (i.e. waste directed to specific deposition areas, with a degree of control of scavenging and a degree of control of fires) and all sites were utilizing the following: (i) cover material; (ii) mechanical compacting; or (iii) leveling of the waste DOC_f = 0.5 Fraction of degradable organic carbon (DOC) that can decompose derived from IPCC 2006 Guidelines for National Greenhouse Gas Inventories as default value from “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site. (Version 05.1.0)” F = 0.5 in accordance to “Tool to determine methane emissions		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			avoided from disposal of waste at a solid waste disposal site. (Version 05.1.0)" value in Fraction of methane in the SWDS gas (volume fraction) (0.5) X = the first year of landfill operation (x=1) to the year for which emissions are calculated (x=y)]; In the tool x will refer to the year since the landfill started receiving wastes By site visit interviews and reviews of EIA reports with Landfill operators it is provided in "Joburg LF BE CER v4 03 02 2011" x; Enerdale x = 1988 Robinson Deep x = 1936 Goudkoppies x = 1989 Marie Louise x = 1991 Linbro Park x = 1969 With reference to section B.6.1 of PDD version 8 dated 17/04/2012, adequate explanation is provided in the explanation and justification of all relevant methodological choices cover ACM0001 e.g. - There is no regulation/contract for destruction of methane from the landfill in the baseline, confirmed in site visit and interviews, hence MDBL_y is zero - The efficiency of the degassing system and applicable tools; Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site GEF - Tool to calculate the emission factor for an electricity system		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			• Step method applied • Method applied to calculate OM • Option applied to calculate OM • Sample applied to determine BM • Weighting of operating margin emission factor and Weighting of build margin emission factor is done as per the tool Tool to calculate baseline, project and/or leakage emissions from electricity consumption Tool to calculate project or leakage CO2 emissions from fossil fuel combustion • Where the Option A1 of cross-referenced tool is applied • To determine Project or leakage emissions is per option B3 is applied • The CO2 emission factor of the fuel type used is calculated using Option B of the tool Tool to determine project emissions from flaring gases containing methane, • Out of two options are available to determine flare efficiency. Option a) will be chosen, as the Project uses enclosed flares = 90% default value.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
q. In CDM-PDD section B.6.2 are following provided?	EB 41	Ann 12			
i. A compilation of information on the data and parameters that are not monitored throughout the crediting period but that are determined only once and thus remains fixed throughout the crediting period and that are available when validation is undertaken	EB 41	Ann 12	Compilation of information on the data and parameters that are not monitored throughout the first 7 year crediting period is provided		OK
ii. The actual value applied	EB 41	Ann 12	GWP_{CH_4} = value 21 tCO₂e as per IPCC D_{CH_4} = 0.0007168 tCH₄/m³ as per ACM0001 $BE_{CH_4,SWDS,y}$ = ex ante estimates 484,966tCO₂e (annual average over 1st crediting period) $CE_{elec,BL,y} / EF_{EL,j,y}$ = calculated from the tool to calculate emission factor for an electricity system value 0.977 tCO₂e/Mwh $FC_{i,m,y}$ = Amount of fossil fuel type <i>i</i> consumed by the group of power units <i>m</i> in year <i>y</i> value annex 3 $NCV_{i,y}$ Net calorific value (energy content) of fossil fuel type <i>i</i> in year <i>y</i> as per IPCC 2006 Guidelines for National Greenhouse Gas Inventories annex 3 $EF_{CO_2,i,y}$ CO₂ emission factor of fossil fuel type <i>i</i> in year <i>y</i> annex 3 $EG_{m,y}$ = Net electricity generated and delivered to the grid by power plant / unit <i>m</i> in year <i>y</i> reviewed from Eskom (South African electricity supply company) NERSA (National Electricity Regulator South Africa), latest Electricity Supply Statistics		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Φ = 0.9 Model correction factor to account for model uncertainties this value is default as per the tool OX = 0.1 Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste) default as per tool F = 0.5 (Fraction of methane in the SWDS gas (volume fraction) Default value from the “<i>Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site</i>” Version 05.1.0, adopted at EB 61. DOC_f = 0.5 Default value as defined in the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site” Version 05.1.0, adopted at EB 61. MCF = 1.0 verified by confirmation at site visit that landfills in proposed project fulfill the requirement of default value as defined in the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”, Version 05.1.0, adopted at EB 61 (for a site with controlled placement of waste, cover material, and leveling of the waste) was used. DOC_j = IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Tables 2.4 and 2.5). In accordance with the “<i>Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site</i>”,		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl														
			<table><tr><th>Waste type <i>j</i></th><th>DOC_{<i>j</i>} (% wet waste)</th></tr><tr><td>Wood and wood products</td><td>43</td></tr><tr><td>Pulp, paper and cardboard (other than sludge)</td><td>40</td></tr><tr><td>Food, food waste, beverages and tobacco (other than sludge)</td><td>15</td></tr><tr><td>Textiles</td><td>24</td></tr><tr><td>Garden, yard and park waste</td><td>20</td></tr><tr><td>Glass, plastic, metal, other inert waste</td><td>0</td></tr></table> k_j = Decay rate for the waste type <i>j</i> based upon IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Table 3.3). The values applied are for Boreal & temperate (MAT < 20°C) and dry (MAP < 1,000mm) conditions and referenced from climate data for Johannesburg from the South African Weather Service f =0 value is adjusted in line with recommendation from ACM0001 on basis of prior consideration of adjustment factor in ACM0001 where it is agreed that adjustment factor is zero based on interviews with landfill operator at site visit and observation of all five landfill installations and review of existing South African “Minimum Regulations for Landfills” W_x = Total amount of organic waste in year x (tonnes) is provided in “Joburg LF BE CER” worksheet on yearly basis, by interviews with Landfill operators the values are deemed reasonable total waste from x=1 at all sites Linbro park 6,559, 003 Marie Louise 5,916,436	Waste type <i>j</i>	DOC _{<i>j</i>} (% wet waste)	Wood and wood products	43	Pulp, paper and cardboard (other than sludge)	40	Food, food waste, beverages and tobacco (other than sludge)	15	Textiles	24	Garden, yard and park waste	20	Glass, plastic, metal, other inert waste	0		
Waste type <i>j</i>	DOC _{<i>j</i>} (% wet waste)																		
Wood and wood products	43																		
Pulp, paper and cardboard (other than sludge)	40																		
Food, food waste, beverages and tobacco (other than sludge)	15																		
Textiles	24																		
Garden, yard and park waste	20																		
Glass, plastic, metal, other inert waste	0																		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Goudkoppies 18,230,052 Enerdale 4,070,729 Robinson Deep 19,907,110 $\eta_{\text{flare},h}$ = Flare efficiency in the hour h picked from Default value for enclosed flares as per “Tool to determine project emissions from flaring gases containing methane $\text{COEF}_{i,j}$ = CO₂ emission coefficient of fuel type i in year y from Calculated using Option B in the “Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion” therefore $\text{COEF}_{i,j} = \text{NCV}_{i,y} \times \text{EFCO}_{2,i,y} = 3.24 \text{ tCO}_2\text{e/mass or volume unit}$ $\text{NCV}_{i,y} = 0.0433 \text{ TJ/t}$ IPCC default values $\text{EFCO}_{2,i,y} = 74.8 \text{ tCO}_2/\text{TJ}$ Weighted average CO₂ emission factor of fuel type i in the year y Values are taken from IPCC (2006) for diesel $\text{TDL}_{j,y} = 8.0\%$ collaborated by sources from Eskom Annual Report 2008, by validation by crosscheck of other sources (e.g. http://www.nationmaster.com/graph/ene_ele_pow_tra_and_dis_loss_of_out-power-transmission-distribution-losses-output) indicate 6% as TDL and hence 8% is deemed conservative and reasonable		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
iii. Explanation and justification for the choice of the source of data	EB 41	Ann 12	Yes as explained above in ii		
iv. Clear and transparent references or additional documentation in Annex 3	EB 41	Ann 12	Yes verifiable sources are provided in Annex 3 of PDD		
v. Where values have been measured, a description of the measurement methods and procedures (e.g. which standards have been used), indicated the responsible person/entity having undertaken the measurement, the date of measurement(s) and the measurement results	EB 41	Ann 12	No values are measured, values are either sourced from default values from tool or deduced from studies e.g Growth Rates per Landfill Site from Air surveys: Defaults from tools and methodology Methane Density Estimated % CH ₄ in Biogas Anticipate Collection Efficiency Adjustment Factor Default Flare Efficiency		OK
r. In CDM-PDD section B.6.3 are following provided?	EB 41	Ann 12			
i. A transparent <i>ex ante</i> calculation of project emissions, baseline emissions (or, where applicable, direct calculation of emission reductions) and leakage emissions expected during the crediting period, applying all relevant equations provided in the approved methodology	EB 41	Ann 12	<i>ex ante</i> calculation of project emissions and baseline emissions are provided as follows; $BE_y = (MD_{project,y} - MD_{BL,y}) * GWP_{CH_4} + (EL_{LFG,y} * CEF_{elec,BL,y})$ $MD_{project,y} = MD_{flared,y} + MD_{electricity,y}$ with total of 159,947 tCH ₄ – table 1 of PDD compared to ex ante estimate as calculated from; $MD_{project,y} = BE_{CH_4,SWDS,y} / GWP_{CH_4} = 161,655 \text{ tCH}_4$		OK
ii. documentation how each equation is	EB 41	Ann	Formula to calculate project emissions is not clearly	CL 3	Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl																																																		
applied, in a manner that enables the reader to reproduce the calculation		12	depicted one component has ($PE_y = PE_{EC,y} + PE_{FC,,j,y}$) other component (eqn 15) to calculate Project emissions as provided in PDD is not easily reproducible																																																				
iii. Additional background information and or data in Annex 3, including relevant electronic files (i.e. spreadsheets)	EB 41	Ann 12	In annex 3 of PDD it is provided as snapshots on; -Baseline & Emission reduction calculations Baseline Emissions (First Crediting Period) all five landfill sites - Financial analysis and benchmark determination -Market return -Country risk premium -Grid Emission Factor of the South African Electricity Grid - Sources and Assumptions made for the grid emission calculation	Ok	OK																																																		
s. In CDM-PDD section B.6.4 are the results of the <i>ex ante</i> estimation of emission reductions for all years of the crediting period, provided in a tabular format?	EB 41	Ann 12	Table B.6.4.1: Total Emission Reductions over the first crediting period <table><tr><th>Year</th><th>Estimation of project activity emissions [tCO₂e]</th><th>Estimation of baseline emissions [tCO₂e]</th><th>Estimation of leakage [tCO₂e]</th><th>Estimation of overall emission reductions [tCO₂e]</th></tr><tr><td>2012 (Jun – Dec.)</td><td>2,967</td><td>260,566</td><td>0</td><td>257,599</td></tr><tr><td>2013</td><td>5,086</td><td>489,325</td><td>0</td><td>484,239</td></tr><tr><td>2014</td><td>5,086</td><td>532,996</td><td>0</td><td>527,910</td></tr><tr><td>2015</td><td>5,086</td><td>557,518</td><td>0</td><td>552,432</td></tr><tr><td>2016</td><td>5,086</td><td>570,748</td><td>0</td><td>565,662</td></tr><tr><td>2017</td><td>5,086</td><td>580,394</td><td>0</td><td>575,309</td></tr><tr><td>2018</td><td>5,086</td><td>590,674</td><td>0</td><td>585,588</td></tr><tr><td>2019 (Jan – May)</td><td>2,119</td><td>250,844</td><td>0</td><td>248,725</td></tr><tr><td>Total [tCO₂e]</td><td>35,601</td><td>3,833,066</td><td>0</td><td>3,797,465</td></tr></table>	Year	Estimation of project activity emissions [tCO ₂ e]	Estimation of baseline emissions [tCO ₂ e]	Estimation of leakage [tCO ₂ e]	Estimation of overall emission reductions [tCO ₂ e]	2012 (Jun – Dec.)	2,967	260,566	0	257,599	2013	5,086	489,325	0	484,239	2014	5,086	532,996	0	527,910	2015	5,086	557,518	0	552,432	2016	5,086	570,748	0	565,662	2017	5,086	580,394	0	575,309	2018	5,086	590,674	0	585,588	2019 (Jan – May)	2,119	250,844	0	248,725	Total [tCO ₂ e]	35,601	3,833,066	0	3,797,465	Ok	OK
Year	Estimation of project activity emissions [tCO ₂ e]	Estimation of baseline emissions [tCO ₂ e]	Estimation of leakage [tCO ₂ e]	Estimation of overall emission reductions [tCO ₂ e]																																																			
2012 (Jun – Dec.)	2,967	260,566	0	257,599																																																			
2013	5,086	489,325	0	484,239																																																			
2014	5,086	532,996	0	527,910																																																			
2015	5,086	557,518	0	552,432																																																			
2016	5,086	570,748	0	565,662																																																			
2017	5,086	580,394	0	575,309																																																			
2018	5,086	590,674	0	585,588																																																			
2019 (Jan – May)	2,119	250,844	0	248,725																																																			
Total [tCO ₂ e]	35,601	3,833,066	0	3,797,465																																																			
t. In CDM-PDD section B.7.1 are following provided?	EB 41	Ann 12																																																					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. Specific information on how the data and parameters that need to be monitored would actually be collected during monitoring for the project activity	EB 41	Ann 12	Yes provided in B.7.1 Specifically these are Data collection and record keeping arrangements Data Quality Control and Quality Assurance Maintenance and Calibration of monitoring equipment Staff training CDM monitoring organisation and management	Ok	OK
ii. For each parameter the following below information, using the table provided:	EB 41	Ann 12			
a. The source(s) of data that will be actually used for the proposed project activity (e.g. which exact national statistics). Where several sources may be used, explain and justify which data sources should be preferred.	EB 41	Ann 12	According to; “Tool to determine project emissions from flaring gases containing methane” Project participants should document in the CDM-PDD, which type of flare and which approach to determine the flare efficiency is used. In case of use of the default value for the methane destruction efficiency, the <u>manufacturer’s specifications for the operation of the flare and the required data and procedures to monitor these specifications</u> should be documented in the CDM-PDD – This is not documented in PDD please provide	CAR 5	Ok
b. Where data or parameters are supposed to be measured, specify the measurement methods and procedures, including a specification which accepted industry standards or national or international standards will be	EB 41	Ann 12	As per Some data parameters (from applicable tools) are not captured in section B.7.1 Accuracy and technical specifications for metering equipment is not clear	CAR 6	Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person/entity that should undertake the measurements and what is the measurement interval; (i) A description of the QA/QC procedures (if any) that should be applied; (ii) Where relevant: any further comment. Provide any relevant further background documentation in Annex 4.					
u. In CDM-PDD section B.7.2 are following provided?	EB 41	Ann 12			
i. A detailed description of the monitoring plan	EB 41	Ann 12	Provided in Annex 4 pertinent comments are provided in below section		
ii. The operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects generated by the project activity	EB 41	Ann 12	Organization / management structures are not provided	CAR 7	Ok
iii. The responsibilities for and institutional arrangements for data collection and archiving	EB 41	Ann 12	Responsibles for data collection and archiving are not provided	CAR 8	Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
iv. Indication that the monitoring plan reflect good monitoring practice appropriate to the type of project activity	EB 41	Ann 12	Monitoring plan is silent on Process monitoring Responsibilities Equipment maintenance besides calibration Calibration plan is not complete Illustration of monitoring process is not provided	CAR 9	Ok
v. Relevant further background information in Annex 4	EB 41	Ann 12	It is not clear from annex 4 whether the cited procedures have been established, Further only CDM procedures have been discussed other aspects of monitoring are missing	CAR 10	Ok
v. In CDM-PDD section B.8 are following provided?	EB 41	Ann 12			
i. Date of completion of the application of the methodology to the project activity study in DD/MM/YYYY	EB 41	Ann 12	Date of completion of the application of the methodology to the project activity study is not provided in DD/MM/YYYY	CAR 11	Ok
ii. Contact information of the person(s)/entity(ies) responsible for the application of the baseline and monitoring methodology to the project activity	EB 41	Ann 12	Full contact information is not provided in B.8	CL 4	Ok
iii. Indication if the person/entity is also a project participant listed in Annex 1	EB 41	Ann 12	In section B.8 Indication as to whether EcoSecurities Group Ltd is also a project participant is not provided (Ref PDD Guidance)	CAR 12	Ok
w. In CDM-PDD section C.1.1 are following provided?	EB 41	Ann 12			
i. The starting date of a CDM project activity, which is the earliest of the date(s) on which the implementation or	EB 41	Ann 12	The starting date of a CDM project activity, which is the earliest of the date(s) on which the implementation or construction or real action of a project activity begun	Ok	

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
construction or real action of a project activity begins/has begun (EB33, Para 76/CDM Glossary of terms/EB41, Para 67)			is 29 May 2009 (refer Purchase Order of Landfill Gas to Energy Generator)		
ii. A description of how this start date has been determined, and a description of the evidence available to support this start date	EB 41	Ann 12	Purchase Order of Landfill Gas to Energy Generator Refer "090529 - PO Generators" dated 29 May 2009 for 16 generators of 1.15MW, 3 generators of 500KW and 1 generator of 375KW	Ok	OK
iii. If this starting date is earlier than the date of publication of the CDM-PDD for global stakeholder consultation by a DOE, description in Section B.5 how the benefits of the CDM were seriously considered prior to the starting date	EB 41	Ann 12	Yes, Chronology is provided in PDD And consideration for prior consideration was necessary as starting date (29 May 2009) is earlier than the date of publication of the CDM-PDD for global stakeholder consultation - Newspaper excerpt of Tender Notice published by City of Johannesburg Metropolitan Municipality to develop five sites under the CDM Dated 23/04/2007. - The tender notice mentions that the Johannesburg municipality, owner of the sites, is interested in developing the project under CDM. - Original ERPA signed between the project developer and EcoSecurities dated 10/07/2008 The signing of ERPA before the start date of the project activity demonstrates prior consideration of CDM by the Project Developer. - Final Lease & Gas Rights Agreement Signed by the Project Developer and the Municipality of Johannesburg to develop the proposed project under CDM 27/05/2009 which was confirmed as that	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Project Developer will enter into ERPA for the sale and purchase of CERs related to the project with EcoSecurities. • Purchase order for Generators dated 29/05/2009 is representative of Start date CDM Project • Submittal EIA and EMP scoping reports in September 2009 EIA included a stakeholder consultation • Notification of CDM consideration sent to UNFCCC and DNA dated 20/11/2009 within 6 months after signing Agreement with the Municipality.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
x. In CDM-PDD section C.1.2 is the expected operational lifetime of the project activity in years and months provided?	EB 41	Ann 12	Operational lifetime of the project is Up to 20 years Operational life time is not provided in years and months	CAR 13	Ok
y. In CDM-PDD section C.2 is it stated whether the project activity will use a renewable or a fixed crediting period and is C.2.1 or C.2.2 completed accordingly?	EB 41	Ann 12	Renewable crediting period is chosen as 7*3 years	Ok	OK
z. In CDM-PDD section C.2.1 is it indicated that each crediting period shall be at most 7 years and may be renewed at most two times, provided that, for each renewal, a designated operational entity determines and informs the Executive Board that the original project baseline is still valid or has been updated taking account of new data where applicable?	EB 41	Ann 12	Yes PP have indicated that each crediting period shall be at most 7 years and 21 years overall each crediting period will be renewable twice	Ok	OK
aa. In CDM-PDD section C.2.1.1 are dates in the following format: (DD/MM/YYYY) provided?	EB 41	Ann 12	The crediting period will start on 01/06/2012, or on the date of registration of the CDM project activity, whichever is later		OK
bb. In CDM-PDD section C.2.1.2 is the length of the first crediting period in years and months provided?	EB 41	Ann 12	length of the first crediting period is 7 years crediting period has not been provided in years and months	CAR 14	Ok
cc. In CDM-PDD section C.2.2 is the fixed crediting period at most ten (10) years provided?	EB 41	Ann 12	N/A		
dd. In CDM-PDD section C.2.2.1 are the dates provided in the following format: (DD/MM/YYYY)?	EB 41	Ann 12	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ee. In CDM-PDD section C.2.2.2 is the length of the crediting period in years and months Provided?	EB 41	Ann 12	N/A		
ff. In CDM-PDD section D.2 are the conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the Host Party, if environmental impacts are considered significant by the project participants or the Host, provided?	EB 41	Ann 12	The NEMA is South Africa's environmental legislation to provide for co-operative governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by refer (Government Gazette, 1998). An EIA must be undertaken in accordance EIA Regulations of the NEMA. These regulations came into effect on the 3rd of July 2006 and all EIA processes and applications need to be undertaken in accordance with these regulations. The DEAT is the lead Authority. The EIA regulations under the NEMA envisage two categories of activities: Schedule 1 and Schedule 2 activities are those that will require both Scoping and an EIA. The project requires a full EIA process will be undertaken. This process involves the following phases: ■ Submission of an EIA Application Authorisation (submitted on 30 March 2009), Reference Number 12/12/20/1472; ■ Compilation and submission of a Scoping Report (submitted on 5 June 2009), which included a Plan of Study for the EIA	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			■ Public Participation Process (PPP) (undertaken for the duration of the project); and ● A comprehensive EIA Report and a Draft Environmental Management Plan (EMP). Having reviewed conclusions and all references to support documentation of an environmental impact assessment undertaken in the five scoping reports initial Scoping Report for the proposed Landfill Gas Utilisation Plant in Ennerdale, Goudkoppies, Linbro Park, Marie Louise and Robinson Deep were carried out in June 2009, and submitted to Environment and Tourism dept refer ref “Acknowledgement of receipt of the scoping repots and plan of study for EIA for the proposed construction of gas utilization project in the Gauteng province” dated 22 June 2009. Each proposed site has subsequently prepared an Environmental Management Plan for all five sites e.g. for Ener-G Systems Joburg (Pty) Ltd e.g. Ennerdale EMP dated September 2009		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
gg. In CDM-PDD section E.1 are the following provided?	EB 41	Ann 12			
i. The process by which comments by local stakeholders have been invited and compiled. An invitation for comments by local stakeholders shall be made in an open and transparent manner, in a way that facilitates comments to be received from local stakeholders and allows for a reasonable time for comments to be submitted.	EB 41	Ann 12	The NEMA EIA Regulations require that a site notice available to the public at the site where the proposed project activity a photo of the notices placed in strategic locations were available at site visit: The purpose of the site notices was to notify the public of the project and to invite Stakeholder and I&APs to register or attend the Public Meeting. Refer “App C_Site Notice Ennerdale” for a copy of the site notices NEMA EIA Regulations require that an advertisement be placed in either a local newspaper or a Government Gazette. Should the project have a potential impact that extends beyond the boundaries of the metropolitan or local municipality, the project should be advertised within at least one provincial or national newspaper. For the proposed project WSP placed an advertisement in a national newspaper. Refer to “App E_Citizen newspaper advertisement” for a copy of the newspaper advertisement placed in the Citizen on: 19 February 2009	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			A Public Meeting was held before the Authorities meeting at the Ennerdale Civic Centre on the 27th February 2009 from 17h00 to 18h00. The aim of the Authorities meeting and the Public Meeting was to outline the details of the project and provide an opportunity for the Authorities, stakeholders and I&APs to raise issues, concerns and queries related to the project. Furthermore, they established a line of communication between the Authorities, stakeholders, I&APs and the project team. Please refer to “App G_AppB Public Meeting Attendance Register” for the attendance register and meeting minutes from the Public and Authorities meeting.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. The project activity is described in a manner, which allows the local stakeholders to understand the project activity, taking into account confidentiality provisions of the CDM modalities and procedures.	EB 41	Ann 12	Methodology used was described in a manner that allows stakeholders to understand the project activity For the proposed project WSP (consultant) placed an advertisement in a national newspaper. Refer to “App E_Citizen newspaper advertisement” for a copy of the newspaper advertisement placed in the Citizen on: 19 February 2009 A Public Meeting was held before the Authorities meeting at the Ennerdale Civic Centre on the 27th February 2009 from 17h00 to 18h00. The aim of the Authorities meeting and the Public Meeting was to outline the details of the project and provide an opportunity for the Authorities, stakeholders and I&APs to raise issues, concerns and queries related to the project. Furthermore, they established a line of communication between the Authorities, stakeholders, I&APs and the project team. Please refer to “App G_AppB Public Meeting Attendance Register” for the attendance register and meeting minutes from the Public and Authorities meeting.	Ok	OK
iii. The local stakeholder process has been completed before submitting the proposed project activity to the DOE for validation.	EB 41	Ann 12	Yes, the LSC was completed end of May 2009		OK
hh. In CDM-PDD section E.2 are following provided?	EB 41	Ann 12			

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. Identification of local stakeholders that have made comments	EB 41	Ann 12	Identification of stakeholders that have made the comments is not provided	CAR 15	OK
ii. A summary of this comments.	EB 41	Ann 12	A summary of comments that were made by local stakeholders is not provided in E.2	CAR 16	OK
ii. In CDM-PDD section E.3 is the explanation of how due account have been taken of comments received from local stakeholders provided?	EB 41	Ann 12	PDD section E.3 provides an account of some comments from local stakeholders e.g. Air quality, Possibilities for office blocks and housing And Employment however how comments/queries in scoping report e.g. Enerdale as regards Capping of the site, effect on surface/groundwater, the technical operation of the proposed plant have not been included in PDD	CL 5	Ok
jj. In CDM-PDD Annex 1 are the following provided?	EB 41	Ann 12			
i. Contact information of project participants	EB 41	Ann 12	Provided in Annex 1	Ok	OK
ii. For each organisation listed in section A.3 the following mandatory fields: Organization, Name of contact person, Street, City, Postfix/ZIP, Country, Telephone and Fax or e-mail	EB 41	Ann 12	Complete information in the correct format and location is provided for both the PPs	Ok	OK
kk. In CDM-PDD Annex 2 is information from Parties included in Annex I on sources of public funding for the project activity which shall provide an affirmation that such funding does not result in a diversion of official development	EB 41	Ann 12	Affirmation that the project will not receive any public funding from an Annex 1 country is provided	Ok	OK

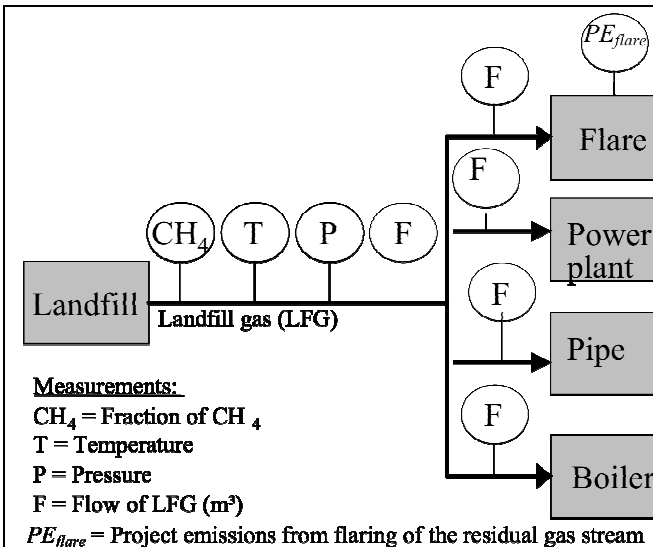
CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
assistance and is separate from and is not counted towards the financial obligations of those Parties provided?					
II. In CDM-PDD Annex 3 is the background information used in the application of the baseline methodology provided?	EB 41	Ann 12	In annex 3 of PDD it is provided as snapshots on; -Baseline & Emission reduction calculations Baseline Emissions (First Crediting Period) all five landfill sites - Financial analysis and benchmark determination -Market return -Country risk premium -Grid Emission Factor of the South African Electricity Grid - Sources and Assumptions made for the grid emission calculation Which are used in application of the baseline methodology	Ok	OK
mm. In CDM-PDD Annex 4 is the background information used in the application of the monitoring methodology provided?	EB 41	Ann 12	Yes, background information used in the application of the monitoring methodology is provided in Table: CDM Monitoring System Procedures	Ok	OK
4. Project description					
a. Does the PDD contain a clear description of the project activity that provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation?	VVM	58	The objective of the project is to collect and destruct/utilize the landfill gas (LFG) generated at the Johannesburg landfill sites. 1. In the first stage, LFG will be captured and destroyed by using a LFG flare 2. LFG will be fired the LFG flare to generate electricity Excess LFG, will be flared.	OK	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
b. Is the description of the proposed CDM project activity as contained in the PDD:	VVM	59			
i. sufficiently covering all relevant elements?	VVM	59	The purpose, scenario existing prior to project, project scenario and baseline scenario have been described in A.2	Ok	OK
ii. accurate?	VVM	59	Confirmation of write up was confirmed in site visit done between 4 th – 6 th October 2010	Ok	OK
iii. providing the reader with a clear understanding of the nature of the proposed CDM project activity?	VVM	59	The objective of the project is to collect and destruct/utilize the landfill gas (LFG) generated at five Johannesburg landfill sites. 1. In the first stage, LFG will be captured and destroyed by using a LFG flare 2. LFG will be fired the LFG flare to generate electricity Excess LFG, will be flared.	Ok	OK
iv. Are there any changes/modifications compared to the webhosted PDD?	VVM	59	There were no changes as compared to webhosted PDD	Ok	OK
c. Is the proposed CDM project activity in existing facilities or or utilizing existing equipments?	VVM	60	No, The project is a green field project, at site visit it was observed that there were no other installations at the proposed locations of the project	Ok	OK
d. Is the CDM project activity one of the following types:	VVM	60		Ok	OK
i. Large scale?	VVM	60	Yes, Large scale project with estimated emission average reductions of 542,495 tCO ₂ e annual average emission reductions over the first crediting period	Ok	OK
ii. Non-bundled small scale projects with emission reductions exceeding 15,000 tonnes per year?	VVM	60	N/A		
iii. Bundled small scale projects, each with emission reductions not exceeding 15,000 tonnes?	VVM	60	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
e. If yes to (c) and (d) above, was a physical site inspection conducted to confirm that the description in the PDD reflects the proposed CDM project activity, unless other means are specified in the methodology?	VVM	60	Site visit was carried out on 4 th to 6 th October 2010 to confirm that the description in the PDD reflects the proposed CDM project activity,	Ok	OK
f. If yes to (d.iii) above, was the number of physical site visits base on sampling?	VVM	60	The proposed project is to be implemented at five sites all of which are within the Johannesburg Metropolitan. All five sites in the project were visited and therefore no sampling	Ok	OK
g. If yes is the sampling size appropriately justified through statistical analysis?	VVM	60	N/A		
h. For other individual proposed small scale CDM project activities with emission reductions not exceeding 15,000 tonnes per year, was a physical site inspection conducted?	VVM	61	N/A		
i. For all other proposed CDM project activities not referred to in VVM paragraphs 59 – 61, was a physical site inspection conducted?	VVM	62	N/A		
j. If no, was it appropriately justified?	VVM	62	N/A		
k. Does the proposed CDM project activity involve the alteration of an existing installation or process?	VVM	63	The project is a Greenfield project and does not involve the alteration of an existing installation or process	Ok	OK
l. If yes, does the project description clearly state the differences resulting from the project activity compared to the pre-project situation?	VVM	63	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
5. Baseline and monitoring methodology					
a. General requirement					
a. Do the the baseline and monitoring methodologies selected by the project participants comply with the methodologies previously approved by the CDM Executive Board?	VVM	65	The large scale methodology ACM0001 Version 11, adopted at EB47, "Consolidated baseline and monitoring methodology for landfill gas project activities" has been used in the project activity	OK	
b. Is the selected methodology applicable to the project activity?	VVM	66	Refer to (5.b.a) below	-	-
c. Had the PP correctly applied the selected methodology?	VVM	66	Refer to (5.b.d) below	-	-
d. Had the selected methodology been correctly applied with respect to project boundary?	VVM	67	Refer to (5.c) below	-	-
e. Had the selected methodology been correctly applied with respect to baseline identification?	VVM	67	Refer to (5.d) below	-	-
f. Had the selected methodology been correctly applied with respect to Algorithms and/or formulae used to determine emission reductions?	VVM	67	Refer to (5.e) below	-	-
g. Had the selected methodology been correctly applied with respect to additionality?	VVM	67			
i. Has the latest version of the "Tool for the demonstration and assessment of additionality" been used ?	ACM	0001	The latest version of the "Tool for the demonstration and assessment of additionality", has not been applied		OK
ii. If the "Combined tool to identify the			Pending CAR 4		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
baseline scenario and demonstrate additionality" is used for the selection of the most plausible baseline scenario, has this same tool been used for the demonstration of additionality?					
h. Had the selected methodology been correctly applied with respect to monitoring methodology?	VVM	67			
i. Is the monitoring methodology based on direct measurement of the amount of landfill gas captured and destroyed at the flare platform(s), the natural gas pipelines and the electricity generating/thermal energy unit(s) to determine the quantities as shown in Figure 1 of the methodology ?	ACM	0001	Yes, T: Flow meters will express LFG volumes in normalised cubic meters, P: Flow meters will express LFG volumes in normalised cubic meters Hence project will use calibrated meters to determine LFG_{total,y} over the first crediting period it is estimated ex ante as 64,435,323 (annual average) 1) Methane fraction 50% collection efficiency is informed by a Due diligence report on the landfill site potential that identifies the reason for the gas collection efficiency used for each site and was conducted by Golder Associates, the value is used to determine ex ante emissions only, ex post emission reductions will have a continuous monitored value of LFG. 50% is deemed reasonable 2) Flowmeter for individual units Design of project requires installation of flow meters to be maintained and calibrated regularly. The flow meter will express gas flow in normalised cubic meters, therefore no separate monitoring of pressure (P) and temperature (T) of LFG is necessary.		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
 Measurements: CH_4 = Fraction of CH_4 T = Temperature P = Pressure F = Flow of LFG (m^3) PE_{flare} = Project emissions from flaring of the residual gas stream Figure 1: Monitoring Plan			3) PE_{flare} Is determined as $TM_{RG,h} * Annual_Op_Hrs * (1 - Default_Flare_eff) * GWP_CH4 / 1000$ Where $TM_{RG,h}$ = Mass flow rate of methane in the residual gas in the hour h, considering that annual operating hours is conservatively selected to include maintenance and skills from other similar projects by Ener-G, and Default flare efficiency of 90% as per option a of the “Tool to determine project emissions from flaring gases containing methane” – (project is designed to use enclosed flares) the value 5,124 estimated for the first crediting period is deemed reasonable		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
<i>b. Applicability of the selected methodology to the project activity</i>					
a. Is the selected baseline and monitoring methodology, previously approved by the CDM Executive Board, applicable to the project activity, including that the used version valid?	VVM	68	The large scale methodology ACM0001 Version 11, adopted at EB47, "Consolidated baseline and monitoring methodology for landfill gas project activities" is previously approved by the CDM Executive Board and applicable to the project activity, including that the used version 11	Ok	OK
i. Is the project activity landfill gas capture, where the baseline scenario is the partial or total atmospheric release of the gas?	ACM	0001	Yes, the baseline scenario is total atmospheric release of LFG. Project activity is Methane collection and destruction: The collection and destruction (through flaring) thus converting its methane content into CO ₂ , reducing its greenhouse gas effect; and Electricity displacement: by utilization of LFG (through combustion in electricity generation units), and supply of electricity to the grid/or a local power purchaser, thus displacing a certain amount of fossil fuels that are used for electricity generation for the national grid.	Ok	OK
b. Is the methodology correctly quoted?	VVM	69	Yes "Consolidated baseline and monitoring methodology for landfill gas project activities"	Ok	OK
c. Are the applicability conditions of the methodology met?	VVM	70	Yes, Applicability conditions (a) and (b) are met as discussed below		
i. Does the project activity include situations such as :	ACM	0001			
a. The captured gas is flared; and/or	ACM	0001	Yes, captured LFG is flared	Ok	OK
b. The captured gas is used to produce energy (e.g.	ACM	0001	Yes, Electricity displacement: by utilization of LFG (through combustion in electricity generation units),	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
electricity/thermal energy). Emission reductions can be claimed for thermal energy generation, only if the LFG displaces use of fossil fuel either in a boiler or in an air heater. For claiming emission reductions for other thermal energy equipment (e.g. kiln), project proponents may submit a revision to this methodology			and supply of electricity to the grid/or a local power purchaser, thus displacing a certain amount of fossil fuels that are used for electricity generation for the national grid.		
c. The captured gas is used to supply consumers through natural gas distribution network. If emissions reductions are claimed for displacing natural gas, project activities may use approved methodology AM0053 ?	ACM	0001	Not applicable to the project, no indication through project designs, technology description including interview with PP's of supplying captured gas to consumers through natural gas distribution network.	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
d. Is the project activity expected to result in emissions other than those allowed by the methodology?	VVM	70	No	Ok	OK
e. Is the choice of the methodology justified?	VVM	70	Yes, the choice of the methodology justified and meets applicability conditions for (a) and (b) of methodology	Ok	OK
f. Have the project participants shown that the project activity meets each of the applicability conditions or the approved methodology?	VVM	70	Refer to (5.b.c) above	-	-
g. Have the project participants shown that the project activity meets each of the applicability conditions of any tool or other methodology component referred to the methodology?	VVM	70	As below;		
i. For the "Tool to determine project emissions from flaring gases containing methane":	EB28	Anx 13			
a. The residual gas stream to be flared contains no other combustible gases than methane, carbon monoxide and hydrogen	EB28	Anx 13	The residual gas stream (LFG) to be flared contains no other combustible gases than methane, carbon monoxide and hydrogen.	Ok	OK
b. The residual gas stream to be flared shall be obtained from decomposition of organic material (through landfills, bio-digesters or anaerobic lagoons, among others) or from gases vented in coal mines (coal mine methane and coal bed methane)?	EB28	Anx 13	The residual gas steam to be flared is obtained from the decomposition of organic material from the landfills.	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. For the “Tool to calculate project emissions from electricity consumption”:	EB32	Anx 10	Not used as that $CEF_{elec,BL,y} = EF_{EL,j,y}$	Ok	
a. This tool is not applicable in cases where captive renewable power generation technologies installed at the project site supply the electricity consumed by the project activity?	EB32	Anx 10	N/A		
iii. For the “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion”:	EB28	Anx 14			
a. Are CO2 emissions from fossil fuel combustion calculated based on the quantity of fuel combusted and its properties?	EB28	Anx 14	When Project burns fossil fuel (in an on-site fossil fuel generator) the CO ₂ emissions from the fossil fuel combustion will be based on the quantity of the fuel combusted and its properties	Ok	OK
iv. For the “Combined tool to identify the baseline scenario and demonstrate additionality”:	EB28	Anx 14			
a. Are all potential alternative scenarios to the proposed project activity available options to project participants?	EB28	Anx 14	N/A		
v. For the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”:	EB41	Anx 10			
a. Can the solid waste disposal site where the waste would be dumped be clearly identified ?	EB41	Anx 10	The solid waste disposal site where the waste was/is dumped was clearly identified		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
b. Is the project not a stockpile, as the tool is not applicable to stockpiles?	EB41	Anx 10	Applicability conditions relating to stockpiles are not provided	CL 6	Ok
c. Is the project not including hazardous waste, as the tool is not applicable to hazardous waste?	EB41	Anx 10	The project does not consider hazardous wastes, hence applicability still applies, during site visit the team interviewed the landfill operator – “Pickit up” who confirmed that hazardous wastes are not allowed for disposal at any of the landfill sites		Ok
vi. For the “Tool to calculate the emission factor for an electricity system”:	EB50	Anx 14	Applicability conditions relating to “Tool to calculate the emission factor for an electricity system”: is not provided Methodology provides that the tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity, this is provided on page 8 of PDD	CL 7	Ok
a. Does the project activity substitute grid electricity?	EB50	Anx 14	Yes, Engines will be installed at proposed project, electricity will be generated and evacuated to the grid, hence displacing grid electricity	Ok	OK
b. In the case of off-grid power plants, are the conditions specified in Annex 2 of the tool - Procedures related to off-grid power generation met? Namely, are the total capacity of off-grid power plants (in MW) at least 10%	EB50	Anx 14	The consideration of off-grid power in determination of CM is optional. PP has chosen to ignore off-grid power		Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
contd c. of the total capacity of grid power plants in the electricity system; or is the total power generation by off-grid power plants (in MWh) at least 10% of the total power generation by grid power plants in the electricity system; and are that factors which negatively affect the reliability and stability of the grid primarily due to constraints in generation and not to other aspects such as transmission capacity?					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
h. Is the DOE, based on local and sectoral knowledge, aware that comparable information is available from sources other than that used in the PDD?	VVM	70	Yes, for power generation DOE has referred other sources e.g. www.eskom.co.za/, www.erc.uct.ac.za/, For Environmental analysis, DOE used a team member from South Africa Janene Jansen who is an Environmental Auditor with local expertise For LFG the team comprised a Landfill expert/consultant from Poland (Yuri Matveev)	Ok	OK
i. If yes, was the PDD cross checked against the other sources to confirm that the project activity meets the applicability conditions of the methodology? (provide the reference to these choices)	VVM	70	Yes, as referenced above	Ok	OK
j. Can a determination regarding the applicability of the selected methodology to the proposed CDM project activity be made?	VVM	71	Applicability of the selected methodology to the proposed CDM project activity is determined as suitable, as two applicability requirements in ACM0001 i.e. (a) The captured gas is flared; and/or (b) The captured gas is used to produce energy (e.g. electricity/thermal energy). Emission reductions can be claimed for thermal energy generation, only if the LFG displaces use of fossil fuel either in a boiler or in an air heater. For claiming emission reductions for other thermal energy equipment (e.g. kiln), project proponents may submit a revision to this methodology; The third applicability requirement (c) is not applicable to the proposed CDM project	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl																		
k. If no, clarification of the methodology was requested, in accordance with the guidance provided by the CDM Executive Board?	VVM	71	N/A																				
l. If answer to (5.b.c) above is “no”, revision or deviation from the methodology was requested, in accordance with the guidance provided by the CDM Executive Board?	VVM	72	N/A																				
m. If yes to (5.b.k) and (5.b.l) above, a request for registration was submitted before the CDM Executive Board has approved the proposed deviation or revision?	VVM	73	N/A																				
c. Project boundary																							
a. Does the PDD correctly describe the project boundary, including the physical delineation of the proposed CDM project activity included within the project boundary for the purpose of calculating project and baseline emissions for the proposed CDM project activity?	VVM	78	The proposed project comprises five sites <table><tr><th>Name of Site</th><th>Address</th><th>GPS Coordinates</th></tr><tr><td>Linbro Park</td><td>Marlboro Drive, Sandton</td><td>26° 05' 41.85" S 28° 07' 13.43" E</td></tr><tr><td>Marie Louise</td><td>Dobsonville Drive, Roodepoort</td><td>26° 11' 23.89" S 27° 53' 00.13" E</td></tr><tr><td>Robinson Deep</td><td>Turffontein Road, Turffontein</td><td>26° 13' 59.03" S 28° 02' 14.77" E</td></tr><tr><td>Goudkoppies</td><td>Houthammer Road, Devland, Lenasia</td><td>26° 16' 52.31" S 27° 55' 24.93" E</td></tr><tr><td>Ennerdale</td><td>Old Lawley Road, Lawley</td><td>26° 22' 07.78" S 27° 50' 02.80" E</td></tr></table> A flow diagram on page 10 of PDD provides the elements of the LFG collection systems and equipment for electricity generation refer - Figure B.3.1 - Flow diagram of Project set-up	Name of Site	Address	GPS Coordinates	Linbro Park	Marlboro Drive, Sandton	26° 05' 41.85" S 28° 07' 13.43" E	Marie Louise	Dobsonville Drive, Roodepoort	26° 11' 23.89" S 27° 53' 00.13" E	Robinson Deep	Turffontein Road, Turffontein	26° 13' 59.03" S 28° 02' 14.77" E	Goudkoppies	Houthammer Road, Devland, Lenasia	26° 16' 52.31" S 27° 55' 24.93" E	Ennerdale	Old Lawley Road, Lawley	26° 22' 07.78" S 27° 50' 02.80" E	Ok	OK
Name of Site	Address	GPS Coordinates																					
Linbro Park	Marlboro Drive, Sandton	26° 05' 41.85" S 28° 07' 13.43" E																					
Marie Louise	Dobsonville Drive, Roodepoort	26° 11' 23.89" S 27° 53' 00.13" E																					
Robinson Deep	Turffontein Road, Turffontein	26° 13' 59.03" S 28° 02' 14.77" E																					
Goudkoppies	Houthammer Road, Devland, Lenasia	26° 16' 52.31" S 27° 55' 24.93" E																					
Ennerdale	Old Lawley Road, Lawley	26° 22' 07.78" S 27° 50' 02.80" E																					
i. Is the project boundary the site of the project activity where the gas is captured and destroyed/used?	ACM	0001	Yes, LFG is captured and flared at project site (where the gas is captured and destroyed/used), the activity is correctly indicated in project boundary	Ok	OK																		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. If the electricity for project activity is sourced from grid or electricity generated by the LFG captured would have been generated by power generation sources connected to the grid, does the project boundary include all the power generation sources connected to the grid to which the project activity is connected?	ACM	0001	The electricity would have been sourced from a national grid hence the south Africa grid is included in the project boundary		Ok
iii. If the electricity for project activity is from a captive generation source or electricity generated by the captured LFG would have been generated by a captive power plant, is the captive power plant included in the project boundary?	ACM	0001	N/A	Ok	OK
b. Is the delineation in the PDD of the project boundary correct? a. Does the delineation of the project boundary include identification of all locations, processes and equipment including secondary equipment and associated processes such as logistics etc.	VVM	78	Project boundary includes all processes; main equipments; flaring and secondary processes such as on-site generator and project auxiliary consumption The definition and the result of the proposed CDM project are demonstrated in the section B.3 in PDD. Project boundary is clearly identified that includes the physical, geographical site of the project activity and all the plants connected physically to the South Africa National Grid where the Project is connected to.	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
c. Does the delineation in the PDD of the project boundary meet the requirements of the selected baseline? Have changes been made to the project boundary in comparison to the webhosted PDD.If yes please comment on the reason for the changes	VVM	78	Yes, the delineation in the PDD of the project boundary meet the requirements of the selected baseline There have not been any changes to the project boundary from webhosted PDD	Ok	
d. Have all sources and GHGs required by the methodology been included within the project boundary?	VVM	78	Yes. CO ₂ emissions by flaring of methane due to the project and CO ₂ emissions from on-site standby generator is taken into account, from sectoral expertiseand site visit it is established that all sources and GHGs required by the methodology been included within the project boundary	Ok	OK
e. Does the methodology allow project participant to choose whether a source or gas is to be included within the project boundary?	VVM	78	Yes, for CH ₄ , N ₂ O and CO ₂ CO ₂ The major source of emissions in the baseline and Electricity consumed from the grid or generated onsite/offsite in the baseline scenario is included are included in the baseline and project scenario whereby Emissions from decomposition of waste at the landfill site, Emissions from electricity consumption, On-site fossil fuel consumption due to the project activity other than for electricity generation and Emissions from on-site electricity use	Ok	OK
f. If yes, have the project participants justified that choice?	VVM	78	Yes, all inclusions and exclusions are justified and deemed reasonable	Ok	OK
g. If yes, is the justification provided reasonable? (provide reference to the	VVM	78	In all cases where methodology requires inclusion of a source / gas the PDD complies, and applies the	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
supporting documented evidence provided by the project participants)			exclusion of sources deemed by the methodology to be excluded for conservativeness		
Baseline identification					
a. Does the PDD identify the baseline for the proposed CDM project activity, defined as the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed CDM project activity?	VVM	81	The most plausible baseline scenario is the release of LFG to the atmosphere and generation of electricity in the fossil fuel based grid. There are no regulatory requirements that Landfill Gas to be collected or flared at the site. The proposed project activity is the installation of LFG capturing systems on a set of five landfills in the Johannesburg area where there are no existing systems to capture and destroy the LFG gas.	Ok	OK
b. Has any procedure contained in the methodology to identify the most reasonable baseline scenario, been correctly applied?	VVM	82	Yes, the methodology requires Project participants should use either; The latest version of the “Tool for the demonstration and assessment of additionality”, to identify all realistic and credible baseline alternatives or “Combined tool to identify the baseline scenario and demonstrate additionality” could be used. By applying the same methodology guidance provided The PP have correctly applied “Tool for the demonstration and assessment of additionality”,	Ok	OK
iv. Was the baseline identified through option b of the CDM modalities and procedures, i.e choosing emissions from a technology that represents an	ACM	0001			

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
economically attractive course of action, taking into account barriers to investment ?.					
Does the selected methodology require use of tools (such as the “Tool for the demonstration and assessment of additionality” and the “Combined tool to identify the baseline scenario and demonstrate additionality”) to establish the baseline scenario?	VVM	82	Yes, Tool for the demonstration and assessment of additionality is correctly applied	OK	OK
c. If yes, was the methodology consulted on the application of these tools? (In such cases, the guidance in the methodology shall supersede the tool.)	VVM	82	Yes, the methodology provides a guidance for application of the additionality steps 1 to 4 namely; Step 1: Identification of alternative scenarios- Project participants should use Step 1 of the latest version of the “Tool for the demonstration and assessment of additionality” Step 2: Identify the fuel for the baseline choice of energy source taking into account the national and/or sectoral policies as applicable Step 3: Step 2 and/or Step 3 of the latest approved version of the “Tool for demonstration and assessment of additionality” Step 4: Where more than one credible and plausible alternative remains, project participants shall, as conservative assumption, use the alternative baseline scenario that results in the lowest baseline emissions as the most likely baseline scenario.	Ok	OK
i. Step 1 : While using the “Tool for the demonstration and assessment of additionality » to identify all realistic and credible baseline alternatives, have	ACM	0001			

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
project participants taken into account :					
a. Local policies promoting productive use of landfill gas such as those for the production of renewable energy, or those that promote the processing of organic waste	ACM	0001	Yes draft 'Minimum Requirements for Waste Disposal by Landfill' (published in 2005 and constituting the most recent legislation on landfill site management available in South Africa) it does not categorically specify that it is a mandatory requirement to actively capture, flare, or destroy LFG at every landfill in South Africa. BVC agrees with this conclusion having reviewed supplied copy of requirements and accessing the same from local website including the regulatory requirements and website of NEMA. The said draft requirements provide guidelines to ensure safety on site (i.e. reducing the risk of explosions) by limiting LFG accumulation via passive ventilation	Ok	OK
b. Local economic and technological circumstances?	ACM	0001	Yes, The remaining options for plausible baseline alternatives for the Project activity are; LFG 2; P1 & P6 in determination of these outcomes, Local economic and technological circumstances are considered by PP	Ok	OK
ii. Have national and/or sectoral policies and circumstances been taken into account in the following ways :	ACM	0001			
a. In Sub-step 1b of the "Tool for the demonstration and assessment of additionality", the project developer must show that the project activity is not the only alternative that is in compliance with all regulations (e.g. because it is required by law)?	ACM	0001	LFG 2, P1 AND P6 comply with all regulations all possible scenarios described above comply with national and local regulations. There are no laws/regulations which specify that it is mandatory to destroy LFG at landfills in RSA		Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
b. Via the adjustment factor AF in the baseline emissions project participants must take into account that some of the methane generated in the baseline may be captured and destroyed to comply with regulations or contractual requirements?	ACM	0001	<i>MD_{BL,y}</i> is not applicable to the project hence AF does not apply, these will be reviewed in next crediting period		Ok
c. The project participants must monitor all relevant policies and circumstances at the beginning of each crediting period and adjust the baseline accordingly?	ACM	0001	PP shall monitor all relevant policies and circumstances annually and update the monitoring plan at the beginning of each crediting period and adjust the baseline accordingly		Ok
iii. Do alternatives for the disposal/treatment of the waste in the absence of the project activity, i.e. the scenario relevant for estimating baseline methane emissions, to be analysed include, inter alia: a. LFG1 : The project activity (i.e. capture of landfill gas and its flaring and/or its use) undertaken without being registered as a CDM project activity ? b. LFG2 : Atmospheric release of the landfill gas or partial capture of landfill gas and destruction to comply with regulations or contractual requirements, or to address safety and odour	ACM	0001	Alternatives for the disposal/treatment of the waste in the absence of the project activity, i.e. the scenario relevant for estimating baseline methane emissions, to be analysed include LFG 2: Atmospheric release of the landfill gas, which represents the business as usual scenario is the most plausible scenario	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
concerns ?					
iv. If LFG is used for generation of electric or heat energy for export to a grid and/or to a nearby industry or used on-site, were realistic and credible alternatives also separately determined for : a. Power generation in the absence of the project activity ? b. Heat generation in the absence of the project activity ?	ACM	0001	Option a is applicable	OK	OK
v. For power generation, the realistic and credible alternative(s) may include, inter alia : a. P1: Power generated from landfill gas undertaken without being registered as CDM project activity ? b. P2: Existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant ? c. P3: Existing or construction of a new on-site or off-site renewable based cogeneration plant ? d. P4: Existing or construction of a new on-site or off-site fossil fuel fired captive power plant ? e. P5: Existing or construction of a new on-site or off-site renewable based captive power plant ? f. P6: Existing and/or new grid-	ACM	0001	P1: Power generated from landfill gas undertaken without being registered as CDM project activity which represents the project activity. P1 also corresponds to LFG 1 and P6: Power plants connected to the grid are the most plausible scenario	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
connected power plants ?					
vi. For heat generation, the realistic and credible alternative(s) may include, inter alia : a. H1: Heat generated from landfill gas undertaken without being registered as CDM project activity ? b. H2: Existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant ? c. H3: Existing or construction of a new on-site or off-site renewable based cogeneration plant ? d. H4: Existing or new construction of on-site or off-site fossil fuel based boilers, air heaters or other heat generating equipment (e.g. kilns)? e. H5: Existing or new construction of on-site or off-site renewable energy based boilers, air heaters or other heat generating equipment (e.g. kilns)? f. H6: Any other source such as district heat; and? g. H7: Other heat generation technologies (e.g. heat pumps or solar energy).?	ACM	0001	N/A, Heat generation is not considered	Ok	OK
vii. Step 2 : Has the fuel for the baseline	ACM	0001	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
choice of energy source been identified, taking into account the national and/or Sectoral policies as applicable :					
a. Is it demonstrated that the identified baseline fuel is available in abundance in the host country and that there is no supply constraints?	ACM	0001	N/A		
b. In case of partial supply constraints (seasonal supply), have the project participants used the possibility to consider an alternative fuel that result in lowest baseline emissions during the period of partial supply ?	ACM	0001	N/A		
viii. Have steps 3 and 4 <u>of the methodology</u> below been applied for each component of the baseline, i.e. baseline for waste treatment, electricity generation and heat generation ?	ACM	0001	No, as the alternatives to the CDM project activity do not include investments of comparable scale to the project, then Option III is applied. The most likely alternative to the project is not to install flaring and generation equipment at the sites. Therefore, since no investments of a similar scale to the Project are involved, benchmark analysis is applied.		OK
ix. Step 3: Have Step 2 and/or Step 3 <u>of the latest approved version of the "Tool for demonstration and assessment of additionality"</u> been used to assess which of these alternatives should be excluded from further consideration (e.g. alternatives facing prohibitive barriers or those clearly economically unattractive)	ACM	0001	• P3. Existing or Construction of a new on-site or off-site renewable based cogeneration plant • P4. Existing or Construction of a new on-site or off-site fossil fuel fired captive power plant		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			- As there is no other renewable energy options available at the project sites, and these would be less plausible than purchasing electricity from the National Grid. Therefore option P5 is discarded. Since heat is not considered as part of the proposed project activity, cogeneration plants are not a viable alternative, and alternative P2 is discarded. - LFG1 is also discarded as not the most economically attractive course of action in the absence of project activity		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
x. Step 4: Where more than one credible and plausible alternative remains, have project participants, as a conservative assumption, used the alternative baseline scenario that results in the lowest baseline emissions as the most likely baseline scenario ? If yes :	ACM	0001	On analysing other activities similar to the proposed project activity there were no alternatives remaining		Ok
a. Was the least emission alternative identified for each component of the baseline scenario ?	ACM	0001	N/A		
b. In assessing these scenarios, were any regulatory or contractual requirements taken into consideration ?	ACM	0001	As discussed above there are no contractual or regulatory requirements in force	Ok	OK
xi. Is the resulting most plausible baseline scenario applicable to the methodology :	ACM	0001	Yes as it is the atmospheric release of landfill gas or landfill gas is partially captured and subsequently flared. The electricity is obtained from an existing/new fossil based captive power plant or from the grid	Ok	OK
a. Is the most plausible baseline scenario for the landfill gas identified as either the atmospheric release of landfill gas or landfill gas is partially captured and subsequently flared (LFG2) ?	ACM	0001	LFG 2: Atmospheric release of the landfill gas, which represents the business as usual scenario.	Ok	OK
b. Is the most plausible baseline scenario for the energy component of the baseline scenario one of the following	ACM	0001	No		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
scenarios described below? i. Scenario : 1 ii. Baseline for landfill gas : LFG2 iii. Baseline for electricity : P4 or P6 iv. Baseline for heat : H4 v. Description of situation: The atmospheric release of landfill gas or landfill gas is partially captured and subsequently flared. The electricity is obtained from an existing/new fossil based captive power plant or from the grid and heat from an existing/new fossil fuel based boiler, air heater or other heat generating equipment					
xii. If the project participants have rather used the "Combined tool to identify the baseline scenario and demonstrate additionality", was the same additional guidance as provided above used ?	ACM	0001	N/A		
d. Does the methodology require several alternative scenarios to be considered in	VVM	82	Yes,	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the identification of the most reasonable baseline scenario?			• LFG 1: The project activity (i.e. capture of landfill gas and its flaring and/or its use) undertaken without being registered as a CDM project activity. • LFG 2: Atmospheric release of the landfill gas, which represents the business as usual scenario. • P1. Power generated from landfill gas undertaken without being registered as a CDM project activity; • P2. Existing or Construction of a new on-site or off-site fossil fuel fired cogeneration plant; • P3. Existing or Construction of a new on-site or off-site renewable based cogeneration plant; • P4. Existing or Construction of a new on-site or off-site fossil fuel fired captive power plant; • P5. Existing or Construction of a new on-site or off-site renewable based captive power plant; • P6. Existing and/or new grid-connected power plants.		
e. If yes, are all scenarios that are considered by the project participants and	VVM	82	All scenarios that are considered by the project participants are those required by the methodology. there are no	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
are supplementary to those required by the methodology reasonable in the context of the proposed CDM project activity?			supplementary scenarios		
f. Has any reasonable alternative scenario been excluded?	VVM	82	No		
g. Is the baseline scenario identified reasonably supported by:	VVM	83			
i. Assumptions?	VVM	83	Refer section 3.p-q above	Ok	OK
ii. Calculations?	VVM	83	As all calculations to support baseline scenario are performed in IRR section - Refer to section 6 item c – Investment analysis.	Ok	OK
iii. Rationales?	VVM	83	Refer to section 6 item c – Investment analysis.	Ok	OK
h. Are the documents and sources referred to in the PDD correctly quoted and interpreted?	VVM	83	yes, provided in PDD footnotes and annex 3 of PDD		OK
i. Was the information provided in the PDD cross checked with other verifiable and credible sources, such as local expert opinion, if available? (identify the sources)	VVM	83	Yes, DOE validated LFG data by crosschecking with an expert Yuri Matveev who validated the waste data on separate tools to assess accuracy of baseline data	Ok	OK
j. Have all applicable CDM requirements been taken into account in the identification of the baseline scenario for the proposed CDM project activity?	VVM	84	yes, applicable tools and requirements by the methodology have been applied	Ok	OK
k. Have all relevant policies and circumstances been identified and correctly considered in the PDD, in	VVM	84	Yes, this is demonstrated through selection of appropriate barriers and assessment of applicable sectoral and regulatory environment in which the	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
accordance with the guidance by the CDM Executive Board?			project has been proposed, the guidelines of the EB are considered		
I. Does the PDD provide a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the proposed CDM project activity?	VVM	85	Baseline is <u>LFG 2</u> : Atmospheric release of the landfill gas represents the business as usual scenario and <u>P1</u> : Power generation without registration as a CDM project activity, <u>P6</u> : Power plants connected to the grid	Ok	OK
d. Algorithms and/or formulae used to determine emission reductions					
a. Do the steps taken and equations applied to calculate project emissions, baseline emissions, leakage and emission reductions comply with the requirements of the selected baseline and monitoring?	VVM	89	Yes	Ok	OK
b. Have the equations and parameters in the PDD been correctly applied with respect those in the select approved methodology?	VVM	90	Yes	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. Were baseline emissions calculated as follows : $BE_y = (MD_{project,y} - MD_{BL,y}) * GWP_{CH_4} + EL_{LFG,y} * CEF_{elec,BL,y} + ET_{LFG,y} * CEF_{ther,BL,y}$ Where : • BE_y = Baseline emissions in year y (tCO_{2e}) • $MD_{project,y}$ = The amount of methane that would have been destroyed/combusted during the year, in tonnes of methane (tCH₄) in project scenario • $MD_{BL,y}$ = The amount of methane that would have been destroyed/combusted during the year in the absence of the project due to regulatory and/or contractual requirement, in tonnes of methane (tCH₄) • GWP_{CH_4} = Global Warming Potential value for methane for the first commitment period is 21 tCO_{2e}/tCH₄ • $EL_{LFG,y}$ = Net quantity of electricity produced using LFG, which in the absence of the project activity would have been produced by power plants connected to the grid or by an on-site/off-site fossil fuel based captive power generation, during year y, in megawatt hours (MWh) • $CEF_{elec,BL,y}$ = CO₂ emissions intensity of	ACM	0001	Yes, $BE_y = (MD_{project,y} - MD_{BL,y}) * GWP_{CH_4} + EL_{LFG,y} * CEF_{elec,BL,y} + ET_{LFG,y} * CEF_{ther,BL,y}$ BE_y tCO_{2e} $MD_{project,y}$ tCH₄ $MD_{BL,y}$ tCH₄ GWP_{CH_4} tCO_{2e}/tCH₄ $EL_{LFG,y}$ MWh $CEF_{elec,BL,y}$ tCO_{2e}/MWh Baseline emissions in year y; The amount of methane that would have been destroyed/combusted during the year, in the project scenario; The amount of methane that would have been destroyed/combusted during the year in the absence of the project due to regulatory and/or contractual requirement; Global Warming Potential value for methane¹⁸; Net quantity of electricity produced using LFG, which in the absence of the project activity would have been produced by power plants connected to the grid or by an onsite/off-site fossil fuel based captive power generation, during year y; CO₂ emissions intensity of the baseline source of electricity displaced.	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the baseline source of electricity displaced, in tCO_{2e}/MWh This is estimated as per equation (9) below • $ET_{LFG,y}$ = The quantity of thermal energy produced utilizing the landfill gas, which in the absence of the project activity would have been produced from onsite/offsite fossil fuel fired boiler/air heater, during the year y in TJ • $CEF_{ther,BL,y}$ = CO₂ emissions intensity of the fuel used by boiler/air heater to generate thermal energy which is displaced by LFG based thermal energy generation, in tCO_{2e}/TJ. This is estimated as per equation (10) below					
ii. In the case when the $MD_{BL,y}$ is given/defined in the regulation and/or contract as a quantity, was that quantity used ?	ACM	0001	There is not regulation/ contract for destruction of methane from the landfill in the baseline, hence $MD_{BL,y} = 0$ This was confirmed by reviewing regulatory requirements for landfills and interviews at site visit with landfill operator	Ok	OK
iii. In situations where in the baseline LFG is captured and destroyed, for reasons other than regulation and/or contract, were historic data on actual amount captured used as $MD_{BL,y}$?	ACM	0001	Baseline LFG is not captured and destroyed, for reasons of regulation and/or contract	Ok	OK
iv. In the case when the $MD_{BL,y}$ is given/defined in the regulation and/or contract as a quantity, was that quantity used ?	ACM	0001	$MD_{BL,y}$ is not specified in contract, hence not quantified for use in later calculations, this was validated during site visit as discussed in earlier sections of the protocol	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
v. In cases where regulatory or contractual requirements do not specify $MD_{BL,y}$, or no historic data exists for LFG captured and destroyed, was an "Adjustment Factor" (AF) used and justified, taking into account the project context, using the guidance below . $MD_{BL,y} = MD_{project,y} * AF \quad (2)$	ACM	0001	N/A		
vi. In cases where a specific system for collection and destruction of methane is mandated by regulatory or contractual requirements or is undertaken for other reasons, was the ratio of the destruction efficiency of the baseline system to the destruction efficiency of the system used in the project activity used? The following procedure for AF should be followed :	ACM	0001	N/A		
vii. In the cases above, were the following 3-step procedure for AF followed?	ACM	0001	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
viii. Was step 1, estimation of the destruction efficiency of the system, followed?	ACM	0001	No, According to ACM0001 “In situations where the baseline specific system for collection and destruction of methane installed and operating prior to implementation of the project activity and measurements of the amount of methane that is destroyed are available then the following equation will be used: $\epsilon_{BL} = MD_{Hist} / MG_{Hist}$ however There was no installed /operating baseline collection system prior to implementation of the proposed project	Ok	OK
a. In situations where the baseline specific system for collection and destruction of methane installed and operating prior to implementation of the project activity and measurements of the amount of methane that is destroyed are available, was the following equation used ? $\epsilon_{BL} = MD_{Hist} / MG_{Hist} \quad (3)$ Where : ϵ_B = Destruction efficiency of the baseline system (fraction) MD_{His} = Amount of methane destroyed historically measured for the previous year before the start of project activity (tCH₄) MG_{Hist} = Amount of methane generated historically for the previous year before the start of project activity, estimated	ACM	0001	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
using the actual amount of waste disposed in the landfill as per the latest version of the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site” tCH_4)					
i. While estimating ex ante methane emissions that are generated in the landfill with latest version of the approved “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”, was the following guidance taken into account :	ACM	0001	Latest tool “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site” is not used	CAR 17	Ok
1. In the tool, x will refer to the year since the landfill started receiving wastes [x runs from the first year of landfill operation (x=1) to the year for which emissions are calculated (x=y)] ?	ACM	0001	Yes, Year during the crediting period : x runs from the year when the landfill started receiving wastes (x=1) to the year for which emissions are calculated (x=y); x = specific to all landfill sites By site visit interviews and reviews of EIA reports with Landfill operators it is provided in “Joburg LF BE CER v4 03 02 2011” x; Enerdale x = 1988 Robinson Deep x = 1936 Goudkoppies x = 1989 Marie Louise x = 1991 Linbro Park x = 1969	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl																					
2. Sampling to determine the different waste types is not necessary. The waste composition can be obtained from previous studies ?	ACM	0001	<table><tr><th>Waste type <i>j</i></th><th>DOC_j (% wet waste)</th><th>DOC_j (% dry waste)</th></tr><tr><td>Wood and wood products</td><td>43</td><td>50</td></tr><tr><td>Pulp, paper and cardboard (other than sludge)</td><td>40</td><td>44</td></tr><tr><td>Food, food waste, beverages and tobacco (other than sludge)</td><td>15</td><td>38</td></tr><tr><td>Textiles</td><td>24</td><td>30</td></tr><tr><td>Garden, yard and park waste</td><td>20</td><td>49</td></tr><tr><td>Glass, plastic, metal, other inert waste</td><td>0</td><td>0</td></tr></table> Above ratios are applied from Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site tool allows for application of data from tool hence no need to sample	Waste type <i>j</i>	DOC _j (% wet waste)	DOC _j (% dry waste)	Wood and wood products	43	50	Pulp, paper and cardboard (other than sludge)	40	44	Food, food waste, beverages and tobacco (other than sludge)	15	38	Textiles	24	30	Garden, yard and park waste	20	49	Glass, plastic, metal, other inert waste	0	0	Ok	OK
Waste type <i>j</i>	DOC _j (% wet waste)	DOC _j (% dry waste)																								
Wood and wood products	43	50																								
Pulp, paper and cardboard (other than sludge)	40	44																								
Food, food waste, beverages and tobacco (other than sludge)	15	38																								
Textiles	24	30																								
Garden, yard and park waste	20	49																								
Glass, plastic, metal, other inert waste	0	0																								

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
b. In cases, where the baseline system for collection and destruction of methane is not installed prior to project implementation and/or measurements of the amount of methane that is destroyed are not available then was the destruction efficiency of the system mandated by regulatory or contractual requirements (ϵ_{BL}) assumed to be equal to the theoretical efficiency of the specific system for collection and destruction of methane that is defined in the regulation or contract? In other cases :	ACM	0001	N/A to project	Ok	OK
i. Was a procedure for estimating the amount of landfill gas that would be captured in absence of the project activity provided in the CDM-PDD validated by the DOE ?	ACM	0001	N/A		
ii. Was this procedure used to estimate the MD_{Hist} in equation 3 above to estimate the baseline destruction efficiency ?	ACM	0001	N/A		
c. In cases, where a specific percentage of the “generated” amount of methane to be collected	ACM	0001	There is no specified contract or mandated by regulations a percentage of the “generated” amount of methane to be collected and destroyed	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
and destroyed is specified in the contract or mandated by regulations, the efficiency of the baseline system (ϵ_{BL}) is equal to the defined specific percentage:					
ix. Was step 2, estimation of the destruction efficiency of the system used in the project activity, followed and used one of the 2 options below?	ACM	0001	N/A		
a. Was option 1 used, where the destruction efficiency of the system used in the project activity is estimated once and remains fixed for the whole crediting period ?	ACM	0001	N/A		
b. If option 1 was used, was the destruction efficiency of the system estimated as follows ? $\epsilon_{PR} = MD_{project,1} / MG_{PR,1} \quad (4)$ Where : ϵ_{PR} = Destruction efficiency of the system used in the project activity that will remain fixed for the whole crediting period (fraction) $MD_{project,1}$ = Amount of methane destroyed by the project activity during the first year of	ACM	0001	N/A	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the project activity (tCH₄) • MG_{PR,1} = Amount of methane generated during the first year of the project activity estimated using the actual amount of waste disposed in the landfill as per the latest version of the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”, see guidance in Step 1 (tCH₄)					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
c. Was option 2 used, where the destruction efficiency of the system used in the project activity is estimated every year ?	ACM	0001	N/A		
d. If option 2 was used, was the destruction efficiency of the system estimated as follows ? $\varepsilon_{PR,y} = MD_{project,y} / MG_{PR,y} \quad (5)$ Where : • $\varepsilon_{PR,y}$ = Destruction efficiency of the system used in the project activity for year y (fraction) • $MD_{project,y}$ = Amount of methane destroyed by the project activity during the year y of the project activity (tCH₄) • $MG_{PR,y}$ = Amount of methane generated during year y of the project activity estimated using the actual amount of waste disposed in the landfill as per the latest version of the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site", see guidance in Step 1 (tCH₄)	ACM	0001	N/A	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
x. Was step 3, estimation of the adjustment factor (AF), followed and used one of the 2 options below?	ACM	0001	Adjustment factor does not form part of baseline/project calculations	Ok	OK
a. If option 1 was used in step 2 above, was the adjustment factor estimated as follows? $AF = \varepsilon_{BL} / \varepsilon_{PR} \quad (6)$	ACM	0001	N/A	Ok	OK
b. If option 2 was used in step 2 above, was the adjustment factor estimated as follows? $AF_y = \varepsilon_{BL} / \varepsilon_{PR,y} \quad (7)$ Where : • AF_y = Adjustment factor for year y, this factor will be used in equation 2 in place of AF)	ACM	0001	N/A	Ok	OK
xi. Did project proponents provide an ex ante estimate of emissions reductions, by projecting the future GHG emissions of the landfill as specified below?	ACM	0001			
a. Will $MD_{project,y}$ be determined ex post by metering the actual quantity of methane captured and destroyed once the project activity is operational ?	ACM	0001	$MD_{project,y} = MD_{flared,y} + MD_{electricity,y}$ Yes, The methane destroyed by the project activity is determined ex-post by monitoring the quantity of methane flared and/or used to generate electricity.	Ok	OK
b. Is the methane destroyed by the project activity ($MD_{project,y}$) during a	ACM	0001	Yes, the methane destroyed by the project activity ($MD_{project,y}$) during a year will be determined by monitoring	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
year be determined by monitoring the quantity of methane actually flared and gas used to generate electricity and/or produce thermal energy and/or supply to end users via natural gas distribution pipeline, if applicable, and the total quantity of methane captured?			the quantity of methane actually flared and the total quantity of methane captured gas by use of normalized flow meters Heat is not applicable for the project		
c. Is the sum of the quantities fed to the flare(s), to the power plant(s), to the boiler(s)/air heater(s)/heat generating equipment(s) and to the natural gas distribution network (estimated using equation 3) compared annually with the total quantity of methane generated and the lowest value of the two adopted as <i>MD_{project,y}</i> ?	ACM	0001	No, equation 3 is not applicable for the project hence actual readings for quantities fed to the flares are monitored and used	Ok	OK
d. Is the following procedure applied when the total quantity of methane generated is the highest?	ACM	0001			
i. Are working hours of the energy plant(s) and the boiler(s)/air heater(s)/heat generating equipment(s) monitored and no emission reduction claimed for methane destruction in the	ACM	0001	Yes in section B.7.1 Operation of the energy plant is monitored in Hours, Data will be recorded annually by the Project Developer to ensure methane destruction is claimed for methane used in electricity plant when it is Operational.	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
energy plant or the boiler/air heater/heat generating equipment during non-operational hours?					
e. Is $MD_{project,y}$ determined as follows ? $MD_{project,y} = MD_{flared,y} + MD_{electricity,y} + MD_{thermal,y} + MD_{PL,y}$ (8) Where : • $MD_{flared,y}$ = Quantity of methane destroyed by flaring (tCH_4) • $MD_{electricity,y}$ = Quantity of methane destroyed by generation of electricity (tCH_4) • $MD_{thermal,y}$ = Quantity of methane destroyed for the generation of thermal energy (tCH_4) • $MD_{PL,y}$ = Quantity of methane sent to the pipeline for feeding to the natural gas distribution network (tCH_4)	ACM	0001	$MD_{project,y} = MD_{flared,y} + MD_{electricity,y}$ $MD_{thermal,y}$ = Quantity of methane destroyed for the generation of thermal energy (tCH_4) = N/A $MD_{PL,y}$ = Quantity of methane sent to the pipeline for feeding to the natural gas distribution network (tCH_4) = N/A	Ok	OK
f. Is the right hand side of the equation (8) the sum over all the points of captured methane use in	ACM	0001	As destruction efficiency is not part of baseline consideration, this is N/A	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl																		
case the methane is flared in more than one flare, and/or used in more than one electricity generation source, and/or more than one thermal energy generator. The supply to each point of methane destruction, through flaring or use for energy generation, shall be measured separately?																							
g. Is the supply to each point of methane destruction, through flaring or use for energy generation, measured separately?	ACM	0001	PDD section B.6 If several flares or several electricity generators are used in the project, MD _{flared,y} and, respectively, MD _{electricity,y} will be the sum of the quantities destroyed in all the flares (respectively: in all the electricity generators).	Ok	OK																		
h. Is MD _{flared,y} determined as follows ? $MD_{flared,y} = \{LFG_{flare,y} * w_{CH4,y} * D_{CH4}\} - (PE_{flare,y} / GWP_{CH4})$ (9) Where : - LFG_{flare,y}= Quantity of landfill gas fed to the flare(s) during the year measured in cubic meters (m³) - w_{CH4,y}= Average methane fraction of the landfill gas as measured during the year and	ACM	0001	Yes, The quantity of methane destroyed by flaring is calculated using: $MD_{flared,y} = (LFG_{flare,y} * w_{CH4,y} * D_{CH4}) - (PE_{flare,y} / GWP_{CH4})$ Where: <table><tr><td>MD_{flared,y}:</td><td>tCH₄</td><td>Quantity of methane destroyed by flaring during year y;</td></tr><tr><td>LFG_{flare,y}:</td><td>Nm³LFG</td><td>Quantity of landfill gas fed to the flare(s) during the year y;</td></tr><tr><td>w_{CH4,y}:</td><td>Nm³CH₄/Nm³LFG</td><td>Average methane fraction of the landfill gas as measured¹⁹ during a year y;</td></tr><tr><td>D_{CH4}:</td><td>tCH₄/Nm³CH₄</td><td>Methane density²⁰;</td></tr><tr><td>PE_{flare,y}:</td><td>tCO₂e</td><td>Project emissions from flaring of the residual gas stream in year y determined following the procedure described in the “Tool to determine project emissions from flaring gases containing methane”;</td></tr><tr><td>GWP_{CH4}:</td><td>tCO₂e/tCH₄</td><td>Global Warming Potential of methane.</td></tr></table>	MD _{flared,y} :	tCH ₄	Quantity of methane destroyed by flaring during year y;	LFG _{flare,y} :	Nm ³ LFG	Quantity of landfill gas fed to the flare(s) during the year y;	w _{CH4,y} :	Nm ³ CH ₄ /Nm ³ LFG	Average methane fraction of the landfill gas as measured ¹⁹ during a year y;	D _{CH4} :	tCH ₄ /Nm ³ CH ₄	Methane density ²⁰ ;	PE _{flare,y} :	tCO ₂ e	Project emissions from flaring of the residual gas stream in year y determined following the procedure described in the “Tool to determine project emissions from flaring gases containing methane”;	GWP _{CH4} :	tCO ₂ e/tCH ₄	Global Warming Potential of methane.	Ok	OK
MD _{flared,y} :	tCH ₄	Quantity of methane destroyed by flaring during year y;																					
LFG _{flare,y} :	Nm ³ LFG	Quantity of landfill gas fed to the flare(s) during the year y;																					
w _{CH4,y} :	Nm ³ CH ₄ /Nm ³ LFG	Average methane fraction of the landfill gas as measured ¹⁹ during a year y;																					
D _{CH4} :	tCH ₄ /Nm ³ CH ₄	Methane density ²⁰ ;																					
PE _{flare,y} :	tCO ₂ e	Project emissions from flaring of the residual gas stream in year y determined following the procedure described in the “Tool to determine project emissions from flaring gases containing methane”;																					
GWP _{CH4} :	tCO ₂ e/tCH ₄	Global Warming Potential of methane.																					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
expressed as a fraction (in $\text{m}^3 \text{CH}_4/\text{m}^3 \text{LFG}$) • D_{CH_4}= Methane density expressed in tonnes of methane per cubic meter of methane ($\text{tCH}_4/\text{m}^3 \text{CH}_4$) (note : At standard temperature and pressure (0 degree Celsius and 1,013 bar) the density of methane is 0.0007168 $\text{tCH}_4/\text{m}^3 \text{CH}_4$.) • $PE_{\text{flare},y}$= Project emissions from flaring of the residual gas stream in year y (tCO_2e) determined following the procedure described in the "Tool to determine project emissions from flaring gases containing methane".					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. For $w_{CH_4,y}$ above, are methane fraction of the landfill gas and LFG flow measured on same basis (either wet or dry) ? In case the “Tool to determine project emissions from flaring gases containing methane” is used, follow the standard approaches to convert the flow on wet basis to dry basis.?	ACM	0001	Clarify approach used for methane fraction assumptions considered on basis (wet or dry)	CL18	Ok
ii. In case the “Tool to determine project emissions from flaring gases containing methane” is used, are the standard approaches to convert the flow on wet basis to dry basis followed. (for example, the procedures provided in the book “Fundamentals of Classical Thermodynamics”; Gordon J. Van Wylen, Richard E. Sonntag and Claus Borgnakke; 4 th Edition, 1994, John Wiley & Sons,	ACM	0001	LFG flow will be continuously monitored via normalised flow-meters (which automatically correct the quantity for fluctuations in temperature and pressure, thereby removing the need for separate temperature and pressure monitoring). The issue of monitoring LFG with normalized meters was raised as clarification to PP and clarified with referential information such as “CI-6202_3651_000 Biogas clarification of dry basis measurements”	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl												
Inc).? iii. For $PE_{flare,y}$ above, if methane is flared through more than one flare, is $PE_{flare,y}$ determined for each flare using the tool ?	ACM	0001	The project emissions from flaring gases are calculated as follow: $PE_{flare,y} = \sum_{i=1}^{8760} TM_{RG,h} \times (1 - \eta_{flare,h}) \times \frac{GWP_{CH_4}}{1000}$ However, $PE_{flare,y}$ shall be determined for each flare using the tool														
i. Is $MD_{electricity,y}$ determined as follows ? $MD_{electricity,y} = LFG_{electricity,y} * w_{CH_4,y} * D_{CH_4}$ (10) Where : $MD_{electricity,y}$= Quantity of methane destroyed by generation of electricity $LFG_{electricity,y}$= Quantity of landfill gas fed into electricity generator	ACM	0001	Yes, $MD_{electricity,y} = LFG_{electricity,y} * w_{CH_4,y} * D_{CH_4}$ Where: <table><tr><td>$MD_{electricity,y}$:</td><td>tCH₄</td><td>Quantity of methane destroyed by generation of electricity during year y;</td></tr><tr><td>$LFG_{electricity,y}$:</td><td>Nm³LFG</td><td>Quantity of landfill gas fed into the electricity generator during year y;</td></tr><tr><td>$w_{CH_4,y}$:</td><td>Nm³CH₄/Nm³LFG</td><td>Average methane fraction of the landfill gas as measured during year y;</td></tr><tr><td>D_{CH_4}:</td><td>tCH₄/Nm³LFG</td><td>Methane density.</td></tr></table>	$MD_{electricity,y}$:	tCH ₄	Quantity of methane destroyed by generation of electricity during year y;	$LFG_{electricity,y}$:	Nm ³ LFG	Quantity of landfill gas fed into the electricity generator during year y;	$w_{CH_4,y}$:	Nm ³ CH ₄ /Nm ³ LFG	Average methane fraction of the landfill gas as measured during year y;	D_{CH_4} :	tCH ₄ /Nm ³ LFG	Methane density.	Ok	OK
$MD_{electricity,y}$:	tCH ₄	Quantity of methane destroyed by generation of electricity during year y;															
$LFG_{electricity,y}$:	Nm ³ LFG	Quantity of landfill gas fed into the electricity generator during year y;															
$w_{CH_4,y}$:	Nm ³ CH ₄ /Nm ³ LFG	Average methane fraction of the landfill gas as measured during year y;															
D_{CH_4} :	tCH ₄ /Nm ³ LFG	Methane density.															
j. Is $MD_{thermal,y}$ determined as follows $MD_{thermal,y} = LFG_{thermal,y} * w_{CH_4,y} * D_{CH_4}$ (11) Where :	ACM	0001	N/A		OK												

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
• $MD_{thermal,y}$ = Quantity of methane destroyed for the generation of thermal energy • $LFG_{thermal,y}$ = Quantity of landfill gas fed into the boiler/air heater/heat generatin equipment					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
k. Is $MD_{PL,y}$ determined as follows ? $MD_{PL,y} = LFG_{PL,y} * w_{CH_4,y} * D_{CH_4} \quad (12)$ Where : $MD_{thermal,y}$ = Quantity of methane destroyed for the generation of thermal energy $LFG_{PL,y}$ = Quantity of landfill gas sent to pipeline for feeding to the natural gas distribution network	ACM	0001	N/A		
l. Was the ex ante estimation of the the amount of methane that would have been destroyed/combusted during the year, in tonnes of methane ($MD_{project,y}$) done with the latest version of the approved “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”?	ACM	0001	No, Pending on CAR page 73 above	Ok	OK
m. In doing so, was the following additional equation considered? $MD_{project,y} = BE_{CH_4,SWDS,y}/GWP_{CH_4} \quad (13)$ Where : $BE_{CH_4,SWDS,y}$ = Methane	ACM	0001	Yes, $MD_{project,y} = BE_{CH_4,SWDS,y}/GWP_{CH_4} * \epsilon_{degassing\ system}^{21}$ $\epsilon_{degassing\ system}$ is added as per ACM0001 “The efficiency of the degassing system which will be installed in the project activity should be taken into		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
generation from the landfill in the absence of the project activity at year y (tCO ₂ e), calculated as per the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”. The tool estimates methane generation adjusted for, using adjustment factor (f) any landfill gas in the baseline that would have been captured and destroyed to comply with relevant regulations or contractual requirements, or to address safety and odor concerns. As this is already accounted for in equation 2, “f” in the tool shall be assigned a value 0			account while estimating the ex ante estimation” f = 0		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
n. The tool above estimates methane generation adjusted for, using adjustment factor (f) any landfill gas in the baseline that would have been captured and destroyed to comply with relevant regulations or contractual requirements, or to address safety and odor concerns As this is already accounted for in equation 2, was “f” in the tool assigned a value 0 ?	ACM	0001	N/A nevertheless value assigned is 0	Ok	OK
o. In the tool above, does x refer to the year since the landfill started receiving wastes [x runs from the first year of landfill operation (x=1) to the year for which emissions are calculated (x=y)] ?	ACM	0001	Yes, x = 1969 Linbro Park x = 1991 Marie Louise x = 1989 Goudkoppies x = 1988 Enerdale x = 1936 Robinson Deep	Ok	OK
p. In the tool above, sampling to determine the different waste types is not necessary, the waste composition can be obtained from previous studies	ACM	0001	Guidance based on Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site	Ok	OK
q. Was the efficiency of the degassing system which will be installed in the project activity taken into account while estimating the ex ante estimation ?	ACM	0001	50% collection efficiency is applied, this is default value from the tool	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
xii. Was $CEF_{elec,BL,y}$ determined as specified below?	ACM	0001			
a. In case the baseline is electricity generated by an on-site/off-site fossil fuel fired captive power plant in the baseline, have project proponents used a default value of 0.8 tCO ₂ /MWh ?	ACM	0001	N/A	Ok	OK
b. or estimated the emission factor as follows ? $CEF_{dec,BL,y} = \frac{EF_{fuel,BL}}{\varepsilon_{gen,BL} \cdot NCV_{fuel,BL}} \cdot 3.6 \quad (14)$ Where : • $EF_{fuel,BL}$ = Emission factor of baseline fossil fuel used, as identified in the baseline scenario identification procedure, expressed in tCO₂/mass of volume unit • $NCV_{fuel,BL}$ = Net calorific value of fuel, as identified through the baseline identification procedure, in GJ per unit of volume or mass	ACM	0001	N/A	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
• $\varepsilon_{\text{gen,BL}}$ = Efficiency of baseline power generation plant • 3.6 = Equivalent of GJ energy in MWh of electricity					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
c. To estimate electricity generation efficiency, have project participants used the possibility to choose the highest value among the following values as a conservative approach?	ACM	0001	N/A	Ok	
i. Measured efficiency prior to project implementation.?	ACM	0001	N/A		
ii. Measured efficiency during monitoring.?	ACM	0001			
iii. Data from manufacturer for efficiency at full load ?	ACM	0001	N/A		
iv. Default efficiency of 60% ?	ACM	0001	N/A		
d. In case the baseline is electricity generated by plants connected to the grid, is the emission factor calculated according to “Tool to calculate the emission factor for an electricity system” ?	ACM	0001	Yes, emission factor calculated according to “Tool to calculate the emission factor for an electricity system” where the combined margin is therefore calculated as; The combined margin emission factor is calculated as follows: $EF_{grid,CM,y} = (EF_{grid,OM,y} * W_{OM}) + (EF_{grid,BM,y} * W_{BM}) = 0.977$	Ok	OK
xiii. Was $CEF_{therm,BL,y}$ determined as specified below? $CEF_{therm,BL,y} = \frac{EF_{fuel,BL}}{\varepsilon_{boiler/airheater} \cdot NCV_{fuel,BL}} \quad (15)$ Where :	ACM	0001	N/A	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
• $\varepsilon_{\text{gen,BL}}$ = The energy efficiency of the boiler/air heater used in the absence of the project activity to generate the thermal energy • $\text{NCV}_{\text{fuel,BL}}$ = Net calorific value of fuel, as identified through the baseline identification procedure, used in the boiler/air heater to generate the thermal energy in the absence of the project activity in TJ per unit of volume or mass • $\text{EF}_{\text{fuel,BL}}$ = Emission factor of the fuel, as identified through the baseline identification procedure, used in the boiler/air heater to generate the thermal energy in the absence of the project activity in tCO₂ / unit of volume or mass of the fuel					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
a. To estimate boiler efficiency, have project participants chosen between the following two options:?	ACM	0001	N/A		
i. If option A , has the highest value among the following three values been used as a conservative approach ?	ACM	0001	N/A		
1. Measured efficiency prior to project implementation ?	ACM	0001	N/A		
2. Measured efficiency during monitoring ?	ACM	0001	N/A		
3. Manufacturer's information on the boiler efficiency ?	ACM	0001	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. If option B , is a boiler efficiency of 100% assumed based on the net calorific values as a conservative approach ?	ACM	0001	N/A		
b. To estimate air heater efficiency, have project participants assumed an air heater efficiency of 100% based on the net calorific value of the fuel used as a conservative approach ?	ACM	0001	N/A		
c. In determining the CO ₂ emission factors (EF _{fuel}) of fuels, have reliable local or national data been used, if available?	ACM	0001	N/A		
d. Where such data is not available, were IPCC default emission factors chosen in a conservative manner?	ACM	0001	N/A		
xiv. Was PE _y determined as follows? $PE_y = PE_{EC,y} + PE_{FC,j,y} \quad (16)$ Where : • PE _{EC,y} = Emissions from consumption of electricity in the project case.	ACM	0001	Project emissions are calculated as follows: $PE_y = PE_{EC,y} + PE_{FC,j,y}$ equation 16 of PDD	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
• $PE_{FCj,y}$ = Emissions from consumption of heat in the project case. If in the baseline part of the LFG was captured then the heat quantity used in calculation is fossil fuel used in project activity net of that consumed in the baseline.					

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
a. Were the project emissions from electricity consumption ($PE_{EC,y}$) above calculated following the latest version of “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”?	ACM	0001	Yes, the latest Tool to calculate baseline, project and/or leakage emissions from electricity consumption” Version 01, adopted at EB 39 is used	Ok	OK
b. If in the baseline a part of LFG was captured then is the electricity quantity used in calculation electricity used in project activity net of that consumed in the baseline ?	ACM	0001	N/A in the baseline no part of LFG was captured	Ok	OK
c. Were the project emissions from fossil fuel combustion ($PE_{FC,j,y}$) calculated following the latest version of “Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion” ?	ACM	0001	Yes, project emissions from fossil fuel combustion ($PE_{FC,j,y}$) were calculated using the latest Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion”, Version 02, adopted at EB 41 was	Ok	OK
d. For this purpose, do the processes j in the tool correspond to all fossil fuel combustion in the landfill, as well as any other on-site fuel combustion for the purposes of the project activity?	ACM	0001	Fossil fuel consumption in the project are diesel combusted to meet power requirements of project. Consumption of diesel (during power failure) will be metered and supplied from tanks with calibrated ruler gauges). Consideration of diesel alone as j in this project is reasonable considering the nature of LFG combustion units	Ok	OK
e. If in the baseline part of the LFG was captured, was the heat	ACM	0001	N/A	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
quantity used in calculation the fossil fuel used in project activity net of that consumed in the baseline?					
xv. Were emission reductions calculated as follows? $ER_y = BE_y - PE_y \quad (17)$ Where : • ER_y = Emission reductions in year y (tCO_{2e}/yr) • BE_y = Baseline emissions in year y (tCO_{2e}/yr) • PE_y = Project emissions in year y (tCO₂/yr)	ACM	0001	Yes, where emission reductions calculated as follows $ER_y = BE_y - PE_y$ Where; $BE_y = (MD_{project,y} - MD_{BL,y}) * GWP_{CH4} + (EL_{LFG,y} * CEF_{elec,BL,y})$ And $PE_y = PE_{EC,y} + PE_{FC,j,y}$ plus additional emissions due to flaring i.e. $PE_{flare,y} = \sum_{i=1}^{8760} TM_{RG,h} \times (1 - \eta_{flare,h}) \times \frac{GWP_{CH4}}{1000}$	Ok	OK
xvi. Are the following data and parameters not monitored (refer to the calculations above for more details)?	ACM	0001			
a. Regulatory requirements relating to landfill gas	ACM	0001	Not monitored	Ok	OK
b. GWP_{CH4}	ACM	0001	Not monitored default value of 21 IPCC is applied	Ok	OK
c. D_{CH4}	ACM	0001	ACM0001version 11 provides default value of 0.0007168	Ok	OK
d. $BE_{CH4,SWDS,y}$	ACM	0001	Methane generation from the landfill in the absence of the project activity at year y = <i>ex-ante</i> estimate: 484,966 tCO _{2e} (annual average over 1 st crediting period)		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
e. MD _{Hist}	ACM	0001	N/A and hence not monitored	Ok	OK
f. MG _{Hist}	ACM	0001	N/A and hence not monitored	Ok	OK
c. Does the methodology provide for selection between different options for equations or parameters?	VVM	90	Yes in determination of; Destruction efficiency Estimation of the adjustment factor (AF) Determination of CEF _{elec,BL,y}	Ok	OK
d. If yes, has adequate justification been provided (based on the choice of the baseline scenario, context of the proposed CDM project activity and other evidence provided)?	VVM	90	Yes e.g refer TDL 8% RSA Grid For <i>ex-ante</i> estimation purposes, Eskom Annual Report 2008, Directors' Report, p. 105 has been employed. W_x Data is taken from historical records of landfill operation that are provided to DOE and aggregated annually. F = 0 Fraction of methane captured at the SWDS and flared, combusted or used in another manner which is validated and discussed elsewhere in the protocol k_j = The values applied are for Boreal & temperate (MAT < 20°C) and dry (MAP < 1,000mm) conditions. Climate data for Johannesburg from the South African Weather Service is provided and available to and is deemed reasonable	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			MCF = 1.0 justified and observed at site visit as well as attested to by Landfill expert in validation team <i>FC_{i,m,y}</i> = from Eskom (South African electricity supply company) NERSA (National Electricity Regulator South Africa), latest Electricity Supply Statistics		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
e. If yes, have correct equations and parameters been used, in accordance with the methodology selected?	VVM	90	Refer to (5.e.b) above	-	-
f. Will data and parameters be monitored throughout the crediting period of the proposed CDM project activity?	VVM	91	Yes, $LFG_{total,y}$ = Total amount of LFG captured at Normal Temperature and Pressure $LFG_{flare,y}$ = Amount of LFG flared at Normal Temperature and Pressure $LFG_{electricity,y}$ = Amount of LFG combusted in power plants at Normal Temperature and Pressure $PE_{flare,y}$ = Project emissions from flaring of the residual gas stream in year y w_{CH4} = Methane fraction in the landfill gas EL_{LFG} = Net amount of electricity generated using LFG Operation of the energy plant = Operation of the energy plant in a year y $PE_{EC,y}$ = Project emissions from electricity consumption by the project activity during the year y		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			$PE_{FC,j,y}$ = Project emissions from fossil fuel combustion in fossil fuel based generators during the year y T_{flare} = Temperature in the exhaust gas of the flare Other flare operational parameters = Includes all data and parameters that are required to monitor whether the flare operates within the range of operating conditions according to manufacturer's specifications. $EC_{PJ,j,y}$ = Onsite consumption of electricity attributable to the project activity during the year y $FC_{i,j,y}$ = Amount of diesel combusted to meet power requirements of project		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
g. If no, and these data and parameters will remain fixed throughout the crediting period, are all data sources and assumptions:	VVM	91	Yes as discussed in page 24 of protocol	Ok	OK
i. Appropriate and correct?	VVM	91	Yes all data sources and assumptions are justified and reasonable	Ok	OK
ii. Applicable to the proposed CDM project activity?	VVM	91	Yes all data sources and assumptions are applicable	Ok	OK
iii. Resulting in a conservative estimate of the emission reductions?	VVM	91	A conservative approach is demonstrated as discussed on page 24	Ok	OK
h. Will data and parameters be monitored on implementation and hence become available only after validation of the project activity?	VVM	91	Yes		OK
i. If yes, are the estimates provided in the PDD for these data and parameters reasonable?	VVM	91	Yes e.g $EC_{PJ,j,y} = 4820\text{MWh}$ based on power requirement of LFG units $FC_{i,j,y} = 0$, hence $PE_{FC,j,y} = 0$ only to consume diesel in genset in event of power failure $PE_{EC,y} = 35,601\text{tCO}_2$ Operation of the energy plant = 7,800 hours reasonable estimate based on equipment availability in a year $EL_{LFG} = 67,739$ reasonable estimate based on equipment availability in a year $PE_{flare,y} = 5124\text{ tCO}_2$ reasonably estimated from equipment capacity and LFG extraction	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
6. Additionality of a project activity					
a. Does the PDD describe how a proposed CDM projet activity is additional?	VVM	94	Yes, additionality is demonstrated through investment analysis substep 2b	Ok	OK
b. Were the following steps of the tool to assess additionality used:	EB 39	Ann 10			
i. Identification of alternatives to the project activity?	EB 39	Ann 10	Yes, Step 1. Identification of alternatives scenarios Sub-step 1a. Define alternatives to the project activity: Sub-step 1b. Enforcement of applicable laws and regulations: Is used	Ok	OK
ii. Investment analysis to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible?	EB 39	Ann 10	Yes, Step 2. Investment Analysis Sub-step 2a: Determine appropriate analysis method Sub-step 2b: Option III - Apply benchmark analysis Sub-step 2c: Calculation and comparison of financial indicators Sub-step 2d: Sensitivity analysis	Ok	OK
iii. Barriers analysis?	EB 39	Ann 10	Not used	Ok	OK
iv. Common practice analysis?	EB 39	Ann 10	Yes, Step 4. Common Practice Analysis for South Africa Sub-step 4a: Analyse other activities similar to the proposed project activity Sub-step 4b: Discuss any similar options that are occurring	Ok	OK
c. In step 1 (i) have all the sub-steps as below been followed?	EB 39	Ann 10			

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
i. Sub-step 1a: Define alternatives to the project activity	EB 39	Ann 10	Yes,		OK
ii. Sub-step 1b: Consistency with mandatory laws and regulations	EB 39	Ann 10	Yes		OK
d. Have the following alternatives been included while defining alternatives as per sub-step 1a?	EB 39	Ann 10			
i. (a) The proposed project activity undertaken without being registered as a CDM project activity;	EB 39	Ann 10	Yes		OK
ii. (b) Other realistic and credible alternative scenario(s) to the proposed CDM project activity scenario that deliver outputs services or services with comparable quality, properties and application areas, taking into account, where relevant, examples of scenarios identified in the underlying methodology;	EB 39	Ann 10	Yes		OK
iii. (c) If applicable, continuation of the current situation (no project activity or other alternatives undertaken).	EB 39	Ann 10	Yes		OK
e. Has the project participant included the technologies or practices that provide outputs or services with comparable quality, properties and application areas as the proposed CDM project activity and that have been implemented previously or are currently being introduced in the	EB 39	Ann 10	Yes		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
relevant country/region?					
f. Has the outcome of Step 1a: Identified realistic and credible alternative scenario(s) to the project activity done correctly? Please briefly mention the outcome.	EB 39	Ann 10	The only alternatives remaining for power generation are therefore P1 and P6. The only plausible remaining options are: • LFG 2: Atmospheric release of the landfill gas, which represents the business as usual scenario. • P1: Power generated from landfill gas undertaken without being registered as CDM project activity P1 also corresponds to LFG 1. which represents the project activity. • P6: Power plants connected to the grid.	Ok	OK
g. Is the alternative(s) in compliance with all mandatory applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution.?	EB 39	Ann 10	Yes		Ok
h. If an alternative does not comply with all mandatory applicable legislation and regulations, has it been shown that, based on an examination of current practice in the country or region in which the law or regulation applies, those applicable legal or regulatory requirements are systematically not enforced and that noncompliance with those requirements is widespread in the country?	EB 39	Ann 10	N/A in the project		
i. Has the outcome of Step 1b: Identified realistic and credible alternative	EB 39	Ann 10	Scenarios <u>LFG 2:</u> Atmospheric release of the landfill gas represents the business as usual scenario The	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
scenario(s) to the project activity that are in compliance with mandatory legislation and regulations taking into account the enforcement in the region or country and EB decisions on national and/or sectoral policies and regulations done correctly? Please state the outcome.			prevailing practice in South Africa is either vent the LFG to ensure that the concentration of methane in any particular area of the landfill stays below hazardous levels, or to not install any kind of capturing system. <u>P1</u> : Power generation without registration as a CDM project activity, complies with all the applicable laws and regulations. <u>P6</u> : Power plants connected to the grid, complies with all the applicable laws and regulations, through ERC requirements All above would comply with national and local regulations as there are no laws/regulations which specify that is mandatory to destroy landfill gas as common practice at all landfills.		
j. Has PP selected Step 2 (Investment analysis) or Step 3 (Barrier analysis) or both Steps 2 and 3?	EB 39	Ann 10	See below.		OK
k. In step 2, have all the sub-steps as below been followed?	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
i. Sub-step 2a: Determine appropriate analysis method;	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
ii. Sub-step 2b: Option I. Apply simple cost analysis;	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
iii. Sub-step 2b: Option II. Apply investment comparison analysis;	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
iv. Sub-step 2b: Option III. Apply benchmark analysis;	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
v. Sub-step 2c: Calculation and	EB 39	Ann	Refer to section 6 item c – Investment analysis.		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
comparison of financial indicators (only applicable to Options II and III);		10			
vi. Sub-step 2d: Sensitivity analysis (only applicable to Options II and III).	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
I. In sub-step 2a has the determination of appropriate method of analysis done as per the guidance as below?	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
i. Simple cost analysis if the CDM project activity and the alternatives identified in Step 1 generate no financial or economic benefits other than CDM related income (Option I).	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
ii. Otherwise, use the investment comparison analysis (Option II) or the benchmark analysis (Option III). Specify option used with justification.	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
m. Has the below guideline followed for sub-step 2b Option I. Apply simple cost analysis? Document the costs associated with the CDM project activity and the alternatives identified in Step1 and demonstrate that there is at least one alternative which is less costly than the project activity.	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
n. Has the below guideline followed for sub-step 2b Option II. Apply investment comparison analysis? Identify the financial indicator, such as IRR, NPV, cost benefit ratio, or unit cost of service	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
most suitable for the project type and decision-making context. Please specify					
o. Has the below guideline followed for Sub-step 2b: Option III. Apply benchmark analysis?	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
i. Identify the financial/economic indicator, such as IRR, most suitable for the project type and decision context.	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
ii. When applying Option II or Option III, the financial/economic analysis shall be based on parameters that are standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer. Only in the particular case where the project activity can be implemented by the project participant, the specific financial/economic situation of the company undertaking the project activity can be considered.	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
iii. Discount rates and benchmarks shall be derived from: (a) Government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, as substantiated by an independent (financial) expert or documented by official publicly available financial data; (b) Estimates of the cost of financing	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
and required return on capital (e.g. commercial lending rates and guarantees required for the country and the type of project activity concerned), based on bankers views and private equity investors/funds' required return on comparable projects; (c) A company internal benchmark (weighted average capital cost of the company), only in the particular case referred to above in 2. The project developers shall demonstrate that this benchmark has been consistently used in the past, i.e. that project activities under similar conditions developed by the same company used the same benchmark; (d) Government/official approved benchmark where such benchmarks are used for investment decisions; (e) Any other indicators, if the project participants can demonstrate that the above Options are not applicable and their indicator is appropriately justified. Please specify benchmark and justify.					
p. Has the below guideline followed for Sub-step 2c: Calculation and comparison of financial indicators (only applicable to Options II and III)?	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
i. Calculate the suitable financial indicator for the proposed CDM project activity	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
and, in the case of Option II above, for the other alternatives. Include all relevant costs (including, for example, the investment cost, the operations and maintenance costs), and revenues (excluding CER revenues, but possibly including inter alia subsidies/fiscal incentives, ODA, etc, where applicable), and, as appropriate, non-market cost and benefits in the case of public investors if this is standard practice for the selection of public investments in the host country.					
ii. Present the investment analysis in a transparent manner and provide all the relevant assumptions, preferably in the CDM-PDD, or in separate annexes to the CDM-PDD.	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
iii. Justify and/or cite assumptions.	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
iv. In calculating the financial/economic indicator, the project's risks can be included through the cash flow pattern, subject to project-specific expectations and assumptions.	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
v. Assumptions and input data for the investment analysis shall not differ across the project activity and its alternatives, unless differences can be well substantiated.	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
vi. Present in the CDM-PDD a clear comparison of the financial indicator for the proposed CDM activity. Please specify details for above.	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
q. Has the below guideline followed for Sub-step 2d: Sensitivity analysis (only applicable to Options II and III)? Include a sensitivity analysis that shows whether the conclusion regarding the financial/economic attractiveness is robust to reasonable variations in the critical assumptions.	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
r. Has the outcome of Step 2 clearly mentioned with justification?	EB 39	Ann 10	Refer to section 6 item c – Investment analysis.		OK
s. In step 3: Barrier analysis have all the sub-steps as below been followed?	EB 39	Ann 10	Barrier analysis is not employed		Ok
i. Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CDM project activity;	EB 39	Ann 10	Barrier analysis is not employed		Ok
ii. Sub-step 3 b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity).	EB 39	Ann 10	Barrier analysis is not employed		Ok
t. Has the below guideline followed for Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CDM project?	EB 39	Ann 10	Barrier analysis is not employed		Ok
i. (a) Investment barriers: For alternatives	EB 39	Ann	Barrier analysis is not employed		Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
undertaken and operated by private entities: Similar activities have only been implemented with grants or other non-commercial finance terms. No private capital is available from domestic or international capital markets due to real or perceived risks associated with investment in the country where the proposed CDM project activity is to be implemented, as demonstrated by the credit rating of the country or other country investments reports of reputed origin.		10			
ii. (b) Technological barriers: Skilled and/or properly trained labour to operate and maintain the technology is not available in the relevant country/region, which leads to an unacceptably high risk of equipment disrepair and malfunctioning or other underperformance; Lack of infrastructure for implementation and logistics for maintenance of the technology, Risk of technological failure: the process/technology failure risk in the local circumstances is significantly greater than for other technologies that provide services or outputs comparable to those of the proposed CDM project activity, as	EB 39	Ann 10	Barrier analysis is not employed		Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
demonstrated by relevant scientific literature or technology manufacturer information, The particular technology used in the proposed project activity is not available in the relevant region.					
iii. (c) Barriers due to prevailing practice: The project activity is the “first of its kind”.	EB 39	Ann 10	Barrier analysis is not employed		Ok
iv. (d) Other barriers, preferably specified in the underlying methodology as examples.	EB 39	Ann 10	Barrier analysis is not employed		Ok
u. Has the outcome from Step 3a clearly mentioned in PDD?	EB 39	Ann 10	Barrier analysis is not employed		Ok
v. Has the below guideline followed for Sub-step 3 b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity)?	EB 39	Ann 10	Barrier analysis is not employed		Ok
i. If the identified barriers also affect other alternatives, explain how they are affected less strongly than they affect the proposed CDM project activity. In other words, demonstrate that the identified barriers do not prevent the implementation of at least one of the alternatives. Any alternative that would be prevented by the barriers identified in Sub-step 3a is not a viable alternative, and shall be eliminated from	EB 39	Ann 10	Barrier analysis is not employed		Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
consideration.					
ii. Provide transparent and documented evidence, and offer conservative interpretations of this documented evidence, as to how it demonstrates the existence and significance of the identified barriers and whether alternatives are prevented by these barriers.	EB 39	Ann 10	Barrier analysis is not employed		Ok
iii. The type of evidence to be provided should include at least one of the following: (a) Relevant legislation, regulatory information or industry norms; (b) Relevant (sectoral) studies or surveys (e.g. market surveys, technology studies, etc) undertaken by universities, research institutions, industry associations, companies, bilateral/multilateral institutions, etc; (c) Relevant statistical data from national or international statistics; (d) Documentation of relevant market data (e.g. market prices, tariffs, rules); (e) Written documentation of independent expert judgments from industry, educational institutions (e.g. universities, technical schools, training centres), industry associations and others. Please specify.	EB 39	Ann 10	Barrier analysis is not employed		Ok
w. Has the outcome from Step 3 clearly	EB 39	Ann	Barrier analysis is not employed		Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
mentioned in PDD?		10			
x. In step 4: Common practise analysis have all the sub-steps as below followed?	EB 39	Ann 10			
i. Sub-step 4a: Analyze other activities similar to the proposed project activity;	EB 39	Ann 10	As the proposed project type is not demonstrated to be first-of-its kind, a credibility check to complement the investment analysis (Step 2) is performed. As survey (Ref Cat 2 – 67) carried out in terms of this brief during the period from June to October 2004 established that 453 sites were operational or in the process of being issued permits. Site selection process led to the evaluation of 57 sites throughout South Africa to determine their potential to product LFG electrical energy. These were sites neighbouring Metropolitan areas with potential for LFG recovery. By tabulating the identified 57 sites on basis of size, tonnage input of solid wastes and the potential landfill gas that may be extracted from each site, a list of twenty landfills in descending order of potential was established presented in PDD		OK
ii. Sub-step 4b: Discuss any similar Options that are occurring.	EB 39	Ann 10	In discussing other options that are occurring; with the exception of a few landfills developing a CDM project, the other landfills do not have LFG collection and flaring systems. The reason for the lack of widespread LFG collection and combustion systems is that there currently is no law mandating the capture and destruction (or use) of LFG, and there is no economic		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			incentive for capturing and utilising the LFG. The passive venting method remains the prevailing practice in landfills throughout the Host Country.		
y. Has the below guideline followed for Sub-step 4a: Analyze other activities similar to the proposed project activity? Provide an analysis of any other activities that are operational and that are similar to the proposed project activity. Other CDM project activities are not to be included in this analysis. Provide documented evidence and, where relevant, quantitative information. On the basis of that analysis, describe whether and to which extent similar activities have already diffused in the relevant region.	EB 39	Ann 10	In the analysis of other activities similar to the proposed project activity Out of 50 potential landfill sites identified by the consultant 7 landfills analyzed, out of the seven landfills four were CDM projects (registered or in progress) this therefore means that 3 out of 50 landfills are eligible for assessment, please discuss how plausible the conclusion of the study is in view of this sample chosen. Refer SRK Consulting study, "Landfill Gas Common Management Practice in South Africa" and the Department of Minerals and Energy, study "Landfill Gas Resources for Power Generation in South Africa" <u>Refer CL21</u> A transparent analysis for landfill common practice shall be provided on PDD	CL 8 CL21	OK Ok
z. Has the below guideline followed for Sub-step 4b: Discuss any similar Options that are occurring? If similar activities are identified, then it is necessary to demonstrate why the existence of these activities does not contradict the claim that the proposed project activity is	EB 39	Ann 10	In context of explaining essential distinctions the passive venting method remains the prevailing practice in landfills throughout the Host Country	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
financially/economically unattractive or subject to barriers. This can be done by comparing the proposed project activity to the other similar activities, and pointing out and explaining essential distinctions between them that explain why the similar activities enjoyed certain benefits that rendered it financially/economically attractive (e.g., subsidies or other financial flows) and which the proposed project activity cannot use or did not face the barriers to which the proposed project activity is subject. In case similar projects are not accessible, the PDD should include justification about non-accessibility of data/information.					
aa. Has the outcome from Step 4 clearly mentioned in PDD?	EB 39	Ann 10	Yes	Ok	OK
bb. Has it been proved that the project is additional?	EB 39	Ann 10	Yes	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
<i>a. Prior consideration of the clean development mechanism</i>					
a. Is the project activity start date prior to the date of publication of the PDD for stakeholder comments?	VVM	98	Yes, Chronology is provided in PDD And consideration for prior consideration was necessary as starting date (29 May 2009) is earlier than the date of publication of the CDM-PDD for global stakeholder consultation • Newspaper excerpt of Tender Notice published by City of Johannesburg Metropolitan Municipality to develop five sites under the CDM Dated 23/04/2007. • The tender notice mentions that the Johannesburg municipality, owner of the sites, is interested in developing the project under CDM. • Original ERPA signed between the project developer and EcoSecurities Dated 10/07/2008 The signing of ERPA before the start date of the project activity demonstrates prior consideration of CDM by the Project Developer. • Final Lease & Gas Rights Agreement Signed by the Project Developer and the Municipality of Johannesburg to develop the proposed project under CDM 27/05/2009 which was confirmed as that Project Developer will enter into ERPA for the sale and purchase of CERs related to the project with EcoSecurities. • Purchase order for Generators dated 29/05/2009 is representative of Start date CDM Project	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			• Submittal EIA and EMP scoping reports in September 2009 EIA included a stakeholder consultation • Notification of CDM consideration sent to UNFCCC and DNA dated 20/11/2009 Within 6 months after signing Agreement with the Municipality.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
b. If yes, were the CDM benefits considered necessary in the decision to undertake the project as a proposed CDM project activity?	VVM	98	Evidence that DNA of South Africa was informed of the prior consideration for CDM is provided	CL 9	Ok
c. Is the start date of the project activity, reported in the PDD, in accordance with the "Glossary of CDM terms", which states that "The starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins."?	VVM	99	Hence purchase order for generators issued 29th May 2009 Is the start date of the project activity, reported in the PDD,	Ok	OK
d. Does the project activity require construction, retrofit or other modifications?	VVM	99	The project activity require construction as it is Greenfield project	Ok	OK
e. If yes, is it ensured that the date of commissioning cannot be considered as the project activity start date?	VVM	99	Yes, date of commissioning is Q3 of 2011	Ok	OK
f. Is it a new project activity (a project activity with a start date on or after 02 August 2008) or an existing project activity (a project activity with a start date before 02 August 2008)?	VVM	100	It is a new project with a start date on or after 02 August 2008	Ok	OK
g. For a new project, for which PDD has not been published for global stakeholder consultation or a new methodology proposed to the CDM Executive Board before the project activity start date, had PP's informed the host Party DNA and the	VVM	101	Please Provide reference to information to the UNFCCC secretariat in writing of commencement of the project activity and of their confirmation from host Party DNA and UNFCCC secretariat	CL 10	Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status? (Provide reference to such confirmation from host Party DNA and UNFCCC secretariat).					
h. For an existing project activity, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, are the following evidences provided:	VVM	102			
ii. evidence that must indicate that awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project, including, inter alia:	VVM	102	Yes, in PDD and validated at site visit consideration for prior consideration was necessary as starting date (29 May 2009) is earlier than the date of publication of the CDM-PDD for global stakeholder consultation. Discussed page 115 of protocol		OK
a. minutes and/or notes related to the consideration of the decision by the Board of Directors, or equivalent, of the project participant, to undertake the project as a proposed CDM project activity?	VVM	102	Evidence of Lease and gas rights agreement to undertake the project as a proposed CDM project activity is not provided	CL 11	Ok
iii. reliable evidence from project participants that must indicate that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation,	VVM	102			

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
including, inter alia:					
a. contract with consultants for CDM/PDD/methodology services?	VVM	102	Original ERPA signed between the project developer and EcoSecurities Dated 10/07/2008 The signing of ERPA before the start date of the project activity demonstrates prior consideration of CDM by the Project Developer.	Ok	OK
b. Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds)?	VVM	102	Evidence of ERPA and signed date is not Provided	CL 12	Ok
c. evidence of agreements or negotiations with a DOE for validation services?	VVM	102	Validation with BVC started 11/08/2010	Ok	OK
d. submission of a new methodology to the CDM Executive Board?	VVM	102	N/A		
e. publication in newspaper?	VVM	102	None	Ok	OK
f. interviews with DNA?	VVM	102			
g. earlier correspondence on the project with the DNA or the UNFCCC secretariat?	VVM	102	Notification of CDM consideration sent to UNFCCC and DNA dated 20/11/2009	Ok	OK
h. Has the chronology of events including time lines been appropriately captured and explained/detailed in the PDD?	VVM	102	Yes, table B5.6	Ok	OK
b. Identification of alternatives					
a. Does the approved methodology that is	VVM	105	No, further analysis is required through use of the additionality	Ok	

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
selected by the proposed CDM project activity prescribe the baseline scenario and hence no further analysis is required?			tool		
b. If no, does the PDD identify credible alternatives to the project activity in order to determine the most realistic baseline scenario?	VVM	105	N/A		
c. Does the list of alternatives given in the PDD ensure that:	VVM	106			
i. the list of alternatives includes as one of the options that the project activity is undertaken without being registered as a proposed CDM project activity?	VVM	106	Yes LFG 1: The project activity (i.e. capture of LFG and its flaring and/or its use) undertaken without being registered as a CDM project activity;	Ok	OK
ii. the list contains all plausible alternatives that the DOE, on the basis of its local and sectoral knowledge, considers to be viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity?	VVM	106	Yes, based on studies and use of specific expertise, we deem the elaborated alternatives as viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity	Ok	OK
iii. the alternatives comply with all applicable and enforced legislation?	VVM	106	Yes	Ok	OK
c. Investment analysis					
a. Has investment analysis been used to demonstrate the additionality of the proposed CDM project activity?	VVM	107	Yes.		OK
d. If yes, does the PDD provide evidence	VVM	107			OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
that the proposed CDM project activity would not be:					
i. the most economically or financially attractive alternative?	VVM	107	Not applicable.		NA
ii. economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs)?	VVM	107	Yes.		OK
b. Was this shown by one of the following approaches?	VVM	108	See below.		OK
i. The proposed CDM project activity would produce no financial or economic benefits other than CDM-related income. Document the costs associated with the proposed CDM project activity and the alternatives identified and demonstrate that there is at least one alternative which is less costly than the proposed CDM project activity.	VVM	108	Not applicable.		NA
ii. The proposed CDM project activity is less economically or financially attractive than at least one other credible and realistic alternative.	VVM	108	Not applicable.		NA
iii. The financial returns of the proposed CDM project activity would be insufficient to justify the required investment.	VVM	108	Yes.		OK
c. Is the period of assessment limited to the	EB 51	Ann	No.		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
proposed crediting period of the CDM project activity?		58			
d. Does the project IRR and equity IRR calculations reflect the period of expected operation of the underlying project activity (technical lifetime), or - if a shorter period is chosen - include the fair value of the project activity assets at the end of the assessment period?	EB 51	Ann 58	Provide evidences to support the period of expected operation used in the investment analysis. The primary hardware is comprised of: - Electrical generators: The LFG generators have an anticipated life of 10-15 years depending on operational conditions, fuel quality (in the form of LFG), and the maintenance regime adopted. Please refer to PDD section A.4.3 p.6. This is further supported by a 3rd party opinion (Golder Associates' "Technical Due Diligence Report", p.59), the relevant pages of which are attached with this response; - Gas collection and Flaring system: The technical lifetime is 20 years. Please refer to p. 8 of "Landfill Gas Capture Design vs. Actual Performance and the Future for CDM Projects", organised by the World Bank. The relevant pages of this report are attached with this response.	CAR 18	Ok
e. Does the IRR calculation include the cost of major maintenance and/or rehabilitation if these are expected to be incurred during the period of assessment?	EB 51	Ann 58	Yes.		OK
f. Do the project participants justify the appropriateness of the period of assessment in the context of the underlying project activity, without reference to the proposed CDM crediting period?	EB 51	Ann 58	Refer to CAR 18	CAR 18	OK
g. Does the cash flow in the final year	EB 51	Ann	Refer to CAR 18	CAR 18	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
include a fair value of the project activity assets at the end of the assessment period?		58			
h. Has the fair value been calculated in accordance with local accounting regulations where available, or international best practice?	EB 51	Ann 58	Refer to CAR 18	CAR 18	OK
i. Does the fair value calculations include both the book value of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets?	EB 51	Ann 58	Refer to CAR 18	CAR 18	OK
j. Was depreciation, and other non-cash items related to the project activity, which have been deducted in estimating gross profits on which tax is calculated, added back to net profits for the purpose of calculating the financial indicator (e.g. IRR, NPV)?	EB 51	Ann 58	N/A since pre-tax WACC and pre-tax IRR has been used		OK
k. Has taxation been included as an expense in the IRR/NPV calculation in cases where the benchmark or other comparator is intended for post-tax comparisons?	EB 51	Ann 58	N/A since pre-tax WACC and pre-tax IRR has been used		OK
e. Are the input values used in all investment analysis valid and applicable at the time of the investment decision taken by the project participant?	EB 51	Ann 58	Clarify with evidences the moment of investment decision, in order to guarantee that the input values are the correct ones at this moment in the project chronology.	CAR 23	Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			As per EB41 guidance, "the start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity [i.e. investment decision...or purchase order for project hardware]" ('point of on-return') (EB41). The Purchase Order for LFG to Energy Generator (dated 29/05/2009) is included with this response. The name of the PDF document is: "090529 - PO Generators".		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
l. Is the timing of the investment decision consistent and appropriate with the input values?	EB 51	Ann 58	Refer to CAR 23	CAR 23	Ok
m. Are all the listed input values been consistently applied in all calculations?	EB 51	Ann 58	Yes.		OK
n. Does the investment analysis reflect the economic decision making context at point of the decision to recommence the project in the case of project activities for which implementation ceases after the commencement and where implementation is recommenced due to consideration of the CDM?	EB 51	Ann 58	Not applicable.		NA
o. Have project participants supplied the spreadsheet versions of all investment analysis?	EB 51	Ann 58	Yes.		OK
p. Are all formulas used in this analysis readable and all relevant cells be viewable and unprotected?	EB 51	Ann 58	Yes.		OK
q. In cases where the project participant does not wish to make such a spreadsheet available to the public has the PP provided an exact read-only or PDF copy for general publication?	EB 51	Ann 58	Yes, PP will provide an exact read-only copy for general publication		OK
r. In case the PP wishes to black-out certain elements of the publicly available version, is it justifiable?	EB 51	Ann 58	Not applicable.		OK
f. Was the cost of financing expenditures (i.e. loan repayments and interest)	EB 51	Ann 58	Yes.		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
included in the calculation of project IRR?					
g. In the calculation of equity IRR, has only the portion of investment costs which is financed by equity been considered as the net cash outflow?	EB 51	Ann 58	N/A since a pre-tax WACC and IRR have been used		OK
s. Has the portion of the investment costs which is financed by debt been considered a cash outflow in the calculation of equity IRR? (this is not allowed)	EB 51	Ann 58	No.		OK
t. Was a pre-tax benchmark be applied?	EB 51	Ann 58	Yes		OK
u. In cases where a post-tax benchmark is applied, is actual interest payable taken into account in the calculation of income tax?	EB 51	Ann 58	Not applicable.	NA	
v. In such situations, was interest calculated according to the prevailing commercial interest rates in the region, preferably by assessing the cost of other debt recently acquired by the project developer and by applying a debt-equity ratio used by the project developer for investments taken in the previous three years?	EB 51	Ann 58	Not applicable.	NA	
w. In cases where a benchmark approach is used is the applied benchmark appropriate to the type of IRR calculated?	EB 51	Ann 58	It was not used the guidelines on the assessment of investment analysis version 4 to determine the benchmark. Moreover the benchmark is not in accordance with the referred annex in regard to: - equity cost	CAR 19	Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			- debt to asset and equity to asset ratios - cost of debt A CAR was raised to client to provide evidence for benchmark approach. The answer was accepted because the benchmark has calculated by using best financial practices, based on data sources which can be clearly validated by the DOE.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
x. Has local commercial lending rates or weighted average costs of capital (WACC) selected as appropriate benchmarks for a project IRR?	EB 51	Ann 58	Refer to CAR 19		Ok
h. Has required/expected returns on equity selected as appropriate benchmark for an equity IRR?	EB 51	Ann 58	Refer to CAR 19	CAR 19	Ok
y. In case benchmarks supplied by relevant national authorities selected is it applicable to the project activity and the type of IRR calculation presented?	EB 51	Ann 58	Not applicable.		
z. In the cases of projects which could be developed by an entity other than the project participant is the benchmark applied based on publicly available data sources which can be clearly validated?	EB 51	Ann 58	The benchmark is based on parameters that are standard in the market. The benchmark has been calculated using publicly available information only.		
aa. Have internal company benchmarks/expected returns (including those used as the expected return on equity in the calculation of a weighted average cost of capital - WACC) been applied in cases where there is only one possible project developer?	EB 51	Ann 58	Refer to CAR 19	CAR 19	OK
bb. In such cases, have these values been used for similar projects with similar risks, developed by the same company or, if the company is brand new, would have been used for similar projects in the same sector in the country/region?	EB 51	Ann 58	Refer to CAR 19	CAR 19	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
cc. Has a minimum clear evidence of the resolution by the company's Board and/or shareholders been provided to the effect as above?	EB 51	Ann 58	Refer to CAR 19	CAR 19	OK
dd. Has a thorough assessment of the financial statements of the project developer - including the proposed WACC - to assess the past financial behavior of the entity during at least the last 3 years in relation to similar projects been conducted?	EB 51	Ann 58	Refer to CAR 19	CAR 19	OK
ee. Does the risk premiums applied in the determination of required returns on equity reflect the risk profile of the project activity being assessed, established according to national/international accounting principles? (It is not considered reasonable to apply the rate general stock market returns as a risk premium for project activities that face a different risk profile than an investment in such indices.)	EB 51	Ann 58	Refer to CAR 19	CAR 19	OK
ff. Has an investment comparison analysis and not a benchmark analysis used when the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same (or substitute) products or services?	EB 51	Ann 58	Not applicable.		NA
gg. Have variables, including the initial	EB 51	Ann	Yes.		OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
investment cost, that constitute more than 20% of either total project costs or total project revenues been subjected to reasonable variation (positive and negative) and the results of this variation been presented in the PDD and be reproducible in the associated spreadsheets?		58			
hh. Have a corrective action been raised for a variable to be included in the sensitivity analysis which constitute less than 20% and have a material impact on the analysis ?	EB 51	Ann 58	Not applicable.		NA
ii. Is the range of variations selected is reasonable in the project context?	EB 51	Ann 58	Yes.		OK
jj. Dos the variations in the sensitivity analysis at least cover a range of +10% and -10%, unless this is not deemed appropriate in the context of the specific project circumstances?	EB 51	Ann 58	Yes.		OK
kk. In cases where a scenario will result in the project activity passing the benchmark or becoming the most financially attractive alternative, is an assessment done of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis, taking into consideration correlations between the variables as well as the specific	EB 51	Ann 58	Not applicable.		NA

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
socio-economic and policy context of the project activity?					
II. Was the plant load factor defined ex-ante in the CDM-PDD according to one of the following options:	EB 48	Ann 11	See below.		OK
i. The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval?	EB 48	Ann 11	The input values to determine the amount of energy generated by the project activity is not provided <i>A CAR was raised to PP to support input values as answered</i> - The gas model, as calculated using the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site", version 05 (EB 55); - 7,800 working hrs/yr.; and - 84% output of gensets. Ener-G have assumed 7,800 hours operational hours per genset per annum, reflecting 89% availability (i.e. marginally greater than (and consequently <i>more conservative</i>) than the 88% availability value used on other LFG projects by the same project developer, a value approved by a 3rd party technical consultant ("Golder Associates"). Please refer to p.137 of "Technical Due Diligence Report". The relevant pages of this report are attached with this response. All evidences have been checked and all values were validated.	CAR 20	Ok
ii. The plant load factor determined by	EB 48	Ann	Refer to CAR 20	CAR 20	

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
a third party contracted by the project participants (e.g. an engineering company)?		11			
mm. Was a thorough assessment of all parameters and assumptions used in calculating the relevant financial indicator, and determine the accuracy and suitability of these parameters using the available evidence and expertise in relevant accounting practices conducted?	VVM	110	Yes.		OK
nn. Were the parameters cross-checked against third-party or publicly available sources, such as invoices or price indices?	VVM	110	Provide a spreadsheet containing all the assumptions and input values used in the investment analysis with its respective description and provide the evidences to justify the respective evidence, the description of the evidence and evidence's date. Make sure that all information and evidences are based on the relevant information available at the time of the investment decision and not information available at an earlier or later point. (Total investment, energy price, plant load factor, O&M costs and among others) A CAR was raised on this issue and closed upon provision of satisfactory evidences and references Provide the referred documents in order to check and cross-check the following input values in the investment analysis: - CAPEX - OPEX	CAR 21	Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			- Revenue For CAPEX: - "29 05 2009 purchase order for generators"; - Derating Spec - G3516 Dry Manifold 1136kWe Engine Spec.; For OPEX: - "16 01 2010 Ener-G Systems letter including operating cost experience statement"; DSW letter (confirming O&M cost for Durban Landfill) (Ref Cat2-/64/) Golder Associates Report (refer highlighted sections for quick reference) (Ref Cat2-/66/) Enviroserv Contract with Ener-G (for fixed O&M cost comparison) (Ref Cat2-/65/) For Revenues: - The tariff used is per the Maximum Programme Price of Eskom's 2010-2018 Medium Term Power Purchase Programme ("MTPPP"). After 2018, an inflation corrected electricity price is employed. Please refer to the attached financial calculations. The relevant pages of Eskom's MTPPP are attached with this response. The O&M cost value is compared with a report prepared by US EPA which uses data and figures referred to the US market. A more suitable basis for determining and comparing O&M shall be provided	CL20	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
oo. Were feasibility reports, public announcements and annual financial reports related to the proposed CDM project activity and the project participants reviewed?	VVM	110	Refer to CAR 21	CAR 21 Refer CL20	Ok
pp. Was the correctness of computations carried out and documented by the project participants assessed?	VVM	110	Yes.		OK
qq. Was the sensitivity analysis by the project participants to determine under what conditions variations in the result would occur, and the likelihood of these conditions assessed?	VVM	110	Yes.		OK
rr. Is the type of benchmark applied is suitable for the type of financial indicator presented?	VVM	111	Yes.		OK
ss. Do any risk premiums applied determining the benchmark reflect the risks associated with the project type or activity?	VVM	111	Yes.		OK
tt. To determine this, was it assessed whether it is reasonable to assume that no investment would be made at a rate of return lower than the benchmark by:	VVM	111	See below.		OK
iii. assessing previous investment decisions by the project participants involved?	VVM	111	Not applicable.		NA
iv. determining whether the same benchmark has been applied?	VVM	111	Not applicable.		NA

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
v. determining if there are verifiable circumstances that have led to a change in the benchmark?	VVM	111	Not applicable.		NA
uu. Did the project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed CDM project activities?	VVM	112	Did the project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed CDM project activities? A CAR was raised on this issue and closed upon provision of satisfactory evidences and refernces The FS used values from respected national and international sources, among them: - Nedbank, one of the largest financial institutions is S. Africa (Indicative termsheets Nedbank (04 & 08/2009)); and - ABSA, one of the largest financial institutions is S. Africa (ABSA Indicative termsheet (05/05/2009)).	CAR 22	Ok
vv. If yes:	VVM	112			
i. has the FSR been the basis of the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the FSR and the investment decision is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed?	VVM	112	Refer to CAR 20	CAR 20	Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
ii. Are the values used in the PDD and associated annexes fully consistent with the FSR?	VVM	112	Refer to CAR 20	CAR 20	Ok
iii. If not, was the appropriateness of the values validated?	VVM	112	Refer to CAR 20	CAR 20	Ok
iv. On the basis of its specific local and sectoral expertise, is confirmation provided, by cross-checking or other appropriate manner, that the input values from the FSR are valid and applicable at the time of the investment decision?	VVM	112	Refer to CAR 20	CAR 20	Ok
d. Barrier analysis					
a. Has barrier analysis been used to demonstrated the additionality of the proposed CDM project activity?	VVM	115	No barrier analysis is not used to demonstrated the additionality of the proposed CDM project activity		Ok
b. If yes, does the PDD demonstrate that the proposed CDM project activity faces barriers that:	VVM	115	N/A		
i. prevent the implementation of this type of proposed CMD project activity?	VVM	115	N/A		
ii. do not prevent the implementation of at least one of the alternatives?	VVM	115	N/A		
c. Are there any issues that have a clear direct impact on the financial returns of the project activity, other than: risk related barriers, for example risk of technical failure, that could have negative effects	VVM	116	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
on the financial performance; or barriers related to the unavailability of sources of finance for the project activity? {If yes, these issues cannot be considered barriers and shall be assessed by investment analysis. [Refer to (6.c) above]}					
d. Were the barriers determined as real by:	VVM	117	N/A		
i. assessing the available evidence and/or undertaking interviews with relevant individuals (including members of industry associations, government officials or local experts if necessary) to determine whether the barriers listed in the PDD exist?	VVM	117	N/A		
ii. ensuring that existence of barriers is substantiated by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics?	VVM	117	N/A		
iii. Is existence of a barrier substantiated only by the opinions of the project participants? (If yes, this barrier cannot be considered as adequately substantiated)	VVM	117	N/A		
e. Were the barriers determined as preventing the implementation of the project activity but not the implementation	VVM	117	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
of at least one of the possible alternatives by applying local and sectoral expertise to judge whether a barrier or set of barriers would prevent the implementation of the proposed CDM project activity and would not equally prevent implementation of <i>at least one of</i> the possible alternatives, in particular the identified baseline scenario?					
e. Common practice analysis					
a. Is this a proposed large-scale, or first-of-its kind small-scale project activity?	VVM	119	No proposed large-scale, or first-of-its kind small-scale project activity	Ok	OK
b. If yes, was common practice analysis carried out as a credibility check of the other available evidence used by the project participants to demonstrate additionality?	VVM	119	Yes		Ok
c. Was it assessed whether the geographical scope (e.g. defined region) of the common practice analysis is appropriate for the assessment of common practice related to the project activity's technology or industry type? (For certain technologies the relevant region for assessment will be local and for others it may be transnational/global.	VVM	120	As the proposed project type is not demonstrated to be first-of-its kind, a credibility check to complement the investment analysis (Step 2) is performed. In Country of South Africa all landfills were in scope and hence the geographical scope (e.g. defined region) of the common practice analysis is appropriate		Ok
d. Was a region other than the entire host country chosen?	VVM	120	No	Ok	OK
e. If yes, was the explanation why this	VVM	120	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
region is more appropriate assessed?					
f. Using official sources and local and industry expertise, was it determined to what extent similar and operational projects (e.g., using similar technology or practice), other than CDM project activities, have been undertaken in the defined region?	VVM	120	In the analysis of other activities similar to the proposed project activity Out of 50 potential landfill sites identified by the consultant 7 landfills analyzed, out of the seven landfills four were CDM projects (registered or in progress) this therefore means that 3 out of 50 landfills are eligible for assessment, please discuss how plausible the conclusion of the study is in view of this sample chosen Refer CL 8		Ok
g. Are similar and operational projects, other than CDM project activities, already "widely observed and commonly carried out" in the defined region?	VVM	120	453 sites were operational or in the process of being issued permits. Site selection process led to the evaluation of 57 sites throughout South Africa to determine their potential to product LFG electrical energy. These were sites neighbouring Metropolitan areas with potential for LFG recovery. By tabulating the identified 57 sites on basis of size, tonnage input of solid wastes and the potential landfill gas that may be extracted from each site, a list of twenty landfills in descending order of potential	Ok	OK
h. If yes, was it assessed whether there are essential distinctions between the proposed CDM project activity and the other similar activities?	VVM	120	N/A	Ok	OK
7. Monitoring plan					
a. Does the PDD include a monitoring plan?	VVM	122	Yes in section B.7.2 and Annex 4 of PDD	Ok	OK
b. Is this monitoring plan based on the approved monitoring methodology applied to the proposed CDM project	VVM	122	Yes		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
activity? c. Were the list of parameters required by the the selected methodology identified?	VVM	123	Yes, $LFG_{total,y}$ = Total amount of LFG captured at Normal Temperature and Pressure $LFG_{flare,y}$ = Amount of LFG flared at Normal Temperature and Pressure $LFG_{electricity,y}$ = Amount of LFG combusted in power plants at Normal Temperature and Pressure $PE_{flare,y}$ = Project emissions from flaring of the residual gas stream in year y w_{CH4} = Methane fraction in the landfill gas EL_{LFG} = Net amount of electricity generated using LFG Operation of the energy plant = Operation of the energy plant in a year y $PE_{EC,y}$ = Project emissions from electricity consumption by the project activity during the year y $PE_{FC,j,y}$ = Project emissions from fossil fuel combustion in fossil fuel based generators during the year y T_{flare} = Temperature in the exhaust gas of the flare Other flare operational parameters = Includes all data and parameters that are required to monitor whether the flare operates within the range of operating conditions according to manufacturer's specifications. $EC_{PJ,j,y}$ = Onsite consumption of electricity attributable to the project activity during the year y $FC_{i,j,y}$ = Amount of diesel combusted to meet power requirements of project	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
d. Does the monitoring plan contains all necessary parameters?	VVM	123	Yes		
e. Are the parameters clearly described?	VVM	123	Yes		
f. Do the means of monitoring described in the plan comply with the requirements of the methodology?	VVM	123	Yes and according to CDM METHODOLOGY BOOKLET parameters to be Monitored are; • Amount of landfill gas captured; • Methane fraction in the landfill gas; • If applicable: electricity generation using landfill gas. All of the above have been captured in the monitoring plan	Ok	OK
i. Are the amount of landfill gas generated (in m ³ , using a continuous flow meter), where the total quantity (LFG _{total,y}) as well as the quantities fed to the flare(s) (LFG _{flare,y}), to the power plant(s) (LFG _{electricity,y}), sent to pipeline for feeding to the natural gas distribution network (LFG _{PL,y}), and to the boiler(s)/air heater(s)/heat generating equipment(s) (LFG _{thermal,y}) measured continuously?	ACM	0001	Yes. However (LFG _{thermal,y}) will not be measured continuously because no methane will be combusted in a boiler/air heater/heat generating equipment.	Ok	OK
ii. In the case where LFG is just flared, and if one flow meter for each flare is used, are those meters calibrated periodically by an officially accredited entity ?	ACM	0001	Yes, though procedures for the same will be developed	Ok	OK
iii. Is the fraction of methane in the landfill gas (W _{CH₄,y}) measured with a continuous analyzer ?	ACM	0001	Yes		
iv. In all cases, are methane fraction of the landfill gas and LFG flow measured on same basis (either wet or dry) ?	ACM	0001	Yes. are methane fraction of the landfill gas and LFG flow measured on same basis (wet)	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
v. In case the “Tool to determine project emissions from flaring gases containing methane” is used, are the standard approaches to convert the flow on wet basis to dry basis followed (such as the procedures provided in the book “Fundamentals of Classical Thermodynamics”; Gordon J. Van Wylen, Richard E. Sonntag and Claus Borgnakke; 4o Edition, 1994, John Wiley & Sons, Inc) ?	ACM	0001	Transparently documentation of the approach/technology used to convert the flow on wet basis to dry basis followed is not provided	CL 13	Ok
vi. Are the parameters used for determining the project emissions from flaring of the residual gas stream in year y ($PE_{flare,y}$) monitored as per the “Tool to determine project emissions from flaring gases containing methane”?	ACM	0001	Yes Manufacturer specifications will be monitored	Ok	OK
vii. Are temperature (T) and pressure (p) of the landfill gas measured to determine the density of methane in the landfill gas?	ACM	0001	Yes, however as per PDD normalized flow meters are used hence no independent monitoring of T and P	Ok	OK
viii. Are the quantities of fossil fuels required to operate the landfill gas project, including the pumping equipment for the collection system and	ACM	0001	Yes, the quantities of fossil fuels required to operate the landfill gas project, including the pumping equipment for the collection system is monitored	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
energy required to transport heat monitored ?					
ix. In projects where LFG gas is captured in the baseline to either meet the regulation or for safety reason, is fossil fuel used in the baseline recorded too ?	ACM	0001	N/A	Ok	OK
x. Is the quantity of electricity imported, in the baseline and the project situation, to meet the requirements of the project activity, if any, monitored?	ACM	0001	N/A		
xi. Is the quantity of electricity exported out of the project boundary, generated from landfill gas, if any, monitored?	ACM	0001	Yes	Ok	OK
xii. Will relevant regulations for LFG project activities be monitored and updated at renewal of each credit period?	ACM	0001	Yes, The information will be monitored annually, however it will only be used for changes to MD _{BL,y} at the renewal of the crediting period.	Ok	OK
1. Will changes to regulation be converted to the amount of methane that would have been destroyed/combusted during the year in the absence of the project activity (MD _{BL,y}).?	ACM	0001	Yes At the time of renewal of crediting period, ER shall be calculated accordingly in case new regulations are formulated requiring mandatory capture, flaring or destruction of LFG.	Ok	OK
2. Have project participants explained how regulations are translated into that amount of gas ?	ACM	0001	Yes	Ok	OK
xiii. Will the operating hours of the energy plant(s) and the boiler(s)/air heater(s)/heat generating equipment(s)	ACM	0001	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
be monitored ?					
xiv. As the measurement equipment for gas quality (humidity, particulate, etc.) is sensitive, is a sufficiently strong QA/QC procedure for the calibration of this equipment defined ?	ACM	0001	However the procedure is yet to be developed this is captured in the monitoring plan annex 4 as part of QA/QC	Ok	OK
xv. Is there a continuous monitoring system for methane fraction of the landfill gas and LFG flow, defined as follows?	ACM	0001			
1. Does the continuous monitoring system continuously acquire data from the process (continuous sampling) in order to process it and deliver the required information (methane fraction of the landfill gas and LFG flow) as an average value in a time interval not greater than an hour. Paired values of the methane fraction of the landfill gas and LFG flow which are averaged for the same time interval should be used in the calculation of emission reductions (i.e. methane fraction of landfill gas averaged at hour x should be used with LFG flow which is averaged at the same hour x)?	ACM	0001	Transparently detail the data processing arrangements for LFG continuously monitoring system	CL 14	Ok
2. Are paired values of the methane fraction of the landfill gas and LFG flow averaged for the same time interval (i.e. methane fraction of	ACM	0001	~~Pending on CL above~~ Yes, Methane content will be measured directly with a continuous gas analyser (i.e. at least hourly), by the	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
landfill gas averaged at hour x should be used with LFG flow which is averaged at the same hour x)?			Project Developer. Values to be averaged hourly or at a short time interval (with permissible accuracy of 2% at full scale)		
3. Are paired values of the methane fraction of the landfill gas and LFG flow used in the calculation of emission reductions ?	ACM	0001	~~Pending on CL above~~ Ok	Ok	OK
xvi. Will the data and parameters required by the methodology be monitored adequately ?	ACM	0001			
1. Will LFG _{total,y} total amount of landfill gas captured at Normal Temperature and Pressure be monitored, according to the following ?	ACM	0001			
1. Is the unit in m ³ ?	ACM	0001	Unit in Nm3	Ok	OK
2. Will it be measured by a flow meter?	ACM	0001	Yes calibrated and normalized flow meter	Ok	OK
3. Will data be aggregated monthly and yearly for each boiler/air heater/heat generating equipment?	ACM	0001	N/A	Ok	OK
4. Will the monitoring be continuous (average value in a time interval not greater than an hour shall be used in the calculations of	ACM	0001	~~Pending on CL above~~ Average value is one hour	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
emission reductions)?					
5. Will flow meters be subject to a regular maintenance and testing regime to ensure accuracy ?	ACM	0001	Yes and as per the manufacturer specifications	Ok	OK
2. Will $PE_{flare,y}$, project emissions from flaring of the residual gas stream in year y be monitored, according to the following ?	ACM	0001			
1. Is the unit in tCO_{2e} ?	ACM	0001	Yes	Ok	OK
2. Will data sources be as per the «Tool to determine project emissions from flaring gases containing methane » ?	ACM	0001	Parameters for the Tool to determine project emissions from flaring gases containing methane in Document in PDD monitoring plan		Ok
3. Are measurement procedures as per the «Tool to determine project emissions from flaring gases containing methane » ?	ACM	0001	~~Pending on CL above~~ Yes, measurement procedures as per the «Tool to determine project emissions from flaring gases containing methane »	Ok	OK
4. Is monitoring frequency as per the «Tool to determine project emissions from flaring gases containing methane » ?	ACM	0001	~~Pending on CL above~~ Yes, monitoring frequency is as per the «Tool to determine project emissions from flaring gases containing methane »	Ok	OK
5. Are QA/QC procedures as per the «Tool to determine project emissions from flaring gases containing methane »?	ACM	0001	~~Pending on CL above~~ Yes, QA/QC procedures as per the «Tool to determine project emissions from flaring gases containing methane »	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
3. Will w_{CH_4} , methane fraction in the landfill gas be monitored, according to the following ?	ACM	0001			
1. Is the unit in $m^3 CH_4/m^3 LFG$?	ACM	0001	Yes (normalized)	Ok	OK
2. Will it be measured by project participants using a certified gas quality analyser?	ACM	0001	Methane content will be measured directly with a continuous gas analyser (i.e. at least hourly), by the Project Developer. Values to be averaged hourly or at a short time interval (with permissible accuracy of 2% at full scale).	Ok	OK
3. Can the measuring equipment directly measure methane content in the landfill gas, as estimation of methane content of landfill gas based on measurement of other constituents of the landfill gas such as CO_2 is not permitted ?	ACM	0001	Yes, it measures directly	Ok	OK
4. Will the monitoring be continuous (average value in a time interval not greater than an hour shall be used in the calculations of emission reductions) ?	ACM	0001	Information on the measurement methods for continually monitoring w_{CH_4} is not provided in PDD,	CL19	Ok
5. Will the gas analyser be subject to a regular maintenance and testing regime to ensure accuracy ?	ACM	0001	Yes	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
4. Will T, temperature of the landfill gas be monitored, according to the following ?	ACM	0001			
1. Is the unit in °C ?	ACM	0001	N/A		
2. Will it be measured by project participants, in order to determine the density of methane D _{CH4} (no separate monitoring of temperature is necessary when using flow meters that automatically measure temperature and pressure, expressing LFG volumes in normalized cubic meters) ?	ACM	0001	T: Flow meters will express LFG volumes in normalised cubic meters, therefore no separate monitoring of temperature is necessary	Ok	OK
3. Will the monitoring be continuous ?	ACM	0001	Yes		
4. Will measuring instruments be subject to a regular maintenance and testing regime in accordance to appropriate national/international standards ?	ACM	0001	Yes		
5. Will P, pressure of the landfill gas be monitored, according to the following ?	ACM	0001	N/A		
1. Is the unit in Pa ?	ACM	0001			
2. Will it be measured by project	ACM	0001	No, P: Flow meters will express LFG volumes in normalised	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
participants, in order to determine the density of methane D_{CH_4} (no separate monitoring of temperature is necessary when using flow meters that automatically measure temperature and pressure, expressing LFG volumes in normalized cubic meters) ?			cubic meters, therefore no separate monitoring of pressure is necessary		
3. Will the monitoring be continuous ?	ACM	0001	As above for T		
4. Will measuring instruments be subject to a regular maintenance and testing regime in accordance to appropriate national/international standards ?	ACM	0001	Yes		Ok
6. Will EL_{LPG} , net amount of electricity generated using LFG be monitored, according to the following ?	ACM	0001			
1. Is the unit in MWh ?	ACM	0001	Yes		Ok
2. Will it be measured by project participants, in order to estimate the emission reductions from electricity generation from LFG, if credits are claimed ?	ACM	0001	Yes, when project phase two generation of electricity is attained	Ok	OK
3. Will the monitoring be continuous	ACM	0001	Yes using electricity meters	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
?					
4. Will the electricity meter be subject to regular (in accordance with stipulation of the meter supplier) maintenance and testing to ensure accuracy ?	ACM	0001	Yes in accordance to meter supplier Electricity will be monitored continuously using electricity meter(s) of Class 0.5.	Ok	OK
7. Will ET _{LPG} , total amount of thermal energy generated using LFG be monitored, according to the following ?	ACM	0001	No thermal energy will be generated by this project	Ok	OK
1. Is the unit in TJ ?	ACM	0001	N/A		
2. Will it be measured by project participants, in order to estimate the emission reductions from thermal energy generation from LFG, if credits are claimed ?	ACM	0001	N/A		
3. In case of steam meter, will the enthalpy of steam and feed water be determined at measured temperature and pressure and the enthalpy difference multiplied with quantity measured by steam meter?	ACM	0001	N/A		
4. In case of hot air: will the temperature, pressure and mass flow rate be measured ?	ACM	0001	N/A		
5. In case of monitoring of steam,	ACM	0001	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
will the meter be calibrated for pressure and temperature of steam at regular intervals ? The meter shall be subject to regular maintenance and testing to ensure accuracy?					
6. Will the meter be subject to regular maintenance and testing to ensure accuracy ?	ACM	0001	N/A		
8. Will $CEF_{elec,y}$ carbon emission factor of electricity be monitored, according to the following ?	ACM	0001	$CEF_{elec,y}$ is not monitored, as ex ante option is used to determine simple OM	Ok	OK
1. Is the unit in tCO ₂ /MWh ?	ACM	0001	N/A		
2. Do project participants use the option to apply a default of 0.8 if electricity in the baseline would have been produced using captive power plant ?	ACM	0001	N/A		
3. Else, is equation 8 used to provide the estimation equation?	ACM	0001	N/A		
4. In case the baseline source would have been grid, is the emission factor estimated as described in “Tool to calculate the emission factor for an electricity system”?	ACM	0001	Yes, the emission factor estimated as described in the latest version of “Tool to calculate the emission factor for an electricity system”	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
5. Will it be estimated annually ?	ACM	0001	No, option A ex ante method to determine emission factor is used.		
9. Will $EF_{fuel,BL}$, CO ₂ emission factor of fossil fuel (that would have been used in the baseline captive power plant or thermal energy generation) be monitored, according to the following ?	ACM	0001	No fossil fuel was used in baseline captive power plant or thermal generation.	Ok	OK
1. Is the unit in tCO ₂ /MWh ?	ACM	0001	N/A		
2. Is the source of data the following, in order of preference:	ACM	0001	N/A		
a. project specific data ?	ACM	0001	N/A		
b. country specific data?	ACM	0001	N/A		
c. IPCC default values, to be used only when country or project specific data are not available or difficult to obtain?	ACM	0001	N/A		
3. Will it be reviewed annually ?	ACM	0001	N/A		
10. Will $NCV_{fuel,BL}$, net calorific value of fossil fuel (that would have been used in the baseline captive power plant or thermal energy generation) be monitored, according to the following ?	ACM	0001	No fossil fuel was used in the baseline for thermal energy generation and/or electricity generation	Ok	OK
1. Is the unit in GJ/mass or volume	ACM	0001	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
units of fuel ?					
2. Is the source of data the following, in order of preference:	ACM	0001	N/A		
a. project specific data ?	ACM	0001	N/A		
b. country specific data?	ACM	0001	N/A		
c. IPCC default values, to be used only when country or project specific data are not available or difficult to obtain?	ACM	0001	N/A		
3. Will it be reviewed annually ?	ACM	0001	N/A		
11. Will $\epsilon_{\text{gen,BL}}$, efficiency of the baseline captive power plant be monitored, according to the following ?	ACM	0001	No baseline captive power plant was used	Ok	OK
1. Is the unit dimensionless ?	ACM	0001	N/A		
2. To estimate electricity generation efficiency, do project participants use the highest value among the following three values as a conservative approach:	ACM	0001	N/A		
a. Measured efficiency prior to project implementation?	ACM	0001	N/A		
b. Measured efficiency during monitoring?	ACM	0001	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
c. Data from manufacturer for efficiency at full load	ACM	0001	N/A		
d. Default efficiency of 60%. ?	ACM	0001	N/A		
3. Will it be reviewed annually ?	ACM	0001	N/A		
12. Will $\epsilon_{\text{boiler/air heater}}$, efficiency of the baseline boiler/air heater for producing thermal energy be monitored, according to the following ?	ACM	0001	No baseline boiler/air heater was used in production of thermal energy	Ok	OK
1. Is the unit dimensionless ?	ACM	0001	N/A		
2. To estimate boiler efficiency, do project participants use one of the following two options ?	ACM	0001	N/A		
3. Is option A used, where the highest value among the following three values is applied as a conservative approach?	ACM	0001	N/A		
a. Measured efficiency prior to project implementation?	ACM	0001	N/A		
b. Measured efficiency during monitoring?	ACM	0001	N/A		
c. Manufacturer's information on the boiler efficiency ?	ACM	0001	N/A		
4. Is option B used, where a boiler	ACM	0001	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
efficiency of 100% is assumed, based on the net calorific values as a conservative approach?					
5. Will it be reviewed annually ?	ACM	0001	N/A		
13. Will the hours of operation of energy plant be monitored, according to the following ?	ACM	0001	Yes		OK
1. Is the unit in hours ?	ACM	0001	Yes		OK
2. Will they be monitored by project participants, in order to ensure methane destruction is claimed for methane used in electricity plant when it is operational	ACM	0001	Yes		OK
3. Will it be monitored annually ?	ACM	0001	Yes		OK
14. Will the hours of operation of the boiler/heater/heat generating equipment be monitored, according to the following ?	ACM	0001	N/A		
1. Is the unit in hours ?	ACM	0001	N/A		
2. Will they be monitored by project participants, in order to ensure methane destruction is claimed for methane used in boiler/heater/heat generating equipment when it is operational ?	ACM	0001	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
3. Will it be monitored annually ?	ACM	0001	N/A		
15. Will $PE_{EC,y}$, project emissions from electricity consumption by the project activity during the year y be monitored, according to the following ?	ACM	0001			
1. Is the unit in tCO ₂ e ?	ACM	0001	Yes	Ok	OK
2. Will data sources be as per the «Tool to calculate baseline, project and/or leakage emissions from electricity consumption»?	ACM	0001	Yes data sources will be as per the «Tool to calculate baseline, project and/or leakage emissions from electricity consumption»	Ok	OK
3. Are measurement procedures as per the « Tool to calculate baseline, project and/or leakage emissions from electricity consumption »?	ACM	0001	Yes measurement procedures are as per the « Tool to calculate baseline, project and/or leakage emissions from electricity consumption »	Ok	OK
4. Is monitoring frequency as per the « Tool to calculate baseline, project and/or leakage emissions from electricity consumption »?	ACM	0001	Yes monitoring frequency corresponds with the « Tool to calculate baseline, project and/or leakage emissions from electricity consumption »	Ok	OK
5. Are QA/QC procedures as per the « Tool to calculate baseline, project and/or leakage emissions from electricity consumption »?	ACM	0001	QA/QC procedures are as per the « Tool to calculate baseline, project and/or leakage emissions from electricity consumption »	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
16. Will $PE_{FC,j,y}$, project emissions from fossil fuel combustion in process j during the year y be monitored, according to the following ?	ACM	0001			
1. Is the unit in tCO ₂ e ?	ACM	0001	Yes unit in tCO ₂ e	Ok	OK
2. Will data sources be as per the «Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion» ?	ACM	0001	data sources will be as per the «Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion»		OK
3. Are measurement procedures as per the « Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion » ?	ACM	0001	Measurement procedures are as per the « Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion »	Ok	OK
4. Is monitoring frequency as per the « Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion »?	ACM	0001	Monitoring frequency is as per the « Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion »	Ok	OK
5. Are QA/QC procedures as per the Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion »?	ACM	0001	QA/QC procedures are as per the Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion »	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
17. Will $MG_{PR,y}$, amount of methane generated during year y of the project activity be monitored, according to the following ?	ACM	0001	Not applicable as Project is not mandated by contracts/regulations to a specific system for collection and destruction of methane and therefore MDBL is not based on calculation of AF Thus parameters relating to determination of AF (including $MG_{PR,y}$) do not form a part of the monitoring plan in the PDD	Ok	OK
1. Is the unit in tCH_4 ?	ACM	0001	N/A		
2. Is it estimated using the actual amount of waste in the landfill as per the latest version of the « Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site » ?	ACM	0001	N/A		
3. Will it be estimated annually ?	ACM	0001	N/A		
4. Are QA/QC procedures as per the « Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site » ?	ACM	0001	N/A		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
g. Are the monitoring arrangements described in the monitoring plan feasible within the project design?	VVM	122	Yes, along with proposed associated procedures to be established for expost monitoring	Ok	OK
h. Are the following means of implementation of the monitoring plan sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified:	VVM	122			
i. data management procedures?	VVM	122	Yes, the project will employ as part of CDM Monitoring System Procedures specific monitoring for CDM Staff training CDM data and record keeping arrangements / day-to-day records handling CDM data quality control and quality assurance Internal audits Equipment failure Equipment calibration	Ok	OK
ii. quality assurance procedures?	VVM	122	As above	Ok	OK
iii. quality control procedures?	VVM	122	As above	Ok	OK
8. Sustainable development					
a. Does the CDM project activity assists Parties not included in Annex I to the Convention in achieving sustainable development?	VVM	125	~~Pending on CL1~~ Yes, the project assists South Africa		Ok
b. Does the letter of approval by the DNA of	VVM	126	~~Pending on CL1~~		Ok

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the host Party confirm the contribution of the proposed CDM project activity to the sustainable development of the host Party?			Yes, Letter from South Africa DNA confirm the contribution of the proposed CDM project activity to the sustainable development of the host Party		
9. Local stakeholder consultation					
a. Were local stakeholders (public, including individuals, groups or communities affected, of likely to be affected, by the proposed CDM project activity or actions leading to the implementation of such an activity) invited by the PPs to comment on the proposed CDM project activity prior to the publication of the PDD on the UNFCCC website?	VVM	128	The NEMA EIA Regulations require that a site notice available to the public at the site where the proposed project activity a photo of the notices placed in strategic locations were available at site visit: The purpose of the site notices was to notify the public of the project and to invite Stakeholder and I&APs to register or attend the Public Meeting. Refer “App C_Site Notice Ennerdale” for a copy of the site notices NEMA EIA Regulations require that an advertisement be placed in either a local newspaper or a Government Gazette. Should the project have a potential impact that extends beyond the boundaries of the metropolitan or local municipality, the project should be advertised within at least one provincial or national newspaper. For the proposed project WSP placed an advertisement in a national newspaper. Refer to “App E_Citizen newspaper advertisement” for a copy of the newspaper advertisement placed in the Citizen on: 19 February 2009 A Public Meeting was held before the Authorities meeting at the Ennerdale Civic Centre on the 27th February 2009 from 17h00 to 18h00. The aim of the	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Authorities meeting and the Public Meeting was to outline the details of the project and provide an opportunity for the Authorities, stakeholders and I&APs to raise issues, concerns and queries related to the project. Furthermore, they established a line of communication between the Authorities, stakeholders, I&APs and the project team. Please refer to “App G_AppB Public Meeting Attendance Register” for the attendance register and meeting minutes from the Public and Authorities meeting.		

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
b. Have comments by local stakeholders that can reasonably be considered relevant for the proposed CDM project activity been invited?	VVM	129	Yes, this can be confirmed as appropriate from the scoping reports performed in June 2009	Ok	OK
c. Is the summary of the comments received as provided in the PDD complete?	VVM	129	Pending on page 37 clarification		Ok
d. Have the project participants taken due account of any comments received and described this process in the PDD?	VVM	129	Pending on page 37 clarification		Ok
10. Environmental impacts					
a. Have the project participants submitted documentation on the analysis of the environmental impacts of the project activity?	VVM	131	An EIA must be undertaken in accordance EIA Regulations of the NEMA. These regulations came into effect on the 3rd of July 2006 and all EIA processes and applications need to be undertaken in accordance with these regulations. The DEAT is the lead Authority. The EIA regulations under the NEMA envisage two categories of activities: Schedule 1 and Schedule 2 activities are those that will require both Scoping and an EIA. The project requires a full EIA process will be undertaken. This process involves the following phases: ■ Submission of an EIA Application Authorisation (submitted on 30 March 2009), Reference Number 12/12/20/1472; ■ Compilation and submission of a Scoping Report (submitted on 5 June 2009), which included a Plan of Study for the EIA	Ok	OK

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			- Public Participation Process (PPP) (undertaken for the duration of the project); and - A comprehensive EIA Report and a Draft Environmental Management Plan (EMP).		
b. Have the project participants undertaken an analysis of environmental impacts?	VVM	132	Yes by way of a comprehensive EIA Report and a Draft Environmental Management Plan (EMP).	Ok	OK
c. Does the host Party require an environmental impact assessment?	VVM	132	Yes an EIA must be undertaken in accordance EIA Regulations of the NEMA. These regulations came into effect on the 3rd of July 2006 and all EIA processes and applications need to be undertaken in accordance with these regulations. The DEAT is the lead Authority.	Ok	OK
d. If yes, have the project participants undertaken an environmental impact assessment?	VVM	132	Yes, these are documented and evidenced as “Ennerdale DEAT Ref No.1472” “Goudkoppies DEAT Ref No. 1476” “Linbro Park DEAT Ref No. 1475” “Marie Louise DEAT Ref No. 1473” “Robinson Deep DEAT Ref No. 1474” All five reports were submitted to NEMA and evidence presented contained in letter ref: 12/12/20/1472 dated 22/06/2009 - “Acceptance letter by DEAT”	Ok	OK

Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist	Summary of project owner response	Validation team conclusion
LoA of South Africa / United Kingdom of Great Britain and Northern Ireland are not provided	CL-1	PP: 03:02:2011 In S. Africa, a draft Validation Report is a prerequisite for LoA application/issuance. DOE: 28/2/2011 Pending PP: 21 03 2011 To issue an Annex-I LoA, the host nation approval letter is required to be submitted to the UK DNA along with the LoA application. We therefore have to wait for the draft Validation Report (from you/BVC) before we can close this. Pending	LoA of Host Country has been received and found okay on review. LoA from UK has been received and confirmed as closed
The information on Addresses and GPS Coordinates for the five sites not presented in the correct section of PDD of A.4.1.4.	CAR 1	PP: 03:02:2011 This information has been moved to the correct section of the PDD (i.e. Section A.4.1.4). DOE: 28/2/2011 OK	Ok

Information as to how environmentally safe the technology is not provided	CAR 2	PP: 03:02:2011 - Regarding environmental safety of the technology, the flare system is manufactured by Biogas Technologies Ltd., and the flare technology is in accordance with stringent UK Environment Agency guidelines". During the site visit, PD furnished the DOE with soft copies of the "UK Environment Agency, 2002: Guidance on Landfill Gas Flaring", and the "Biogas Technology Ltd., Low Emission Ground Flare Systems" brochure. - Regarding Power Gensets - a soft copy of the Caterpillar Genset specifications was provided to DOE onsite; - EIA - Not required, since S. African Law does not require EIAs for such small installations, as discussed onsite. Each discrete site has power generation capabilities of less than 10 MW. DOE: 28/2/2011 More specific data relating to PDD info "...At high temperatures, proprietary Biogas Technology Group designed burners ensure full destruction of the combustible constituents found in LFG ..." will be more appropriate PP 21 03 2011: PDD section A.4.3 has been amended to include more detail. DOE: 13/04/2011 OK	Ok
--	--------------	---	-----------

Following are not provided 1) list and arrangement of the main production technologies involved 2) There is no mention of parameters to be employed in Flaring 3) power generation equipment arrangements for each site in projects lifetime 4) monitoring technology to be employed 5) arrangements for power dispatch	CAR 3	PP: 03:02:2011 1) Section A.4.3 of the PDD has been amended to include the requested information. 2) Please refer to Section B.6.1 and B.7.1 of the PDD where flaring parameters (e.g. Tflare) are discussed. 3) Discussion of power generation equipment and lifetime was undertaken in detail during the site visit, and has been added to Section A.4.3 of the PDD. 4) Section A.4.3 of the PDD has been given additional detail clarifying the monitoring technology to be employed. 5) Assuming you mean transmission (rather than “evacuation”), Section A.4.3 of the PDD has been given additional detail regarding this. DOE: 28/2/2011 For number 5, we correct to mean dispatch, information on interface between generators and grid is missing. e.g. is generator connected directly to reticulation line? PP 21 03 2011: PDD section A.4.3 has been amended (generators are directly connected to grid). DOE: 13/04/2011 Technically there would be an electrical sub-station constructed that will contain all suitable switching and metering equipment to facilitate a connection to the grid network. – this bit is missing. PP 14 04 2011: PDD section A.4.3 has been amended	Ok
The latest version of the Tool for the demonstration and assessment of additionality has not been applied	CAR 4	PP: 03/11/2011 The PDD has been updated accordingly. Ok closed	Ok reviewed closed

Sec B.3 of the CDM-PDD does not contain a clear description of the project equipment.	CL-2	PP: 03:02:2011 6) Section A.4.3 of the PDD has been amended to include the requested information. 7) Please refer to Section B.6.1 and B.7.1 of the PDD where flaring parameters (e.g. Tflare) are discussed. 8) Discussion of power generation equipment and lifetime was undertaken in detail during the site visit, and has been added to Section A.4.3 of the PDD. 9) Section A.4.3 of the PDD has been given additional detail clarifying the monitoring technology to be employed. 10) Assuming you mean transmission (rather than “evacuation”), Section A.4.3 of the PDD has been given additional detail regarding this. DOE: 28/2/2011 For number 5, we correct to mean dispatch, information on interface between generators and grid is missing. e.g. is generator connected directly to reticulation line? PP 21 03 2011: PDD section A.4.3 has been amended (generators are directly connected to grid). DOE: 13/04/2011 Electrical sub-station found missing PP 14 04 2011: PDD section A.4.3 has been amended	Ok reviewed closed
Formula to calculate project emissions is not clearly depicted one component has $(PE_y = PEEC_{y,j} + PEFC_{j,y})$ other component (eqn 15) to calculate Project emissions as provided in PDD is not easily reproducible	CL-3	PP: 03/11/2011 The project emissions calculations in Section B.6.1 of the PDD have been amended for clarity.	Ok reviewed and closed

In case of use of the default value for the methane destruction efficiency, the manufacturer's specifications for the operation of the flare and the required data and procedures to monitor these specifications should be documented in the CDM-PDD – This is not documented in PDD please provide	CAR 5	PP: 03/11/2011 Section B.7.1 of the PDD has been amended accordingly.	Ok reviewed and closed
Some data parameters (from applicable tools) are not captured in section B.7.1 Accuracy and technical specifications for metering equipment is not clear	CAR 6	PP: 03:02:2011 Section B.7.1 of the PDD has been updated to include all parameters from applicable tools and the methodology. DOE: 28/2/2011 OK	Ok reviewed and closed

Organization / management structures are not provided	CAR 7	PP: 03:02:2011 Once project commissioning nears, these roles will be defined, and an organisational/management structure finalised. This is stated at the end of PDD Section B.7.2. DOE: 28/2/2011 Pending PP 21 03 2011: As already stated, the project is not yet operational. As commissioning nears, roles will be defined, and responsibilities will be assigned to staff involved in the CDM project. A more detailed description of roles, responsibilities, and capacity building efforts will be provided in the Monitoring Manual and will be made available to the DOE during verification. Since the project is not implemented completely, the information in the PDD is as per the Project Developer's latest update. DOE: 13/04/2011 Pending PP 14 04 2011: A draft organogram (PDF titled "Joburg LF draft organogram 14 04 2011") for the five sites will accompany this response, but cannot be included in the PDD because it is not final, and the Project Developer cannot be bound by this organogram (which would be the case, should the document become part of the registered CDM project PDD).	Ok reviewed and closed
---	-------	---	------------------------

Responsibles for data collection and archiving are not provided	CAR 8	PP: 03:02:2011 Once project commissioning nears, these roles will be defined, and responsibilities finalised. This is stated at the end of PDD Section B.7.2. DOE: 28/2/2011 Pending PP 21 03 2011: As already stated, the project is not yet operational. As commissioning nears, roles will be defined, and responsibilities will be assigned to staff involved in the CDM project. A more detailed description of roles, responsibilities, and capacity building efforts will be provided in the Monitoring Manual and will be made available to the DOE during verification. Since the project is not implemented completely, the information in the PDD is as per the Project Developer's latest update. DOE: 13/04/2011 Pending PP 14 04 2011: A draft data flow chart (PDF titled "Joburg LF draft data flow chart 14 04 2011") for the five sites will accompany this response, but cannot be included in the PDD because it is not final, and the Project Developer cannot be bound by this data flow chart (which would be the case, should the document become part of the registered CDM project PDD).	Ok reviewed and closed
---	-------	---	------------------------

Monitoring plan is silent on • Process monitoring • Responsibilities • Equipment maintenance besides calibration • Calibration plan is not complete • Illustration of monitoring process is not provided	CAR 9	PP: 03:02:2011 Process monitoring, responsibilities, and illustration of monitoring process – Please refer to our response to your CL-4. Equipment maintenance - Section B.7.2 of the PDD has been updated. Calibration plan not complete – Please refer to Annex 4, where this is discussed. Please note that ALL EcoSecurities' registered LFG CDM projects employ this same template successfully. DOE: 28/2/2011 Pending, it will be more appropriate to provide a strong monitoring plan PP 21 03 2011: As already stated, the project is not yet operational. As commissioning nears, roles will be defined, and responsibilities will be assigned to staff involved in the CDM project. A more detailed description of roles, responsibilities, and capacity building efforts will be provided in the Monitoring Manual and will be made available to the DOE during verification. Since the project is not implemented completely, the information in the PDD is as per the Project Developer's latest update. DOE: 13/04/2011 Pending PP 14 04 2011: A draft organogram (PDF titled "Joburg LF draft data flow block diagram 14 04 2011") for the five sites will accompany this response, but cannot be included in the PDD because it is not final, and the Project Developer cannot be bound by this organogram (which would be the case, should the document become part of the registered CDM project PDD).	Ok reviewed and closed
--	-------	--	------------------------

It is not clear from annex 4 whether the cited procedures have been established, Further only CDM procedures have been discussed other aspects of monitoring are missing	CAR 10	PP: 03:02:2011 Annex 4 has been amended. Please note that this Annex is in line with other registered EcoSecurities CDM projects. Non-CDM monitoring aspects are detailed in response to CLs 2 & 3 (in Validation Protocol) DOE: 28/2/2011 Are the procedures in annex 4 documented? PP: 14 04 2011 Annex 4 procedures will be included in the elective monitoring support materials that will be drafted for the Project at a later date, once the Project is operational	Ok reviewed and closed
Date of completion of the application of the methodology to the project activity study is not provided in DD/MM/YYYY	CAR 11	PP: 03:02:2011 PDD has been corrected in this instance, and date format has been updated throughout project documentation to the requisite date format. DOE: 28/2/2011 OK	Ok reviewed and closed
Full contact information is not provided in B.8	CL-4	PP: 03:02:2011 As per Val. site visit discussion and agreement, Ener-G need not be listed in B.8, as all PDD baseline and monitoring methodology work has been exclusively conducted by EcoSecurities, whose contact details have been updated. DOE: 28/2/2011 OK	Ok reviewed and closed
In section B.8 Indication as to whether EcoSecurities Group Ltd is also a project participant is not provided (Ref PDD Guidance)	CAR 12	PP: 03/11/2011 Section B.8 of the PDD has been amended accordingly.	Ok reviewed and closed

Operational lifetime of the project is Up to 20 years Operational life time is not provided in years and months	CAR 13	PP 21 03 2011: The latest version of the PDD has been amended to include operational lifetime of equipment in years and months. DOE: 28/2/2011 OK Means to validate operational life time of the project, are supplied documentation; Landfill Gas Capture Design vs. Actual Performance and the Future for CDM Projects, Technical Due Diligence Report	Ok reviewed and closed
length of the first crediting period is 7 years crediting period has not been provided in years and months	CAR 14	PP 21 03 2011: The latest version of the PDD has been amended to include the crediting period in years and months. DOE: 28/2/2011 OK	Ok reviewed and closed
Identification of stakeholders that have made the comments is not provided	CAR 15	Since there are 5 sites, there were numerous stakeholder AND authority meetings. The number of attendees and the lists of queries were substantial, and were therefore provided to the DOE in soft copy during the validation site visit (as a comprehensive list of issues raised, name of stakeholder, their comment, and the respective PD response). Please refer to soft copy of folder named "Landfill Gas Utilisation Project". DOE: 13/04/2011 OK	Ok reviewed submitted files and closed
A summary of comments that were made by local stakeholders is not provided in E.2	CAR 16	PP 21 03 2011: Please refer to PDD section E.2 where a summary was indeed provided – for comprehensive details, please refer to soft copy folder named "Landfill Gas Utilisation Project", which was provided to DOE during the validation site visit. DOE: 13/04/2011 The issue and mitigation action is not provided PP 14 04 2011: Section E.2 has had further detail included regarding stakeholder questions/comments and the Project developer's respective responses	Ok reviewed and closed

PDD section E.3 provides an account of some comments from local stakeholders e.g. Air quality, Possibilities for office blocks and housing And Employment however how comments/queries in scoping report e.g. Enerdale as regards Capping of the site, effect on surface/groundwater, the technical operation of the proposed plant have not been included in PDD	CL-5	PP: 03/11/2011 Section E.3 of the PDD has been amended accordingly.	Ok reviewed and closed
Applicability condition relating to stockpiles as per "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" Version 05.1.0, adopted at EB 61.is not provided	CL-6	PP: 03:02:2011 The fact that the project is not a stockpile has been stated in Section B.2 of the PDD. DOE: 28/2/2011 This is confirmed through site visit carried out at all project landfill sites as well as through interview with Pick it Up company representative	Ok reviewed and closed
Applicability conditions relating to "Tool to calculate the emission factor for an electricity system": is not provided	CL-7	PP: 03:02:2011 The satisfaction of necessary applicability conditions regarding the "Tool to calculate the emission factor for an electricity system" (Version 2, adopted at EB 50) has been detailed in Section B.2 of the PDD. DOE: 28/2/2011 OK	Ok reviewed and closed
Latest tool "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" is not used	CAR 17	PP: 03:02:2011 The latest tool to calculate project emissions (i.e. "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site", Version 05.1.0, from EB61) has been updated throughout all project related documentation. DOE: 28/2/2011 OK reflected in B.1, B.6.1 and B.6.2 of PDD	Ok reviewed and closed

In the analysis of other activities similar to the proposed project activity Out of 50 potential landfill sites identified by the consultant 7 landfills analyzed, out of the seven landfills four were CDM projects (registered or in progress) this therefore means that 3 out of 50 landfills are eligible for assessment, please discuss how plausible the conclusion of the study is in view of this sample chosen Refer SRK Consulting study, "Landfill Gas Common Management Practice in South Africa" and the Department of Minerals and Energy, study "Landfill Gas Resources for Power Generation in South Africa"	CL-8	PP 28.11.2011 EcoSecurities' response: Indeed 57 landfills in S. Africa were defined in the SRK study by the Department of Minerals and Energy, in their 2004 "Landfill Gas Resources for Power Generation in South Africa Study". However as per the last paragraph of Section 2 ("Background") of the SRK study, only 20 of these sights are identified as possibilities for landfill gas collection. Section 5 "Discussion" of the SRK study: Of the 20 sites, only 7 responded to the survey from SRK. Of these 7, 4 are already employing landfill gas extraction and electricity generation technology, and are registered under the CDM. At the remaining 3 sites, there is either passive venting of the landfill gas, or the sites are unmanaged. Of the 13 sites that did not respond to the SRK survey, 4 are part of this Joburg Landfill project (see Table 2-1). Of the remaining 9, 6 are under 1 entity (City of Tshwane) who failed to respond to numerous e-mails and phone calls (see Appendix 4 for details), and the remaining 3 are in City of Capetown (who also didn't respond, in spite of repeated efforts (Appendix 4). Finally, SRK contacted one of the authors of the Department of Minerals and Energy study for further information (see SRK study, Appendix 3), and his response was that many of the original 57 sites are no longer viable as landfill gas collection sites, since they had been closed for 5+ years (with little/no remaining active gas). This is likely the reason for a lack of response from many of the sites - i.e. the fact that they are closed and have little/no remaining landfill gas to mine. In conclusion, it is incorrect to assume that 3 of 50 (or 57) were considered. The actual figure is 3+4+4=11 (3 venting, 4 under our project, and 4 registered under CDM) of 20.	Ok reviewed and closed
Evidence that DNA of South Africa was informed of the prior consideration for CDM is not provided	CL-9	PP: 28:11:2011 A soft copy of the UN's "Prior Consideration of the CDM Form" (dated 20/11/2009) was provided to the DOE during the site visit. Proof of submission of this document to the HNA DNA submitted to the validating DOE "Joburg LF CDM Prior Consideration to UN HNA DNA 15 12 2009"	Ok reviewed and closed

Please Provide reference to information to the UNFCCC secretariat in writing of commencement of the project activity and of their confirmation from UNFCCC secretariat	CL-10	PP: 03:02:2011 A soft copy of the UN's "Prior Consideration of the CDM Form" (dated 20/11/2009) was provided to the DOE during the site visit. DOE: 28/2/2011 OK	Ok reviewed and closed
Evidence of Lease and gas rights agreement to undertake the project as a proposed CDM project activity is not provided	CL-11	PP 14 04 2011: A soft copy PDF of the truncated document (for confidentiality reasons) titled "Final lease and Gas Rights Agreement Joburg&ENERG" submitted to the DOE with the latest response and project documentation	Ok reviewed and closed

Evidence of ERPA and signed date is not Provided	CL-12	DOE: 28/2/2011 This was not tracked in the previous protocol PP 21 03 2011: Please refer to our response/comment in the previous PDF validation protocol, where we stated that "[t]hough DOE has not officially assigned a CAR/CL # here, this has already been addressed during the site visit, where a copy of the ERPA (with cover and signature pages only) for the project was provided as soft copy to DOE." DOE: 13/04/2011 Agreed, Verifier witnessed the documents from Mr. David Cornish's' computer however we have nothing in form of documentation that would support an opinion. PP 14 04 2011: A soft copy PDF of the truncated document (for confidentiality reasons) titled "ERPA_LP, 10 July 2008" submitted to DOE with the latest response and project documentation.	Ok reviewed and closed
--	-------	---	------------------------

Provide evidences to support the period of expected operation used in the investment analysis.	CAR 18	Answer 1 The agreement between the Project Developer and the Johannesburg Municipality was signed on 27/05/2009, and ends after 20 years, on 27/05/2029. Answer 2 The validating DOE was shown this confidential agreement during the site visit and given a copy of the cover and signature pages. We are resending these, along with a third page showing the 20 year period – the PDF filename is: “3-page Joburg Muni Ener-G agreement 27 05 2009”. The primary hardware is comprised of: - Electrical generators: The LFG generators have an anticipated life of 10-15 years depending on operational conditions, fuel quality (in the form of LFG), and the maintenance regime adopted. Please refer to PDD section A.4.3 p.6. This is further supported by a 3rd party opinion (Golder Associates’ “Technical Due Diligence Report”, p.59), the relevant pages of which are attached with this response; - - Gas collection and Flaring system: The technical lifetime is 20 years. Please refer to p. 8 of “Landfill Gas Capture Design vs. Actual Performance and the Future for CDM Projects”, organised by the World Bank. The relevant pages of this report are attached with this response. Since the IRR calculation reflects the period of expected operation of the project activity, as per EB 62, annex 15, guidance 3, there is no requirement to include fair value at the end of investment period. Per EB 62, annex 15, guidance 3 “[b]oth project IRR and equity IRR calculations shall as a preference reflect the period of expected operation of the underlying project activity (technical lifetime), or if a shorter period is chosen, include the fair value of the project activity assets at the end of the assessment period. In general a minimum period of 10 years and a maximum of 20 years will be appropriate.”	Answer 1 (01/08/2011) The referred document was accepted. But is still not clear: 1: what is the technical lifetime of the equipment? 2: What is the investment fair value at the end of the assessment period. As per EB 62 annex 5 guidance 4: “The fair value of any project activity assets at the end of the assessment period should be included as a cash inflow in the final year. The fair value should be calculated in accordance with local accounting regulations where available, or international best practice. It is expected that such fair value calculations will include both the book value of the asset and the reasonable expectation of the potential profit or loss on the realization of the assets.” Answer 2 By reviewing supplied documentation and comparing with technology applied in the project, specifications and proposed project technology from LPO it is deemed that the stated technical lifetime is reasonable
---	---------------	--	---

The guidelines on the assessment of investment analysis version 4 to determine the benchmark has not been used. Moreover the benchmark is not in accordance with the referred annex in regard to: - equity cost - debt to asset and equity to asset ratios - cost of debt	CAR 19	Version 4 of the "Guidelines on the assessment of investment analysis" was presented at EB61 (date 03/06/2011), while project validation commenced 18/08/2010 (i.e beforehand). Furthermore, as per #15, p. 4 of the "Guidelines on the assessment of investment analysis" , version 04 (EB61), Annex 13, "the cost of equity should be determined either by: (a) selecting the values provided in Appendix A; or by (b) calculating [sic] the cost of equity using best financial practices, based on data sources which can be clearly validated by the DOE", so using the table (i.e. option (a) in Appendix A is optional, and not required, since option (b) has been employed.	Answer 1 (01/08/2011) The answer was accepted because the benchmark has calculated by using best financial practices, based on data sources which can be clearly validated by the DOE. CAR 19 is closed
--	--------	--	---

The input values to determine the amount of energy generated by the project activity is not provided	CAR 20	Refer to spreadsheets: "Joburg LFG to Energy FA_17Aug10_Val Submission v2 03 02 2011" (tab "Power Ener-G"); and "Joburg LF BE CER v4 03 02 2011". Power generation is clearly calculated based on: - The gas model, as calculated using the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site", version 05 (EB 55); - 7,800 working hrs/yr.; and - 84% output of gensets. Ener-G have assumed 7,800 hours operational hours per genset per annum, reflecting 89% availability (i.e. marginally greater than (and consequently more conservative) than the 88% availability value used on other LFG projects by the same project developer, a value approved by a 3rd party technical consultant ("Golder Associates"). Please refer to p.137 of "Technical Due Diligence Report". The relevant pages of this report are attached with this response.	Answer (25/08/2011) All evidences have been checked and all values were validated. CAR 20 is closed
---	---------------	--	--

Provide a spreadsheet containing all the assumptions and input values used in the investment analysis with its respective description and provide the evidences to justify the respective evidence, the description of the evidence and evidence's date. Make sure that all information and evidences are based on the relevant information available at the time of the investment decision and not information available at an earlier or later point. (Total investment, energy price, plant load factor, O&M costs and among others)	CAR 21	The requested information was already compiled and made available to the validating DOE, in tabs "Finance Base", "OPEX Base", "CAPEX Base", and "Power Rates" of the spreadsheet "Joburg LFG to Energy FA_17Aug10_Val Submission v2 03 02 2011". This spreadsheet is being sent to validating DOE again with this response. For CAPEX: - "29 05 2009 purchase order for generators"; - Derating Spec - G3516 Dry Manifold 1136kWe Engine Spec.; For OPEX: - "16 01 2010 Ener-G Systems letter including operating cost experience statement"; For Revenues: - The tariff used is per the Maximum Programme Price of Eskom's 2010-2018 Medium Term Power Purchase Programme ("MTPPP"). After 2018, an inflation corrected electricity price is employed. Please refer to the attached financial calculations. The relevant pages of Eskom's MTPPP are attached with this response.	Answer 1 (01/08/2011) Provide the referred documents in order to check and cross-check the following input values in the investment analysis: - CAPEX - OPEX - Revenue Answer 2 (25/08/2011) All evidences have been checked and all values were validated. CAR 21 is closed
Did the project participants rely on values from Feasibility Study Reports (FSR) that are approved by national authorities for proposed CDM project activities?	CAR 22	The FS used values from respected national and international sources, among them: - Nedbank, one of the largest financial institutions is S. Africa (Indicative termsheets Nedbank (04 & 08/2009)); and ABSA, one of the largest financial institutions is S. Africa (ABSA Indicative termsheet (05/05/2009)).	Answer 1 (01/08/2011) The referred documents were checked and accepted. CAR 22 is closed

Clarify with evidences the moment of investment decision, in order to guarantee that the input values are the correct ones at this moment in the project chronology.	CAR 23	PP 21 03 2011: Please refer to PDD “Table B.5.6: Major Milestones achieved throughout CDM Project”, where DOE can see numerous of milestones that occurred prior to the project starting date. Also, please refer to our response/comment in the previous PDF validation protocol, where we stated that “[t]hough DOE has not officially assigned a CAR/CL # here, this has already been addressed during the site visit, where lease and gas rights documentation for the project (i.e. the 5 individual sites) was provided as soft copy to DOE”. DOE: 13/04/2011 Agreed, Verifier witnessed the documents from Mr. David Cornish’s computer however we have nothing in form of documentation that would support an opinion. PP 14 04 2011: A soft copy PDF of the truncated document (for confidentiality reasons) titled “Final lease and Gas Rights Agreement Joburg&ENERG” will be resent to the DOE with the latest response and project documentation.	Requested documentation is reviewed and accepted hence CAR 23 is closed
--	--------	---	---

Transparent documentation of the approach/technology used to convert the flow on wet basis to dry basis followed is not provided	CL-13	PP: 03:02:2011 The monitoring parameter tables in Section B.7.1 specify use of a normalised flow-meter. Therefore (as per the "Tool to determine project emissions from flaring gases containing methane" (Version 01, adopted at EB 28)), there is no need to monitor the gas temperature and convert from wet to dry, as the meter already accounts for this. DOE: 28/2/2011 Approaches to convert the flow on wet basis to dry basis is not provided PP 21 03 2011: The monitoring parameter tables in PDD section B.7.1 specify the use of thermal mass flow-meter(s) (measuring the flow of gas using the thermal properties of the gas or gas mixture), and are therefore less prone to measurement errors in comparison to flow-meters based on volumetric data (i.e. gas velocity or dynamic pressure). A letter from a reputable flow-meter manufacturer (i.e. "Endress + Hauser") is attached with our response, regarding the accuracy of thermal mass flow-meters. In addition, flow-meters used will measure the flow in normalised cubic meters. Therefore (as per ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities" (Version 11, adopted at EB 47)), there is no need to monitor gas temperature, since the meter already accounts for this. Specifically, ACM0001 states that "[n]o separate monitoring of temperature/pressure is necessary when using flow meters that automatically measure temperature and pressure, expressing LFG volumes in normalized cubic meters" DOE: 13/04/2011 - OK	Ok reviewed and closed
--	-------	--	------------------------

Transparently detail the data processing arrangements for LFG continuously monitoring system	CL-14	PP: 03/02/2011 In Section B.7.1 of the PDD, it is stated that data will be measured continuously with flow-meter(s). DOE: 28/2/2011 It is not clear in PDD monitoring how it is ensured that methane fraction of landfill gas averaged at hour x should be used with LFG flow which is averaged at the same hour x – refer ACM section III PP 21 03 2011: Section B.7.1 of the PDD, (i.e. the methane fraction monitoring table) has been updated to read "Methane content will be measured directly with a continuous gas analyser (i.e. at least hourly) by the Project Proponent. Values to be averaged hourly or at a shorter time interval". DOE: 27/06/2012 An example spread-sheet showing the data and its processing methodology would be advisable including the discrimination of "valid hours" and "no claim hours" (eg flare off or plant operational parameters not complied with such as combustion temp. too high / low). PP: 04/07/2012 Several formulas are entered typically in the CER calculation spreadsheet for reporting monitored data in a CDM landfill project in order to comply with the methodology. 1. A first check formula consists of checking if all the monitored data within the data set at a specific time is above zero. A negative result would disqualify the data set from being considered in the ER calculation. 2. A second formula usually consists of checking if the data set complies with the flare tool condition of having $T_{\text{flare}} > 500^{\circ}\text{C}$. 3. A third formula usually checks compliance of the data set with the manufacturer conditions, i.e. flare maximum and minimum flows, maximum and minimum combustion temperature, etc... EcoSecurities has considerable experience in developing monitoring systems for processing and reporting landfill data in order to comply with CDM rules, as described in the typical steps listed above.	Ok reviewed and closed
--	-------	--	------------------------

Please clarify approach used for methane fraction assumptions considered on basis (wet or dry) It is not clear which approach is used to convert from wet flow to dry flow	CL-15	PP: 03:02:2011 Please refer to footnote related to parameter wCH_{4,y} in equation (9) in Section B.6.1 of the PDD where “wet basis” is specified. DOE: 13/04/2011 OK	Ok reviewed in context and closed
Provide in PDD, the measurement methods for the continuous monitoring of parameter wCH₄	CL-16	PP: 03:02:2011 In Section B.7.1 of the PDD, it is stated under parameter "wCH₄", that data will be measured continuously. DOE: 28/2/2011 How this continuous approach results in a value / time that is in turn applied in ER calculations is not provided in PDD PP 21 03 2011: Section B.7.1 of the PDD, (i.e. the methane fraction monitoring table) has been updated to read "Methane content will be measured directly with a continuous gas analyser (i.e. at least hourly) by the Project Proponent. Values to be averaged hourly or at a shorter time interval". DOE: 13/04/2011 OK	Ok reviewed and closed
Fossil fuel consumption data available from Eskom website not consistent with data used to calculate GEF Formula on page 29 of PDD v7 is not consistent with formula in ACM0001	CL-17	The points raised have been addressed as follows: 1. The formula for project emissions for flaring has been corrected on page 29 as well as page 42 of the PDD. 2. The GEF has been revised to remove inconsistency with Eskom snapshot Besides, the FA and the CER calculator have also been revised accordingly. There is slight change in ERs due to change in GEF from 0.930 to 0.977 tCO₂e/MWh Also, the FA calculator has been revised to match the ERs used for calculating IRR with CDM to be same as that mentioned in the ER calculator. Please find attached the revised documents.	DOE 28/2/2011 Reviewed and Ok

Clarify approach used for methane fraction assumptions considered on basis (wet or dry)	CL-18	PP: 03:02:2011 Please refer to footnote related to parameter $w_{CH_4,y}$ in equation (9) in Section B.6.1 of the PDD where “wet basis” is specified. DOE: 27/06/2012 Both CL 15 and 18 seem to assert that the % methane is measured on a wet basis but the flow meters work on a dry basis (E and H letter 10-9-9). Commonality of reference conditions is necessary for calculations to give accurate results. Wet to dry conversion is formulaic. Note Checklist q 7f(iv) says both % CH₄ and flow measured wet). Typically raw LFG contains 1 to 4% H₂O but highly putrescible landfills can exhibit more water from rapid food decay. PP 04/07/2012 The % methane The % methane measuring devices are fitted with water removal units in order to prevent damage to the sensor head. However, all moisture is never removed so the concept of dry or wet is relative. • It is important to note that the flare tool allows for some degree of humidity in the measurement of the LFG flow, as the formulaic correction on the flow is only required if the LFG is warmer than 60°C. This upper limit is not suggested by the tool for the % methane measurement for 2 reasons: • water is usually partially removed as part of the % methane measurement, and • It is conservative to measure LFG flow on a ‘dry’ basis and methane % on a wetter basis, as this results in less methane stream destroyed being reported and hence lower ERs claimed. Regarding the flow measurement, the thermal flow meters are said to provide flow readings without the moisture content in the gas metered, hence this is what is explained in the E+H letter. However, the reason why the measurement is ‘checked’ as wet is because the measurement is indeed performed on a gaseous stream containing all its moisture, there is no moisture removal as part of the measurement process, it is only the flow reading provided that excludes moisture content in the gaseous stream. Finally, it is not expected to have unusually high water content in LFG as there is no reason to consider that the landfills covered by the project would be more putrescible than the norm.	DOE: 04/07/2012 OK
---	--------------	--	--------------------------------------

Information on the measurement methods for continually monitoring w_{CH_4} is not provided in PDD,	CL-19	PP: 03/02/2011 In Section B.7.1 of the PDD, it is stated under parameter "wCH4", that data will be measured continuously. DOE: 28/2/2011 How this continuous approach results in a value / time that is in turn applied in ER calculations is not provided in PDD PP 21 03 2011: Section B.7.1 of the PDD, (i.e. the methane fraction monitoring table) has been updated to read "Methane content will be measured directly with a continuous gas analyser (i.e. at least hourly) by the Project Proponent. Values to be averaged hourly or at a shorter time interval". DOE 27/6/2012 How do the flow meters measure flow accurately when the methane % varies away from the flow calibration benchmark of 50% CH₄ by volume ? That is to say what adjustments are made to the flow data to correct for varying CH₄% ? See also wet / dry measurement queries below. PP 04/07/2012 Thermal mass flow-meters need adjustment factors to account for metering of different gas composition than that of the standard gas used during calibration. These factors will be provided by the manufacturer when the flow-meters are shipped and will be applied to the monitoring data that will be used for calculating claimed emission reduction at time of periodic verifications. This is done in order to be in line with manufacturer's recommendations.	DOE: 04/07/2012 OK
--	--------------	---	---------------------------------------

The O&M cost value is compared with a report prepared by US EPA which uses data and figures referred to the US market. A more suitable basis for determining and comparing O&M shall be provided	CL-20	Response from PP 06/11/2012 The FA has been reviewed again and has been revised slightly. Earlier, the insurance cost and the overhead costs (variable components) had been calculated based on a fixed 20 units of gensets for all years instead of number of installed gensets in that year. In the revised FA these have been linked with the number of gensets in the given year. This is a conservative and more appropriate approach and reduces the O&M costs in first year to 373 ZAR/MWh (refer revised FA sheet). The sensitivity analysis has also been revised in line with the aforesaid. The following independent, third party evidences support the O&M costs used in the project activity: Ener-G Systems had raised a query to DSW, a cleansing and solid waste company currently managing the maintenance and operations of Durban landfill gas to electricity project, eThekweni municipality, South Africa. The response from DSW clearly mentions that the average O&M costs for operations, maintenance and overheads for the year July 11- June 12 is 364.81 ZAR/MWh for the Durban landfill site. This is within very close range to the average O&M costs for the project activity for year 2012, i.e. 373 ZAR/MWh. Thus, it is substantiated that the O&M costs for the project are similar to other landfill gas to electricity projects in the region. The O&M costs in the Joburg Financial analysis are categorized under fixed and variable O&M costs. The fixed costs are site specific in nature and resemble O&M costs for a landfill gas capture site without electricity generation component. The annual average fixed O&M costs for the Joburg project is 900,000 ZAR. This is comparable with Ener-G Systems contract with Enviroserv (ZAR 865,000 in 2008) to provide similar services for Chloorkop landfill gas management site in South Africa without electricity generation component. With the sensitivity over O&M costs around 21%, and the fact that Enviroserv would have entered into a contract with Ener-G Systems only if the prices were competitive, this is deemed appropriate. Further, to this, as a conservative measure, if the variable O&M costs (from other costs and site personnel) are made 0 for the entire lifetime of the project, the IRR still does not cross the benchmark and remains at 11.61%	DOE 7/11/2012 Reviewed submitted documents and comparison and accepted BVC received and analysed revised documents; 1. Revised FA (Ref Cat1-/5/) 2. Revised PDD in track-change mode (Ref Cat1-/4/) 3. DSW letter (confirming O&M cost for Durban Landfill) (Ref Cat2-/64/) 4. Golder Associates Report (refer highlighted sections for quick reference) (Ref Cat2-/66/) 5. Enviroserv Contract with Ener-G (for fixed O&M cost comparison) (Ref Cat2-/65/)
---	--------------	--	---

		Ener-G Systems had approached Nedbank Capital (a group company of Nedbank, one of the largest banks in South Africa) for financing the landfill projects at various sites in South Africa. Nedbank had appointed Golder Associates Africa (Pty) Ltd as a Technical Advisor (LTA) to conduct a due diligence of the proposed projects which included Joburg Landfill sites. Golder Associates is a large global company providing consulting, design, and construction services across the globe. Its more than 8,000 employees operate from more than 180 offices in Africa, Asia, Australasia, Europe, North America and South America providing services in manufacturing, mining, oil and gas, power, urban development and infrastructure sectors. As part of Phase 1, the pre-financial closure due diligence, Nedbank had requested a technical due diligence report from Golder to confirm the viability of the project, the expected revenue to be generated and the correctness of the timetable. Golder Associates had specifically reviewed the financial assessment of the project and had given independent opinion on the same. As part of their independent study Golder reviewed the project costs (OPEX) and confirmed the total OPEX costs for gensets, directly associated infrastructure and labour to be in accordance with industry norms for Joburg landfill project. Thus, the O&M costs in the project activity are deemed appropriate as per the industry norms and similar to other projects in the region.	
--	--	--	--

A transparent analysis for landfill common practice shall be provided on PDD	CL-21	Response from PP 06/11/2012 The PDD has been revised to include the status of all 20 landfill sites comparable to the project activity. Please refer the revised PDD.	DOE 7/11/2012 Reviewed data and crosschecked and accepted PP has provided a clearer verifiable source of data to determine whether proposed project is common practice, VIZ; 1) "Capacity Building in Energy Efficiency and Renewable Energy: Landfill Gas Resources for Power Generation in South Africa, Department of Minerals and Energy Pretoria" 2) LFG extraction implementation for the similar landfill sites in South Africa. Projects that have submitted a Project Idea Note to South Africa DNA, verifiable from http://www.energy.gov.za/ 3)The two references above supplement Department of Water Affairs and Forestry, 1998: Minimum requirements for waste disposal by landfill, chapter 8.4.6 Gas Management Systems, document available at: http://www.dwaf.gov.za/Dir_WQM/docs/Pol_Landfill.PDF
--	--------------	--	--