




# Verification and certification report form for CDM project activities

(Version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the verification and certification report form for CDM project activities" at the end of this form.

## VERIFICATION AND CERTIFICATION REPORT

<b>Title of the project activity</b>	Durban Landfill-gas-to-electricity project – Mariannhill and La Mercy Landfills
<b>Reference number of the project activity</b>	UNFCCC ID: 0545 TN P-No. : 8000467074 – 16/163
<b>Version number of the verification and certification report</b>	1.0
<b>Completion date of the verification and certification report</b>	13/04/2017
<b>Monitoring period number and duration of this monitoring period</b>	MP 7 (MP 02 of 2nd CP) 01/10/2014 – 30/09/2016 (both days included)
<b>Version number of monitoring report to which this report applies</b>	2
<b>Crediting period of the project activity corresponding to this monitoring period</b>	15/12/2013 to 14/12/2020 (including both days)
<b>Project participant(s)</b>	Durban Solid Waste (DSW) – eThekweni municipality Netherlands' Ministry of Infrastructure and the Environment (IenM); Electrabel S.A.; Netherlands' Ministry of Economic Affairs, Agriculture and Innovation (EL&I); Government of Finland – Ministry of Foreign Affairs of Finland; Fortum Corporation; RWE Power AG; Chubu Electric Power Co. Inc; The Chugoku Electric Power Co. Inc; Kyushu Electric Power Co. Inc.; Mitsubishi Corporation; Tohoku Electric Power Co. Inc.; The Tokyo Electric Power Co. Inc.; Shikoku Electric Power Co. Inc; Japan International Cooperation Agency (JICA); Mitsui & Co. Ltd.; Government of Norway – Ministry of Foreign Affairs; Norsk Hydro ASA; Statoil ASA; Deutsche Bank AG; BP Alternative Energy International Ltd;

	GDF SUEZ; Government of Sweden - Swedish Energy Agency; International Bank for Reconstruction and Development (IBRD) as Trustee of the Prototype Carbon Fund (PCF)
<b>Host Party</b>	South Africa
<b>Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)</b>	Scope: 13 / Technical Area: 13.1 CDM Methodology: ACM0001 ver 15: "Large-scale Consolidated Methodology: Flaring or use of landfill gas" Standardized Baseline: ASB0001 ver. 01.0: "Standardized baseline: Grid Emission Factor for the Southern African power pool"
<b>Estimated GHG emission reductions or net anthropogenic GHG removals for this monitoring period in the registered PDD</b>	129,256 tCO <sub>2e</sub> * <i>*The PDD value has been calculated prorata the yearly values by the number of days to this monitored</i>
<b>Certified GHG emission reductions or net anthropogenic GHG removals for this monitoring period</b>	72,465 tCO <sub>2e</sub>
<b>Name of DOE</b>	TÜV NORD CERT GmbH
<b>Name, position and signature of the approver of the verification and certification report</b>	 Martin Saalmann Final Approver

**SECTION A. Executive summary**

The International Bank for Reconstruction and Development (IBRD), as Trustee of the Prototype Carbon Fund (PCF) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 7th periodic verification of the project:

“Durban Landfill-gas-to-electricity project – Mariannhill and La Mercy Landfills”

with regard to the relevant requirements for CDM project activities.

This verification covers the period from 01/10/2014 to 30/09/2016 (including both days).

The project reduces GHG emissions due to collection and destruction in gas engine for power generation of landfill gas from the operational Mariannhill landfill in the city of Durban in South Africa. The landfill is now receiving approximately 1000-1200 tonnes of waste per day. The PP has and is constructing gas collection system including vertical and horizontal wells. The landfill gas (LFG) used to generate electricity in a 1 MW gas engine generator set by Jenbacher. Further landfill gas is destroyed as to be burnt in an enclosed flare. The electricity generated is fed into the national grid of South Africa. By this the project activity reduces greenhouse gases in destroying the methane contained in the landfill gas as well as in replacing electricity in the connected grid which is mainly generated using fossil fuels.

Further the previously included landfill gas project at La Mercy landfill has been decommissioned and is no further in use.

Details of the project location are given in table A-1 below:

**Table A-1:** Project Location

No.	Project Location
Host Country	South Africa
Region:	KwaZulu Natal Province
Project location address:	Municipality of eThekweni
Latitude:	-29.846389
Longitude:	30.837778

Basic technical details of the project are summarized in table A-2.

**Table - A-2:** Technical data of the project activity

Parameter	Unit	Value
Electricity generator (Jenbacher type 320)	MW	1.0
Number of Electricity generator (Jenbacher type 320)	-	1
Vertical extraction wells	-	11
Horizontal gas collection wells (total number of wells including shut down wells)	-	26
Horizontal gas collection wells closed (due to e.g. bad LFG quality, low LFG amount, filling management, etc.)	-	4
Flare	Nm <sup>3</sup> /h	1,000

Parameter	Unit	Value
Number of flares		1

With the ongoing filling of the landfill with waste 9 new wells number HW18 to HW26 have been constructed. Besides several (4) wells HW8, HW9, HW 12, HW13 have been closed during this monitoring period either temporarily or for longer period due to bad LFG quality, low LFG amount, filling management or other reasons.

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document.
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., ACM001 ver. 15 and the Standardized Baseline ASB0001 ver 1 for the related grid emission factor.
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 7th periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **72,465 tCO<sub>2</sub>e**

## SECTION B. Verification team, technical reviewer and approver

### B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader / Technical Expert	IR	Winter	Stefan	TN Cert GmbH	x	x	x	x
2.	Verifier	El	Kochaniewicz	Gregor	-	x	-	-	-

### B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Observer reviewer	ER	Lubanga	David	-
2.	Technical reviewer /Approver	IR	Saalmann	Martin	TÜV NORD CERT

## SECTION C. Application of materiality

### C.1. Consideration of materiality in planning the verification

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

#### Materiality Threshold

The verification is based on the materiality threshold identified in table C-1 below:

**Table C-1:** Applied Materiality Threshold

	Threshold	Related to
<input type="checkbox"/>	0.5 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal equal to or more than 500,000 tonnes of carbon dioxide equivalent per year <sup>1</sup> ;
<input type="checkbox"/>	1 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal of between 300,000 and 500,000 tonnes of carbon dioxide equivalent per year;
<input checked="" type="checkbox"/>	2 %	Emission reductions or removals for registered large-scale CDM project activities achieving a total emission reduction or removal of 300,000 tonnes of carbon dioxide equivalent per year or less;
<input type="checkbox"/>	5 %	Emission reductions or removals for registered small-scale CDM project activities other than registered CDM project activities covered under next category below;
<input type="checkbox"/>	10 %	Emission reductions or removals for the type of registered CDM project activities referred to in decision 3/CMP.6, paragraph 38 (referred to as microscale project activities).

#### Strategic Analysis

At the beginning of the verification the verification team leader has assessed the nature, scale and complexity of the verification tasks by carrying out a strategic analysis of all activities relevant to the project activity. The team leader has collected and reviewed the information relevant to assess that the designated verification team is sufficiently competent to carry out the verification and to ensure that it is able to conduct the necessary risk analysis.

#### Risk analysis and detailed audit testing planning

For the identification and assessment of potential reporting risks and to determine the necessary detailed audit testing procedures for residual risk areas the following table is used.

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Raw data generation	Medium	<ul style="list-style-type: none"> <li>- Missing data due to failure of measurement equipment</li> <li>- Installation of measuring equipment</li> </ul>	<ul style="list-style-type: none"> <li>- Site – visit</li> <li>- Check of equipment</li> <li>- Check of technical data sheets</li> <li>- Check of suppliers</li> </ul>

<sup>1</sup> A year refers to a period of 12 consecutive months.

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
			<ul style="list-style-type: none"> <li>- Dysfunction of installed equipment</li> <li>- Lack of training of operational personnel</li> <li>- Downtimes of equipment</li> <li>- Exchange of equipment</li> <li>- Insufficient accuracy</li> <li>- Change of technology</li> <li>- Accuracy of values supplied by Third Parties</li> </ul>	<i>information / guarantees</i> <ul style="list-style-type: none"> <li>- Check of calibration records</li> <li>- Check of maintenance records</li> <li>- Counter-check of raw data</li> <li>- Check of CDM management system</li> <li>- Check of CDM related procedures</li> <li>- Application of CDM management system procedures</li> <li>- Check of trainings</li> <li>- Check of responsibilities</li> <li>- Check of QA/QC documentation / evidences of involved third parties</li> </ul>
2.	<i>Raw data collection and data aggregation</i>	<i>Medium</i>	<ul style="list-style-type: none"> <li>- Wrong data transfer from raw data to daily and monthly aggregated reporting forms</li> <li>- IT Systems</li> <li>- Spread sheet programming</li> <li>- Manual data transmission</li> <li>- Data protection</li> <li>- Responsibilities</li> </ul>	<ul style="list-style-type: none"> <li>- Check of data aggregation steps</li> <li>- Counter-calculation</li> <li>- Data integrity checks by means of graphical data analysis and calculation of specific performance figures</li> <li>- Check of management system certification (if applicable)</li> <li>- Check of data archiving system</li> <li>- Check of application of Management system procedures</li> </ul>
3.	<i>Missing data due to failure of measurement equipment</i>	<i>Low</i>	<ul style="list-style-type: none"> <li>- The monitoring plan defines emergency procedures in case a meter fails. Besides back-up meters are either installed or available onsite for fast exchange.</li> </ul>	<i>Check if related meters are installed as per monitoring plan. Check if emergency procedure is known across related personnel via interviews. Check back-up meters on correct calibration.</i>
4.	<i>Intentional or unintentional omissions and misstatements in data transfer from invoices (i.e. electricity invoices) or hand written notes (i.e. quantity of waste disposed in landfill for check purposes) into digital Excel ER spreadsheet</i>	<i>Medium</i>	<ul style="list-style-type: none"> <li>- Ineffective quality control of data transfer due to unclear QA/QC procedure</li> </ul>	<ul style="list-style-type: none"> <li>- Counter check with evidences provided</li> </ul>
5.	<i>Monitoring reporting</i>	<i>Medium</i>	<ul style="list-style-type: none"> <li>- Data transfer to the</li> </ul>	<ul style="list-style-type: none"> <li>- Counter check with</li> </ul>

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
			<i>author of the monitoring report</i> - Data transfer to the monitoring report - Unintended use of outdated versions	<i>evidences provided</i> - Audit of procedure application
6.	<i>Calculation Methods</i>	<i>Medium</i>	- Applied formulae - Miscalculation - Mistakes in spread-sheet calculation	- Countercheck on the basis of own calculation. - Spread sheet walk-trough - Plausibility checks - Check of plots
7.	<i>Other calculation parameters</i>	<i>Low</i>	- The values and data sources applied are defined in the PDD and monitoring plan - Supporting documentation version updates	- Update-check of regulatory framework - Countercheck of the applied MP in the MR against the methodology and the PDD

On the basis of the risk analysis the verification has been planned. A detailed audit/verification plan has been prepared and submitted to the project participant(s) in due time before the site visit.

## C.2. Consideration of materiality in conducting the verification

Based on the verification planning the verification has been carried out. The concept of materiality has been considered. A breakdown of the chosen approaches is included in the following table.

<i>Parameter</i>	<i>Approach<sup>+</sup></i>	<i>Errors* detected</i>	<i>Findings reference</i>	<i>Corrected</i>	<i>Remaining verification risk</i>
$V_{LFG, total, y, db}$	CDC	<input checked="" type="checkbox"/>	CL 02	<input checked="" type="checkbox"/>	Not material
$V_{LFG, sent\_flare, y, db}$		<input checked="" type="checkbox"/>	CL 01 CL 02 CAR 03	<input checked="" type="checkbox"/>	Not material
$V_{LFG, EL, y, db}$		<input checked="" type="checkbox"/>	CL 01 CL 02 CAR 03	<input checked="" type="checkbox"/>	Not material
$T_t$		<input checked="" type="checkbox"/>	CL 01 CAR 03	<input checked="" type="checkbox"/>	Not material
$P_t$		<input checked="" type="checkbox"/>	CAR 03	<input checked="" type="checkbox"/>	Not material
$P_{H20, t, Sat}$		<input type="checkbox"/>	-	<input type="checkbox"/>	-
$V_{CH4, t, db}$		<input checked="" type="checkbox"/>	CAR 03	<input checked="" type="checkbox"/>	Not material
$EG_{PJ, y}$		<input type="checkbox"/>	-	<input type="checkbox"/>	-
$C_{PJ, y}$		<input checked="" type="checkbox"/>	CAR 03	<input checked="" type="checkbox"/>	Not material
$Op_{engine, h}$		<input type="checkbox"/>	-	<input type="checkbox"/>	-
$Op_{flare, h}$		<input type="checkbox"/>	-	<input type="checkbox"/>	-
$Flame_m$		<input type="checkbox"/>	-	<input type="checkbox"/>	-
$T_{EG, m}$		<input type="checkbox"/>	-	<input type="checkbox"/>	-
$DL_y$		<input checked="" type="checkbox"/>	CAR 04	<input checked="" type="checkbox"/>	Not material
Management of SWDS		<input type="checkbox"/>	-	<input type="checkbox"/>	-

Aggregate					Materiality threshold not exceeded
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\*) incl. omissions and misstatements

+) Verification Approaches:

CDC:	Complete data check of data including all data aggregation steps
NDC:	Non-complete data check – omissions not material
SPL:	Sampling approach (all data available)
ASP:	Acceptance Sampling
COM:	Data check at higher data aggregation levels and sampling at original data levels

The verification was basically carried out as per the verification plan. However, based on the actual situation on-site and the errors, omissions and misstatements identified during the verification minor deviations from the original plan occurred. However, due to the insignificance no major revision of the overall plan was required. Esp. there was no need for significant modification of the data assessment approaches or for additional / less locations to be visited during the on-site.

## SECTION D. Means of verification

### D.1. Desk review

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- the last revision of the PDD including the monitoring plan<sup>/PDD/</sup>,
- the last revision of the validation report<sup>/VAL/</sup>,
- documentation of previous verifications<sup>/VER/</sup>
- the monitoring report, including the claimed emission reductions for the project<sup>/MR/</sup>,
- the emission reduction calculation spreadsheet<sup>/XLS/</sup>.

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

### D.2. On-site inspection

Duration of on-site inspection: 31/01/2017 to 01/02/2017				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening meeting: Round of introduction, attendance register, final confirmation of the audit plan	PP office	31/01/2017	Stefan Winter (SW)
2.	General introduction of the project activity, current status, changes, etc.	PP office	31/01/2017	
3.	Site visit to Mariannhill landfill site: - Verify facilities and equipment (LFG collection and transport system, LFG pre-treatment, elec. Generation unit, elec. Meters, CH4 monitoring, T- and P-meters, DCS) - Data collection and aggregation - Interview with data coordinators, process engineers and other key personnel at site	Mariannhill landfill	31/01/2017	
4.	Document check:	PP office	31/01/2017	



Duration of on-site inspection: 31/01/2017 to 01/02/2017				
No.	Activity performed on-site	Site location	Date	Team member
	<ul style="list-style-type: none"> <li>- Check QMS records, maintenance records, instrument specifications, monitoring diagram, calibration records, training and qualification records</li> <li>- Check of operation logs and the data collecting/archiving /calculation process</li> <li>- Any further documents relevant to be checked</li> </ul>		- 01/02/2017	
5.	Review of emission reductions calculation	PP office		
6.	Closing meeting: Summary of the audit Presentation of identified issues	PP office	01/02/2017	

### D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Wright	Marc	D.S.W./ Project Engineer	31/01/2017 - 01/02/2017	All issues	SW
2.	Winn	Richard	Enviro /Environmental Assets Management		General PA issues	
3.	Couth	Bob	SLR Consulting Ltd. / CDM Coordinator		All issues	
4.	Sewchurran	Sanjeeth	eThekweni Municipality/ Electrical Engineer		Electricity dept. / Invoicing	
5.	Sobey	Cedric	Renew / Observer		Operation, downtimes, gas quality, etc.	
6.	Sobey	David	Renew / Gas Extraction & CDM		All issues	
7.	Pass	Jon	Wilson & Pass Inc./Technical and admin advice to D.S.W.		CDM Flaring	
8.	Pillay	L.	Envitech		CDM Flaring	
9.	Singh	V.	Envitech		Air Quality Monitoring	
10.	Antoni-Naidoo	A.	SGS	31/01/2017	Observer	
11.	Naidoo	N.	EWS	31/01/2017	Observer	
12.	Dhekwi	D.	EWS	31/01/2017	Observer	

### D.4. Sampling approach

#### D.4.1 Sampling during monitoring

<input checked="" type="checkbox"/>	No sampling approach has been used by the PP to determine the monitored parameters
<input type="checkbox"/>	A sampling approach has been taken for the following monitored parameter(s):

Parameter	Sampling approach <sup>1)</sup>	Sampling Type <sup>2)</sup>	Population	Sample Size
<i>n.a.</i>				

<sup>1)</sup> Sampling Approaches:

SiRS: Simple Random Sampling  
 StRS: Stratified Random Sampling  
 SS: Systematic Sampling  
 CS: Cluster Sampling  
 MSS: Multi-stage Sampling

<sup>2)</sup> Sampling Types:

PS: Parameter Sampling

## D.4.2 Sampling approaches during verification

<input checked="" type="checkbox"/>	No sampling approach has been used by the VT to verify the monitored parameters
<input type="checkbox"/>	A sampling approach has been applied by the VT for the following monitored parameter(s):

Parameter	Sampling approach <sup>1)</sup>	Sampling Type <sup>2)</sup>	Population	Sample Size
<i>n.a.</i>				

<sup>1)</sup> Sampling Approaches:

SiRS: Simple Random Sampling  
 StRS: Stratified Random Sampling  
 SS: Systematic Sampling  
 CS: Cluster Sampling  
 MSS: Multi-stage Sampling

<sup>2)</sup> Sampling Types:

AS: Acceptance Sampling  
 PS: Parameter Sampling  
 COM: Full data check at higher data aggregation levels and sampling at original data levels

## D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form (E.1)	-	-	-
Compliance of the project implementation with the registered PDD (E.3)	-	-	-
Post-registration changes (E.4)	-	1	-
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline (E.5)	-	-	-
Compliance of monitoring activities with the registered monitoring plan (E.6)	-	2	-
Compliance with the calibration frequency requirements for measuring instruments (E.7)	2	-	-

Assessment of data and calculation of emission reductions or net removals (E.8)	-	1	-
Others (please specify)	-	1	-
<b>Total</b>	<b>2</b>	<b>5</b>	<b>0</b>

## SECTION E. Verification findings

### E.1. Compliance of the monitoring report with the monitoring report form

<b>Means of verification</b>	<p>A draft monitoring report was submitted to the verification team by the project participants. The DOE has made this report publicly available prior to the start of the verification activities. No comments were received.</p> <p>By means of the UNFCCC website it has been checked whether the latest applicable MR template CDM-MR-FORM has been used.</p> <p>Further it has been checked whether the latest instructions for filling out the MR template have been followed. Every section has been checked against the respective guidance.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /MRT/</li> <li>• /unfccc/</li> </ul>		
<b>Findings</b>	<input checked="" type="checkbox"/>	The latest reporting template CDM-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.	
	<input checked="" type="checkbox"/>	The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.	
	<input checked="" type="checkbox"/>	<p>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</p> <p>CAR 02: During onsite inspection it has been identified that the downtime data is not full consistent with the data checked in the DCS at project location. Clarification and revision is requested.</p> <p>CAR 03: MR states that a PRC #PRC-545-0002 has been submitted without prior approval. This is inconsistent to data found on related UNFCCC project webpage. As per related PRC assessment report the PRC has been prior approved before Rflss of previous monitoring period. Clarification and revision is requested.</p>	
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.	
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.	
		The PP has provided a monitoring report for the related monitoring period to be verified. After correction of raised issues during verification assessment the final MR is based on latest template available and filled according to the instructions to fill the form.	

### E.2. Remaining forward action requests from validation and/or previous verification

During the validation the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose FARs might have been raised. Likewise FARs might have been raised in the course of previous verifications.

In the course of this verification the latest version of the PDD <sup>/PDD/</sup> and the previous verification report <sup>/VER/</sup>, where applicable, have been checked in order to identify any remaining forward action requests. For the current monitoring period the following applies:

(i) Open issues from validation:

<input checked="" type="checkbox"/>	There were no open issues which have been addressed in the latest version of the validation report.
<input type="checkbox"/>	All open issues from the validation have been appropriately addressed in the context of previous verifications.
<input type="checkbox"/>	All issues related to the validation have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the validation have <b>not</b> yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

(ii) Open issues from previous verifications:

<input type="checkbox"/>	N/A – as this is the first monitoring period for this CDM project activity.
<input type="checkbox"/>	There were no open issues which have been addressed in the previous verification report
<input checked="" type="checkbox"/>	All issues related to the previous verification have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the previous verification have <b>not</b> yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

### E.3. Compliance of the project implementation with the registered project design document

<b>Means of verification</b>	<p>By means of an in-depth review of the PDD in its latest form – as downloaded from the UNFCCC project site - and the checks carried out during the on-site visit an assessment has been carried out whether the project has been implemented and operated in line with the latest approved version of the PDD and whether all physical features of the project are in place. The following has been checked: implemented technology, project equipment as well as monitoring and metering equipment.</p> <p>Further it has been checked if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period and consistent notations of key equipment (meters etc.) in PDD, MR and calculation spreadsheet are applied.</p> <p>Interviews with operational personnel have been carried out, QMS records, maintenance records, instrument specifications were checked in this context.</p> <p>Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred.</p> <p>Further it has been checked whether any observed deviations from the registered project design have been correctly addressed as PRCs.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /PDD/</li> <li>• /MR/</li> <li>• /VVS/</li> <li>• /XLS/</li> <li>• /VER/</li> </ul>
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		<ul style="list-style-type: none"> <li>• /LPL/</li> <li>• /CAUD/</li> <li>• /TS/</li> <li>• /unfccc/</li> </ul>
<b>Findings</b>	<input checked="" type="checkbox"/>	The project has been implemented as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.
	<input type="checkbox"/>	The following deviations from the registered / approved project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): - N/A
	<input type="checkbox"/>	In this context the following findings have been raised:
		<i>In case of phased implementation:</i>
	<input checked="" type="checkbox"/>	N/A
	<input type="checkbox"/>	The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.
	<input type="checkbox"/>	The description in section 3.1 of the MR differs in content or the level of detail from the latest version of the PDD. However, the description in the MR is correct and reflects the situation during the site inspection.
	<input type="checkbox"/>	The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows:
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<p>At the project site vertical and horizontal wells are constructed to extract landfill gas from the Mariannhill landfill which is still in operation. The PP has also installed a landfill gas extraction system consisting of a blower, gas cleaning system as well as methane destruction equipment such as a flare of up to 1000 m³/h and a Jenbacher gas engine of 1 MW. The gas engine is connected with a generator and via a transformer generated electricity is fed into the connected grid. The 6 baseline wells are still existent but no landfill gas is produced from those wells. It is intended to physically disconnect the baseline wells.</p> <p>Besides no changes in the mode of operation occurred. However the PP intends to physically shut down the gas connection to and from the baseline wells as those do not produce any LFG anymore and would like to use the related flow meter as spare part. DOE has checked the flow meter and can confirm the flow was zero when checked. Correspondingly a FAR B4 was raised to check whether the baseline collecting system has been physically cut off during next verification.</p> <p>Finally the related FAR from previous verification</p> <p>"The PP intends to physically shut down the gas connection to and from the baseline wells as those do not produce any LFG anymore and would like to use the related flow meter as spare part. During next verification it is to be checked whether the baseline collecting system has been physically cut off." has been properly addressed. As per call with employee and interview with PP the baseline collecting system cell has been physically cut-off. For substantiation pictures have been forwarded when the pipeline has been cut off. Therefore the issue has been closed.</p>	

**E.4. Post-registration changes**

- ☒ By means of site visit, document check and interview it could be verified that the project is implemented and operated in line with the registered PDD and the applied methodology.
- ☐ Post registration changes have been identified and are assessed in detail in the subsequent steps E.4.1 to E.4.7.

**E.4.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline**

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been submitted to the UNFCCC prior to the current monitoring period.		
<input type="checkbox"/>	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.: )
		Appr.date	
		Ref. No.	
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.: )
		Appr.date	
		Ref.No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		
	1	Issue:	
	2	Issue:	
<input type="checkbox"/>	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

**E.4.2. Corrections**

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this or previous monitoring period or submitted with this monitoring report. The result is summarized in the table below.

	During the verification of the current MP no need for corrections has been identified.
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The following corrections have been applied:		
1	Issue:	Previously several monitoring parameters were corrected in accordance with ACM0001 version 15 and relevant tools. The flow diagram and information for parties' involvement was corrected among other editorial changes. The corrections were submitted together with the request for permanent changes from the registered monitoring plan.
2	Issue:	
3	Issue:	
The PDD has been revised accordingly: (New) version No.: 4 Revision date: 30/06/2015		
It is confirmed that the updated / corrected information is an accurate reflection of the actual project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.		
<input checked="" type="checkbox"/> A related post registration change has been submitted prior to the issuance request. The approval has been received on 12/10/2015 via approval number PRC-0545-002. <input type="checkbox"/> A related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		

#### E.4.3. Changes to the start date of the crediting period

<input checked="" type="checkbox"/>	N/A - as this is not the first verification within the crediting period
<input type="checkbox"/>	The PPs do not intend to change the start date of the crediting period.
<input type="checkbox"/>	As the change in the start date was below the related time period as indicated in PS § 277 and § 278 no prior approval was required but only a notification. This notification has been submitted by the PP without involvement of the DOE. The change and new start date has been checked from the related UNFCCC project webpage.
<input type="checkbox"/>	The PPs intend to change the start date of the crediting period. As the intended change in start date beyond the related time period as indicated in PS § 279 prior approval by the Board is required. For detailed assessment of the change please refer to related PRC validation report. As per assessment in this report the DOE confirms that the change to the start date of the crediting period are in line with the related requirements of the VVS and PS.
<input type="checkbox"/>	The approval to change the start date of the crediting period has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z

#### E.4.4. Inclusion of a monitoring plan to a registered project activity

<input checked="" type="checkbox"/>	N/A - as this monitoring plan was part of the registered PDD
<input type="checkbox"/>	In line with PS § 281 or § 282 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 282 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC..

<input type="checkbox"/>	In line with § 282 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.
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#### E.4.5. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input type="checkbox"/>	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period			
<input checked="" type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC			
1	Title	<p>The monitoring plan has been updated w.r.t. the following points and issues:</p> <ol style="list-style-type: none"> <li>Flow diagram has been updated to include the measurement points in PDD w.r.t. actual conditions found onsite</li> <li>Removal of three parameters for monitoring of LFG volume on wet basis as the LFG is monitored on dry basis. (<math>V_{LFGsent\_flare,y,wb}</math>, <math>V_{LFGtotal,y,wb}</math> and <math>V_{LFGEL,y,wb}</math>)</li> <li>Revision of QA/QC and additional comment for parameter w.r.t volumetric flow of LFG</li> <li>The reg PDD is updated w.r.t. the parameter as per tool "Project emissions from flaring" ver 2 SPEC<sub>flare</sub> in section B.6.2. The tool states that the flare specifications have to be documented in the CDM-PDD.</li> <li>The monitoring plan as per reg PDD B.7.1 is updated w.r.t. the parameter <math>p_{H2O,t,Sat}</math> as indicated in related tool for gaseous stream.</li> <li>Parameter T<sub>t</sub>: The QA/QC procedure is updated to be consistent with the "tool to determine the mass flow of a greenhouse gas in a gaseous stream". Besides the source of data is updated in line onsite observation. Finally the monitoring frequency is also corrected.</li> <li>Parameter P<sub>t</sub>: The QA/QC procedure is updated to be consistent with the "tool to determine the mass flow of a greenhouse gas in a gaseous stream". Finally the monitoring frequency is also corrected.</li> <li>Parameter EG<sub>PJ,y</sub>: The measurement procedure is updated to be consistent with the related methodology. Further the determination of net elec. is further specified in line with the onsite observation where the elec. import is deducted from the export generated by the gas engine via bi-directional meter.</li> <li>Parameter Op<sub>flare,h</sub>: As per onsite only a flame detection is used for determination of the flare operation however two criteria are mentioned in PDD.</li> <li>Ex-ante fixed parameter OX has been deleted as already parameter OX<sub>top_layer</sub> in line with methodology ACM0001 is given.</li> </ol>		
	Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved		
	Appr.date	12/10/2015		
	Ref. No.	PRC-0545-002		
	2	Title		
	Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved		
	Appr.date			



	Ref.No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA	
<input type="checkbox"/>	An approval of the following PCfrMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.	
	1	Issue:
	2	Issue:
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:	
	1	Issue:
	2	Issue:

The above stated changes to the monitoring period have been identified during this monitoring period but have been already approved. The final monitoring report and the project activity are now in line with the latest approved monitoring plan.

#### E.4.6. Changes to the project design of a registered project activity

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input type="checkbox"/>	No CoPD has been submitted to the UNFCCC prior to the current monitoring period	
<input checked="" type="checkbox"/>	The following CoPD have been approved or are under approval by the UNFCCC	
	1	Title
		Decommissioning of La Mercy LFG project activity
		Status
		<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved
		Appr.date
		25/11/2011
		Ref. No.
		No ref. number as it was a notification of changes during first crediting period
	2	Title
		Status
		<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date
		Ref.No.
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA	
<input type="checkbox"/>	An approval of the following CoPD.is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.	
	1	Issue:
	2	Issue:
<input type="checkbox"/>	The following CoPD for which appendix 1 of the PS is applicable have been applied:	
	1	Issue:
	2	Issue:

**E.4.7. Types of changes specific to afforestation and reforestation project activities**

<input checked="" type="checkbox"/>	N/A - as this is not an afforestation and reforestation project
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**E.5. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline**

<b>Means of verification</b>	By means of comparison of the MR with (i) the applied CDM methodology (ii) all applicable CDM Meth tools and (iii) if applicable, a standardized baseline the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology/tools/SB. The following sources of information have been used in this context: <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /ACM1/</li> <li>• /TA/</li> <li>• /unfccc/</li> </ul>			
<b>Findings</b>	<input checked="" type="checkbox"/>	The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)		
	<input checked="" type="checkbox"/>	The breakdown of MP accordance of the referenced tools is as follows:		
		1	Title (of the tool)	Tool to calculate project or leakage CO <sub>2</sub> emissions from fossil fuel combustion
			Version	2
			MP compliance	<input type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input checked="" type="checkbox"/> N/A (for MP)
		2	Title (of the tool)	Tool to calculate baseline, project and/or leakage emissions from electricity consumption
			Version	1
			MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
		3	Title (of the tool)	Combined tool to identify the baseline scenario and demonstrate additionality
			Version	2.1
			MP compliance	<input type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input checked="" type="checkbox"/> N/A (for MP)
		4	Title (of the tool)	Emissions from solid waste disposal sites
			Version	6.0.1
			MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
	5	Title (of the tool)	Project emissions from flaring	
		Version	2.0.0	

		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)	
	6	Title (of the tool)	Tool to determine the mass flow of a greenhouse gas in a gaseous stream	
		Version	2.0.0	
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)	
	<input checked="" type="checkbox"/>	The breakdown of MP accordance of the applicable SB is as follows:		
		1	Title (of the SB)	<i>Standardized baseline: Grid Emission Factor for the Southern African power pool</i>
			Version	ASB0001 ver. 01.0
			MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:		
	<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	
<input type="checkbox"/>		The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
The MP is completely in compliance with the last registered/approved version of the PDD / MP or standardized baseline or methodology.				

## E.6. Compliance of monitoring activities with the registered monitoring plan

### E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

<b>Means of verification</b>	<p>By means of comparison of the MR and the ER calculation with the latest version of the registered PDD the verification team has checked whether all parameters fixed ex-ante or at renewal of the crediting period have been applied correctly.</p> <p>Further it has been checked whether the GWP for the respective period have been correctly applied.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /XLS/</li> <li>• /PDD/</li> <li>• /PS/</li> <li>• /VVS/</li> <li>• /unfccc/</li> <li>• /TOOL/</li> <li>• /ACM1/</li> </ul>	
<b>Findings</b>	<input checked="" type="checkbox"/>	The MR and the ER calculation have considered the parameters fixed ex-ante or at the renewal of the crediting period correctly, no deviations have been observed.
	<input type="checkbox"/>	<p>The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification:</p> <p>- N/A</p>

	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<p>The following ex-ante fixed values are used as per MR:</p> <p><math>OX_{top\ layer}</math>, Fraction of methane that would be oxidized in the top layer of the SWDS in the baseline: 0.1</p> <p><math>GWP_{CH_4}</math>, Global warming potential of CH<sub>4</sub>: 25 tCO<sub>2</sub>e/tCH<sub>4</sub></p> <p><math>D_{CH_4}</math>, Methane density 0.0007168 tCH<sub>4</sub>/m<sup>3</sup>CH<sub>4</sub></p> <p><math>\square</math>, Model correction factor to account for model uncertainties: 0.75</p> <p><math>F</math>, Fraction of methane in the SWDS gas (volume fraction): 0.5</p> <p><math>f_v</math>, Fraction of methane captured at the SWDS and flared, combusted or used in another manner: 0</p> <p><math>\square_{PJ}</math>, The efficiency of the degassing system which will be installed in the project activity, in year <math>y</math>: 50%</p> <p>MCF, Methane Correction Factor: 1.0</p> <p><math>DOC_j</math>, Fraction of degradable organic carbon (by weight) in the waste type <math>j</math>: Not applicable during verification</p> <p><math>DOC_f</math>, Fraction of degradable organic carbon (DOC) that can decompose: 0.5</p> <p><math>k_j</math>, Decay rate for the waste type <math>j</math>: Not applicable during verification</p> <p><math>FE_{EL,k,y}</math>, CO<sub>2</sub> emissions intensity of the electricity displaced: 0.9488 tCO<sub>2</sub>e/MWh</p> <p><math>\square_{flare,m}</math>, Flare Efficiency in the minute <math>m</math>: 0, 50% or 80% depending on related criteria</p> <p><math>R_u</math>, Universal ideal gases constant: 8,314 Pa.m/kmol.k</p> <p><math>MM_i</math>, Molecular mass of greenhouse gas <math>i</math>: 16.04 kg/kmol for methane</p> <p><math>P_n</math>, Total pressure at normal conditions: 101,325 Pa</p> <p><math>T_n</math>, Temperature at normal conditions: 273.15 K</p> <p><math>SPEC_{flare}</math>: manufacturer's flare specifications for temperature, flow rate and maintenance schedule</p> <p>The values have been applied correctly. The value for the corresponding grid factor has been obtained from a standardized baseline for South Africa.</p>	

### E.6.2. Data and parameters monitored

Means of verification	<p>During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the PDD) have been verified with regard to the</p> <ul style="list-style-type: none"> <li>(i) appropriateness of the applied measurement / determination method,</li> <li>(ii) the correctness of the values applied for ER calculation,</li> <li>(iii) the accuracy, and applied QA/QC measures.</li> </ul> <p>The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5).</p>
Findings	<p>For details please refer to appendix 4</p> <ul style="list-style-type: none"> <li>- CL 01:             <ol style="list-style-type: none"> <li>1. Clarification is requested w.r.t. accuracy class of WIKA TR200 monitoring parameter <math>T_t</math>.</li> <li>2. Flow meters: Clarification is requested w.r.t. the accuracy of the Kurz flow meters as the techn. Specification states an equation based on which the <math>\pm 2\%</math> could not be reproduced.</li> </ol> </li> <li>- CL 02:             <p>SGS calibration reports state -5% to +5% allowable range whereas the MR in D.2 states <math>\pm 2\%</math> accuracy class. Further the results of the field test show an error of 3.6% and 3.1% for the meters and therefore the meter is measuring outside the accuracy class. Pls clarify how this has been considered in the ER calculation.</p> </li> </ul>

	<p>- CAR 03:</p> <ol style="list-style-type: none"> <li>1. Flow meters for flare and engine:             <ol style="list-style-type: none"> <li>a. The validity is not stated for all calibrations. Further specification is requested.</li> <li>b. As per calibrations provided and stated in MR a delay in calibration is identified and related requirements have not been applied yet. Revision requested.</li> </ol> </li> <li>2. <math>T_t</math>: Equipment has been exchanged however only details of one device is mentioned. Further provide the date of exchange. Related specification is requested.</li> <li>3. <math>P_t</math>: QA/QC mentions that the transmitter is calibrated annually as per manufacturer however the manufacturer does not request annual calibration. The PP calibrates annually as per their operation procedures. Revision requested.</li> <li>4. <math>v_{CH_4}</math>: As per calibration certificates for the handheld instrument (Biogas 5000) the accuracy is 0.94% whereas the MR states an accuracy of 0.5%. Please clarify the difference.</li> </ol> <p>- <math>EC_{PJ,y}</math>: As per techn spec and calibration sheet the accuracy is 1.0 instead of 0.5 as per MR.</p>
<b>Conclusion</b>	<input type="checkbox"/> No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/> The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<p>It can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.</p> <p>Further details as per Appendix 4 and 5.</p>

### E.6.3. Implementation of sampling plan

<b>Means of verification</b>	<p>The verification team has been checked whether the PPs have applied a sampling approach to determine the monitored values. Further it has been checked whether the PPs have correctly applied the implemented sampling plan including</p> <ol style="list-style-type: none"> <li>(i) description of the implemented sampling design</li> <li>(ii) collected data</li> <li>(iii) analysis of collected data</li> <li>(iv) demonstration on whether the required confidence/precision has been met.</li> </ol> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /XLS/</li> <li>• /PDD/.</li> </ul>		
<b>Findings</b>	<input checked="" type="checkbox"/> The PPs have not applied sampling approaches for the parameters monitored.		
	<input type="checkbox"/> The PPs have applied sampling approaches for the following parameters monitored.		
	1	Parameter:	
		Name:	
		Description on how the sampling efforts and survey comply with the validated sampling plan:	
	2	Parameter:	
		Name:	

		Description on how the sampling efforts and survey comply with the validated sampling plan:	
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:	
		-	
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.	
	n.a.		

### E.7. Compliance with the calibration frequency requirements for measuring instruments

<b>Means of verification</b>	<p>During the verification the relevant monitoring equipment has been checked whether the calibration requirements have been met; especially if the calibration frequency is in line with the requirements of the validated PDD and/or the applicable calibration standards.</p> <p>The results as well as the verification procedure are described equipment-wise in the project specific verification checklist (Appendix 6).</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /XLS/</li> <li>• /CAL/</li> <li>• /TS/</li> <li>• /OPR/.</li> </ul>		
<b>Findings</b>	<input type="checkbox"/>	Based on the details listed in appendix 6 the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.	
	<input checked="" type="checkbox"/>	<p>Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error or the error identified of the delayed calibration of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</p> <p>From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions.</p> <p>For details please refer to appendix 6</p>	
	<input type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>-</p>	
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.	
	<p>Please refer to Appendix 5 and esp. 6 for detailed assessment of the accuracy of each monitoring parameter and related equipment as well as their calibration dates and validity.</p> <p>Finally one related FAR C4 from previous verification has been addressed accordingly:</p> <p>"It has been identified during verification that the handheld instrument Biogas 5000 for crosscheck on methane content in landfill gas has been calibrated on 15/01/2014 and again 02/02/2015. As the calibration frequency is defined as annually a delay in calibration is identified for the period 15/01/2015 until 01/02/2015. As this is after the end date of this monitoring period this FAR is</p>		

	<p>raised to notify this for next verification.”</p> <p>The Biogas 5000 handheld instrument is not used for direct measurement of the methane content for ER calculation but secondary check of the value measured by the Gascard. Besides during the time of delay of calibration no crosscheck has been conducted but only after the handheld instrument has been calibrated. Therefore the delay in calibration had no influence on the ER calculation.</p> <p>Therefore this finding is closed.</p> <p>Besides that and the already considered delays all monitoring equipment is duly calibrated for this entire monitoring period.</p>
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## E.8. Assessment of data and calculation of emission reductions or net removals

### E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

<b>Means of verification</b>	<p>During the verification the calculation of baseline GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> <li>• <i>Transparency</i>: It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae.</li> <li>• <i>Parameter consistency</i>: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet.</li> <li>• <i>Correctness</i>: It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology.</li> <li>• <i>Completeness</i>: It has been checked whether all calculations are complete and without omissions.</li> </ul> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /XLS/, /WDR/, /REC/, /DSR/, /ELEB/, /ELER/, /GMR/</li> <li>• /ACM1/</li> <li>• /TA/</li> <li>• /PDD/.</li> </ul>								
<b>Findings</b>	<table border="1"> <tr> <td><input type="checkbox"/></td><td> <p>The calculation of the baseline emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information has been identified.</p> </td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>In this context the following CARs, CLs, FARs have been raised:</td></tr> <tr> <td></td><td>CAR 04</td></tr> </table>	<input type="checkbox"/>	<p>The calculation of the baseline emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information has been identified.</p>	<input checked="" type="checkbox"/>	The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:		CAR 04
<input type="checkbox"/>	<p>The calculation of the baseline emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information has been identified.</p>								
<input checked="" type="checkbox"/>	The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.								
<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:								
	CAR 04								
<b>Conclusion</b>	<table border="1"> <tr> <td><input type="checkbox"/></td><td>No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</td></tr> </table> <p>The baseline emissions are calculated as following: As no heat generation takes place at the site which is used and no natural gas is generated which is used e.g. via pipeline or bottles the baseline emissions are calculated as following:</p> $BE = BE_{CH_4,v} + BE_{EC,v}$	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.				
<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.								
<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.								

$BE_{CH_4,y}$  = Baseline emissions of methane from the SWDS in year y  
 $BE_{EC,y}$  = Baseline emissions associated with electricity generation in year y

$$BE_{CH_4} = \left( (1 - OX_{top\_layer}) \cdot F_{CH_4,PJ,y} - F_{CH_4,BL,y} \right) \cdot GWP_{CH_4}$$

$OX_{top\_layer}$  = Fraction of methane in the LFG that would be oxidized in the top layer of the SWDS in the baseline

$F_{CH_4,PJ,y}$  = Amount of methane in the LFG which is flared and/or used in the project activity in year y

$F_{CH_4,BL,y}$  = Amount of methane in the LFG that would be flared in the baseline in year y  
 = 0 tCH<sub>4</sub>/yr

$GWP_{CH_4}$  = Global warming potential of CH<sub>4</sub> (t CO<sub>2</sub>e/t CH<sub>4</sub>)

$$F_{CH_4,PJ,y} = F_{CH_4,flared,y} + F_{CH_4,EL,y}$$

$F_{CH_4,flared,y}$  = Amount of methane in the LFG which is destroyed by flaring in year y

$F_{CH_4,EL,y}$  = Amount of methane in the LFG which is used for electricity generation in year y

$$F_{CH_4,flared,y} = F_{CH_4,sent\_flared,y} - \frac{PE_{Flare,y}}{GWP_{CH_4}}$$

$F_{CH_4,sent\_flared,y}$  = amount of methane in the LFG which is sent to flare in year y

$PE_{flare,y}$  = Project emissions from flaring of the residual gas stream in year y

$$PE_{flare,y} = GWP_{CH_4} \cdot \sum_{n=1}^{525600} F_{CH_4,RG,y} \cdot (1 - \eta_{flare,m}) \cdot 10^{-3}$$

$F_{CH_4,RG,y}$  = mass flow of methane in the residual gas in the minute m (kg)

$\eta_{flare,m}$  = flare efficiency in the minute m

$F_{CH_4,sent\_flare,y}$  and  $F_{CH_4,EL,y}$  are determined via

$$F_{i,t} = V_{t,db} \cdot v_{i,t,db} \cdot \rho_{i,t} \text{ and } \rho_{i,t} = P_t \cdot MM_i / R_u \cdot T_t$$

$F_{i,t}$  = Mass flow of greenhouse gas i in the gaseous stream in time interval t

$V_{t,db}$  = Volumetric flow of the gaseous stream in time interval t on a dry basis

$v_{i,t,db}$  = Volumetric fraction of greenhouse gas i in the gaseous stream in a time interval t on a dry basis

$\rho_{i,t}$  = Density of greenhouse gas i in the gaseous stream in time interval t

$P_t$  = Absolute pressure of the gaseous stream in time interval t

$MM_i$  = Molecular mass of greenhouse gas i

$R_u$  = Universal ideal gases constant

$T_t$  = Temperature of the gaseous stream in time interval t (K)

$$BE_{EC,y} = \sum_k EC_{BL,k,y} \cdot EF_{EL,k,y} \cdot (1 + TDL_{k,y})$$

$EC_{BL,k,y}$  = the quantity of electricity that would be consumed by the baseline electricity consumption source k during the year y

$EF_{EL,k,y}$  = the emission factor for the grid in year y

$TDL_{k,y}$  = the average technical transmission and distribution losses in the grid in the year y for the voltage level at which electricity is obtained from the grid at the project site.

A spreadsheet has been provided for each month with underlying data as obtained from the DCS as well as a monthly summary spreadsheet including the overall summary.

Where corrections were required a revised baseline emissions calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct.



**E.8.2. Calculation of project GHG emissions or actual net GHG removals by sinks**

<b>Means of verification</b>	<p>During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> <li>• Transparency: It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae.</li> <li>• Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet.</li> <li>• Correctness: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology.</li> <li>• Completeness: It has been checked whether all calculations are complete and without omissions.</li> </ul> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /XLS/, /WDR/, /REC/, /DSR/, /ELEB/, /ELER/, /GMR/</li> <li>• /ACM1/</li> <li>• /TA/</li> <li>• /PDD/.</li> </ul>						
<b>Findings</b>	<table border="1"> <tr> <td data-bbox="462 824 534 1160"><input type="checkbox"/></td><td data-bbox="534 824 1412 1160"> <p>The calculation of the project emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p> </td></tr> <tr> <td data-bbox="462 1160 534 1227"><input checked="" type="checkbox"/></td><td data-bbox="534 1160 1412 1227"> <p>The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.</p> </td></tr> <tr> <td data-bbox="462 1227 534 1294"><input checked="" type="checkbox"/></td><td data-bbox="534 1227 1412 1294"> <p>In this context the following CARs, CLs, FARs have been raised:</p> <p>CAR 4</p> </td></tr> </table>	<input type="checkbox"/>	<p>The calculation of the project emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>	<input checked="" type="checkbox"/>	<p>The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.</p>	<input checked="" type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>CAR 4</p>
<input type="checkbox"/>	<p>The calculation of the project emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>						
<input checked="" type="checkbox"/>	<p>The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.</p>						
<input checked="" type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>CAR 4</p>						
<b>Conclusion</b>	<table border="1"> <tr> <td data-bbox="462 1294 534 1361"><input type="checkbox"/></td><td data-bbox="534 1294 1412 1361"> <p>No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</p> </td></tr> <tr> <td data-bbox="462 1361 534 1451"><input checked="" type="checkbox"/></td><td data-bbox="534 1361 1412 1451"> <p>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p> </td></tr> </table> <p>Project emissions: Total project emissions are the sum of project emissions due to elec. consumption, use of fossil fuel and distribution of compressed/liquefied LFG using trucks.</p> <p>As there is no distribution of LFG and no consumption of fossil fuels, project emissions are calculated as follows:</p> $PE_{EC,y} = PE_{EC,y}$ <p>PE<sub>y</sub> = Project emissions in year y (t CO<sub>2</sub>/yr)</p> <p>PE<sub>EC,y</sub> = Emissions from consumption of electricity due to the project activity in year y (t CO<sub>2</sub>/yr)</p> $PE_{EC,y} = \sum_j EC_{PJ,j,y} \cdot EF_{EL,j,y} \cdot (1 + TDL_{j,y})$ <p>EC<sub>PJ,j,y</sub> = the quantity of electricity consumed by the project activity during the year y (MWh)</p> <p>EF<sub>EL,j,y</sub> = the emission factor for the grid in year y</p> <p>TDL<sub>i,y</sub> = the average technical transmission and distribution losses in the grid in the year y for the voltage level at which electricity is obtained from the grid at the project site</p> <p>A spreadsheet has been provided for each month with underlying data as</p>	<input type="checkbox"/>	<p>No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</p>	<input checked="" type="checkbox"/>	<p>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p>		
<input type="checkbox"/>	<p>No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</p>						
<input checked="" type="checkbox"/>	<p>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p>						

	<p>obtained from the DCS as well as a monthly summary spreadsheet including the overall summary.</p> <p>Where corrections were required a revised PE calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct.</p>
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### E.8.3. Calculation of leakage GHG emissions

<b>Means of verification</b>	<p>During the verification it has been checked whether leakage emissions have to be considered and, in cases where leakage emissions have to be calculated, the respective calculation of leakage GHG emissions has been checked. In such cases the same verification principles have been considered as for the baseline and project emissions calculation. Please refer to E.8.1 and E.8.2.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /XLS/, /WDR/, /REC/, /DSR/, /ELEB/, /ELER/, /GMR/</li> <li>• /ACM1/</li> <li>• /TA/</li> <li>• /PDD/.</li> </ul>								
<b>Findings</b>	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>No leakage emissions were to be considered (<math>LE_y = 0</math>).</td></tr> <tr> <td><input type="checkbox"/></td><td> <p>The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see 8.1 and 8.2).</p> <p>The calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in leakage emissions calculations have been justified. Where applicable, appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p> </td></tr> <tr> <td><input type="checkbox"/></td><td>The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.</td></tr> <tr> <td><input type="checkbox"/></td><td>In this context the following CARs, CLs, FARs have been raised:</td></tr> </table>	<input checked="" type="checkbox"/>	No leakage emissions were to be considered ( $LE_y = 0$ ).	<input type="checkbox"/>	<p>The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see 8.1 and 8.2).</p> <p>The calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in leakage emissions calculations have been justified. Where applicable, appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>	<input type="checkbox"/>	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
<input checked="" type="checkbox"/>	No leakage emissions were to be considered ( $LE_y = 0$ ).								
<input type="checkbox"/>	<p>The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see 8.1 and 8.2).</p> <p>The calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in leakage emissions calculations have been justified. Where applicable, appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>								
<input type="checkbox"/>	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.								
<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:								
<b>Conclusion</b>	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</td></tr> <tr> <td><input type="checkbox"/></td><td>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</td></tr> </table> <p>Leakage: No leakage is applicable based on methodology. Therefore <math>LE_y = 0</math></p>	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.				
<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.								
<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.								

### E.8.4. Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

<b>Means of verification</b>	<p>The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately</p> <ul style="list-style-type: none"> <li>- Total baseline emissions,</li> <li>- Total project emissions,</li> <li>- Total leakage,</li> <li>- Total emission reductions.</li> </ul> <p>It has been assessed whether the values are correct or need to be revised as a consequence of issues identified above.</p>						
<b>Findings</b>	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>Section E.4 of the MR includes in a summary table of the emission reductions calculation.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.</td></tr> <tr> <td><input type="checkbox"/></td><td>The values as specified in the ER summary table are correct; no issues have been identified during the verification which requires changes in</td></tr> </table>	<input checked="" type="checkbox"/>	Section E.4 of the MR includes in a summary table of the emission reductions calculation.	<input checked="" type="checkbox"/>	The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.	<input type="checkbox"/>	The values as specified in the ER summary table are correct; no issues have been identified during the verification which requires changes in
<input checked="" type="checkbox"/>	Section E.4 of the MR includes in a summary table of the emission reductions calculation.						
<input checked="" type="checkbox"/>	The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.						
<input type="checkbox"/>	The values as specified in the ER summary table are correct; no issues have been identified during the verification which requires changes in						

		the ER calculation.
	<input checked="" type="checkbox"/>	During the verification issues with impact on the ER calculation have been identified.
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CAR 04
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The final emission reductions are the difference between baseline emissions and project as well as leakage emissions:  Initially as per published MR: $ER_y = BE_y - PE_y$ $= 73,729 \text{ t CO}_2\text{e} - 567 \text{ t CO}_2\text{e}$ $= 73,162 \text{ t CO}_2\text{e}$ (due to rounding)  Final as per latest MR: $ER_y = BE_y - PE_y$ $= 73,032 \text{ t CO}_2\text{e} - 567 \text{ t CO}_2\text{e}$ $= 72,465 \text{ t CO}_2\text{e}$ (due to rounding)

#### E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	The verification team has checked if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD. It has further checked which of the below listed cases is applicable for the calculated ER of the current monitoring period.	
Findings	<input checked="" type="checkbox"/>	Case 1: The ex-ante estimated value was found to be proportionally higher than the ex-post determined value. No further action is deemed required.
	<input type="checkbox"/>	Case 2: The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.
	<input type="checkbox"/>	Case 3: The ex-ante estimated value was found to be proportionally lower than the ex-post determined value.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

#### E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered PDD (E.8.5) the verification team has checked whether (in case 3) an appropriate explanation is included in the MR.	
Findings	<input checked="" type="checkbox"/>	No further justification or explanation is deemed required as actual emissions of this MP do not exceed significantly the ex-ante calculated emission reductions (applicable for case 1 and 2).
	<input type="checkbox"/>	For case 3: The PP has provided a related justification in the MR. The reasons for the increase are as follows: - N/A
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings

	could be closed out. For details please refer to Appendix 4.
	As the achieved amount of emission reductions is lower than the ex-ante calculated value for this monitoring period no further justification is required.

#### E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

<b>Means of verification</b>	The verification team has checked chapter E.7 of the MR and the emission reduction calculation sheet /XLS/.								
<b>Findings</b>	<p><input checked="" type="checkbox"/> The MR in section E.7 includes a summary table of the ER breakdown</p> <p style="margin-left: 40px;">a) <i>ER up to 2012-12-31 and</i></p> <p style="margin-left: 40px;">b) <i>ER from 2013-01-01 onwards</i></p> <p><input checked="" type="checkbox"/> The breakdown of the ERs during the first commitment period and from 2013-01-01 onwards is as follows:</p> <p><input type="checkbox"/> The ER have completely been generated during the first commitment period</p> <p style="margin-left: 40px;"><input checked="" type="checkbox"/> The ERs have completely been generated from 2013-01-01 onwards,</p> <p style="margin-left: 40px;"><input type="checkbox"/> The ERs have partly been generated during the first commitment period and partly from 2013-01-01 onwards.</p> <p><input checked="" type="checkbox"/> The breakdown of the ERs is correct, considering the applicable guidance.</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th></th><th>until 2012-12-31 <sup>1)</sup></th><th>from 2013-01-01 <sup>1)</sup></th><th>Sum</th></tr> </thead> <tbody> <tr> <td>Emission reductions [tCO<sub>2e</sub>]</td><td style="text-align: center;">0</td><td style="text-align: center;">72,465</td><td style="text-align: center;">72,465</td></tr> </tbody> </table> <p><sup>1)</sup> Both days included</p>		until 2012-12-31 <sup>1)</sup>	from 2013-01-01 <sup>1)</sup>	Sum	Emission reductions [tCO <sub>2e</sub> ]	0	72,465	72,465
	until 2012-12-31 <sup>1)</sup>	from 2013-01-01 <sup>1)</sup>	Sum						
Emission reductions [tCO <sub>2e</sub> ]	0	72,465	72,465						
<b>Conclusion</b>	<p><input checked="" type="checkbox"/> No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</p> <p><input type="checkbox"/> The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p> <p>The data provided in the MR is correct as well as the related breakdown. The pro-rata approach was correctly applied to the calculations of GHG emission reductions or net anthropogenic GHG removals in accordance with the project standard, as the monitoring period starts before 31 December 2012 and ends anytime thereafter.</p>								

### SECTION F. Internal quality control

Before the submission of the final verification report a technical review of the whole verification procedure was carried out. The technical reviewers are competent GHG auditors where at least one is being appointed for the scope this project falls under. The technical reviewers are not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may have been confirmed or revised. Furthermore reporting improvements might have been achieved.

After the successful technical review an overall (esp. procedural) assessment of the complete verification has been carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the submission for requesting for issuance is conducted.

**SECTION G. Verification opinion**

The International Bank for Reconstruction and Development (IBRD), as Trustee of the Prototype Carbon Fund (PCF) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 2<sup>nd</sup> periodic verification of the 2<sup>nd</sup> crediting period of the project: "Durban Landfill-gas-to-electricity project – Mariannhill and La Mercy Landfills", with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to collection and destruction of methane contained in landfill gas and substitution of mainly fossil fuel generated electricity from the connected grid. This verification covers the period from 01/10/2014 to 30/09/2016 (including both days).

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document,
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., ACM0001 ver. 15 as well as approved standardized baseline ASB0001,
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately,
- the monitoring system is in place and functional. The project has generated GHG emission reductions,
- the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

TÜV NORD JI/CDM CP further confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **72,465 tCO<sub>2e</sub>**.

**SECTION H. Certification statement**

As a duly accredited DOE, TÜV NORD CERT confirms that the project

"Durban Landfill-gas-to-electricity project – Mariannhill and La Mercy Landfills"

registered under

UNFCCC-No. : 0545

has achieved emission reductions in accordance with all applicable requirements for registered CDM project activities during the current monitoring period

MP-No.: 02 of 2<sup>nd</sup> CP

from: 01/10/2014

to: 30/09/2016

(including both days) as follows:

Emission reductions: **72,465 tCO<sub>2e</sub>**.

Essen, 13/04/2017




Stefan Winter  
Team leader

## Appendix 1. Abbreviations

Abbreviations	Full texts
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO <sub>2</sub>	Carbon dioxide
CO <sub>2eq</sub>	Carbon dioxide equivalent
CL	Clarification Request
DVerR	Draft Verification Report
DWS	Durban metro Water Services
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IM	Interview Memo
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
PDD	Project Design Document
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
XLS	Emission Reduction Calculation Spread Sheet

## Appendix 2. Competence of team members and technical reviewers



**Statement of Competence**  
Appointment and authorization according to the procedures  
of the TUV NORD J/CDM Certification Program

**Mr. Stefan Winter**


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2017-07-27
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2017-07-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
4.1	Cement and lime production
4.2	Paper
5.2	Caprolactam, nitric and adipic acid
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
13.1	Solid waste and wastewater
13.2	Manure

163 – Rev. 4, Date: 2015-01-05

163\_001-VA050-F20\_2015-01-05\_rev4.docx      501-VA050-F20-wk3 / 2013-10-25



**Statement of Competence**  
Appointment and authorization according to the procedures  
of the TUV NORD J/CDM Certification Program

**Mr. Grzegorz Kochaniewicz**


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2019-02-08
VCS / ISO 14064-2	Senior Assessor	2019-02-08

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy Demand
14.1	Afforestation and Reforestation

173 - Rev. 7, Date: 2016-02-09

173\_001-VA050-F20\_2016-02-09\_e7.docx      501-VA050-F20-wk3 / 2013-10-25



**Statement of Competence**  
Appointment and authorization according to the procedures  
of the TUV NORD J/CDM Certification Program

**Mr. Martin Saalmann**


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2019-11-10
J1	Senior Assessor Technical Reviewer	2019-11-10
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2019-11-10

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
13.1	Solid waste and wastewater

022 – Rev. 6, Date: 2015-11-11

022\_001-VA050-F20\_2015-11-11\_rev6.docx      501-VA050-F20-wk3 / 2013-10-25



**Statement of Competence**  
Appointment and authorization according to the procedures  
of the TUV NORD J/CDM Certification Program

**Mr. David Lubanga**

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2019-10-20
VCS / ISO 14064-2	Lead Assessor	2019-10-20

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand

251 - Rev. 4, Date: 2015-10-21

251\_001-VA050-F20\_2015-10-21\_rev4.docx      501-VA050-F20-wk3 / 2013-10-25



## Appendix 3. Documents reviewed or referenced

No.	Author	Reference	Title	References to the document	Provider
1	UNFCCC	<b>/ACM1/</b>	ACM0001 ver. 15 “Large-scale Consolidated Methodology: Flaring or use of landfill gas”  ASB0001 ver. 1 “Grid emission factor for the Southern African power pool”		Other
2	DOE	<b>/CPM/</b>	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)		Other
3	IPCC	<b>/IPCC/</b>	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	<a href="http://www.ipcc-nggip.iges.or.jp">www.ipcc-nggip.iges.or.jp</a>	Other
4	UNFCCC	<b>/KPI/</b>	Kyoto Protocol (1997)	<a href="http://unfccc.int/kyoto_protocol/items/2830.php">http://unfccc.int/kyoto_protocol/items/2830.php</a>	Other
5	UNFCCC	<b>/MA/</b>	Decision 3/CMP. 1 (Marrakesh – Accords)	<a href="http://cdm.unfccc.int/Reference/COPMOP/index.html">http://cdm.unfccc.int/Reference/COPMOP/index.html</a>	Other
6	PP	<b>/MR/</b>	Monitoring Report for CDM project: “Durban Landfill-gas-to-electricity project – Mariannhill and La Mercy Landfills” - version 1, dated 02/11/2016 - version 2, dated 14/02/2017		Other
7	UNFCCC	<b>/MRT/</b>	Monitoring Report Form (CDM-MR-FORM), Version 5.1	<a href="https://cdm.unfccc.int/Reference/PDDs_Forms/index.html">https://cdm.unfccc.int/Reference/PDDs_Forms/index.html</a>	Other
8	UNFCCC	<b>/PDD/</b>	Project Design Document for CDM project: “Durban landfill-Gas-to-Electricity Project – Mariannhill and La Mercy Landfills”, version 4, dated 30/06/2015	<a href="http://cdm.unfccc.int/Projects/DB/TUEV-SUED1154520464.04/view">http://cdm.unfccc.int/Projects/DB/TUEV-SUED1154520464.04/view</a>	Other
9	UNFCCC	<b>/PS/</b>	CDM Project Standard (Version 9.0)	<a href="http://cdm.unfccc.int/Reference/Standards/index.html">http://cdm.unfccc.int/Reference/Standards/index.html</a>	Other
10	PP	<b>/VAL/</b>	Validation Report for CDM project “Durban landfill-Gas-to-Electricity Project – Mariannhill and La Mercy Landfills” version 2, dated 31/01/2014 Assessment opinion regarding Post Registration Changes for CDM project “Durban landfill-Gas-to-Electricity Project – Mariannhill and	<a href="http://cdm.unfccc.int/Projects/DB/TUEV-SUED1154520464.04/view">http://cdm.unfccc.int/Projects/DB/TUEV-SUED1154520464.04/view</a>	Other

No.	Author	Reference	Title	References to the document	Provider
			La Mercy Landfills" version 0, dated 15/07/2015		
11	PP	<b>/VER/</b>	Documents of previous verifications (Monitoring report, verification report, ER calculation sheet)	<a href="http://cdm.unfccc.int/Projects/DB/TUEV-SUED1154520464.04/view">http://cdm.unfccc.int/Projects/DB/TUEV-SUED1154520464.04/view</a>	Other
12	UNFCCC	<b>/VVS/</b>	CDM Validation and Verification Standard (Version 09.0)	<a href="http://cdm.unfccc.int/Reference/Standards/index.html">http://cdm.unfccc.int/Reference/Standards/index.html</a>	Other
13	UNFCCC	<b>/SAMPLE/</b>	"Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities" (Version 03.0) "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities" (version 4.1)	<a href="https://cdm.unfccc.int/Reference/Guidclarif/index.html">https://cdm.unfccc.int/Reference/Guidclarif/index.html</a> <a href="http://cdm.unfccc.int/Reference/Standards/index.html">http://cdm.unfccc.int/Reference/Standards/index.html</a>	Other
14	UNFCCC	<b>/TA/</b>	<ul style="list-style-type: none"> <li>• Tool to calculate project or leakage CO2 emissions from fossil fuel combustion Version 2</li> <li>• Emissions from solid waste disposal sites Version 7</li> <li>• Project emissions from flaring Version 2.0.0</li> <li>• Tool to calculate the emission factor for an electricity system Version 4.0</li> <li>• Tool to determine the mass flow of a greenhouse gas in a gaseous stream Version 2.0.0</li> <li>• Tool to determine the baseline efficiency of thermal or electric energy generation systems Version 1</li> <li>• Project and leakage emissions from transportation of freight Version 1.1.0</li> </ul>	<a href="http://cdm.unfccc.int/Reference/tools/index.html">http://cdm.unfccc.int/Reference/tools/index.html</a>	Other
15	UNFCCC	<b>/GOT/</b>	Glossary "CDM terms" (version 08.0)	<a href="https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=UmZ8bnFjODI3fDCW9A3vJwR03kQQh4sbLiYu">https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=UmZ8bnFjODI3fDCW9A3vJwR03kQQh4sbLiYu</a>	Other
16	Other	<b>/GRC/</b>	NRS 057 SANA 474 (South African Grid Code)		Other
17	Other	<b>/CAL/</b>	Certificate of Calibration of pressure transmitter; Certificate of Calibration of flow		PP

No.	Author	Reference	Title	References to the document	Provider
			<p>meters (Kurz and E+H);</p> <p>Certificate of Calibration (Gascard NG);</p> <p>Certificate of Calibration of flame detector;</p> <p>Calibration of exhaust gas temp.,</p> <p>Calibration of Gas Cylinders;</p> <p>Calibration of elec meters and confirmation Email of replacement date;</p> <p>Calibration of weigh bridges;</p> <p>Calibration of handheld gas analyzer;</p> <p>Field check reports by E+H dt 23/06/2016;</p> <p>Letter by Edinburgh Instrument on stationary gas analyzer regarding site calibration checks not dated;</p> <p>Letter by NIC Instruments Natal on calibration interval as per manufacturer dated 27/03/2015</p>		
18	I can~do and Envitech solutions	<b>/CAUD/</b>	Permit Compliance Audit of the Mariannhill G:L:B+ Landfill Site Located on Sub Lot 79 of Zeenoegat No 937, Kwazulu Natal: Permit No: B33/2/1920/27/1/P241, dated July 2015 and January 2016 as well as September 2016.		PP
19	PP	<b>/COM/</b>	Contingency Management Plan. Cleansing and Solid Waste DSW, Mariannhill Landfill Site		PP
20		<b>/DAT/</b>	MH Site Record Sheet from 2014-10 to 2016-09		PP
21	Envitech Solution	<b>/DPR/</b>	CDM Data Processing: Step by Step Methodology (Envitech Solution)		PP
22	Envitech Solution	<b>/DSR/</b>	Daily site record sheet (Envitech Solution)		PP
23		<b>/ELEB/</b>	Monthly Electricity Billing spreadsheet		PP
24		<b>/ELER/</b>	Monthly Electricity Reading by metering department		PP
25	Eskom	<b>/ESK/</b>	Eskom Integrated Results for the year ended 31 March 2015 and 31 March 2016 (Fact Sheets)		PP
26	SGS	<b>/FMA/</b>	Test Report: Mariannhill Landfill Flow Meter Audits, dated 26/11/2014		PP
27	Envitech Solution	<b>/GMR/</b>	Monthly GAS WELL MONITORING REPORT: MARIANNHILL LANDFILL SITE for the entire monitoring period		PP
28	GE	<b>/HRT/</b>	Heat Rate Testing – GE Jenbacher		PP

No.	Author	Reference	Title	References to the document	Provider
	Jenbacher		320 Series Engines, dated February 2014		
29		<b>/LPL/</b>	Mariannhill overall gas wells October 2014 (drawing)		PP
30		<b>/MCL/</b>	Methodology for the Calculation of CERs for the Durban/World Bank CDM Landfill Gas to Electricity Project (Version 4, August 2014)		PP
31		<b>/WDR/</b>	Waste delivery record		PP
32		<b>/OPR/</b>	Durban Gas to Electricity CDM Project: Operation & Maintenance (Minutes of Meeting 51 Held on 17 June 2014) DWS Report for solid waste management in the Durban metroplolitan area, Nov 1998 Email by Rajesh Ramlagan (fleet manager) providing list of all vehicles used to collect waste in respective districts.		PP
33		<b>/REC/</b>	Mariannhill Monthly Report 2014B 22 13_15-Excel		PP
34	Various suppliers	<b>/TS/</b>	<ul style="list-style-type: none"> <li>Resistance Thermometers, Model WIKA TR200 (data sheet)</li> <li>WIKA Instruments Manufacturer_TR200_Letter</li> <li>Pressure Transmitters PTX 7900 Series (data sheet)</li> <li>GA5000 Portable gas analyser (technical specification);</li> <li>Biogas 5000 Gas Analyser. Operating Manual;</li> <li>Gascard NG infrared Gas Monitoring Users Manual</li> <li>Series 353FT Insertion Mass Flow Transmitter User's Guide</li> <li>E+H Omnigrad M TR10 temperature transmitter</li> </ul>		PP
35		<b>/TRAIN/</b>	Trainings records: <ul style="list-style-type: none"> <li>Certificate; Field Tech Basic Training, training dates: 03.05.2010 to 07.05.2010</li> <li>Operation and Maintenance SC Flare Stack</li> <li>Operation and Maintenance Gas Booster</li> </ul>		PP
36		<b>/XLS/</b>	Initial and final Emission reduction calculation summary spreadsheet Initial and final monthly CDM Data spreadsheets including raw data from the digital control system by Envitech Solutions		PP

## Appendix 4. Clarification requests, corrective action requests and forward action requests

**Table 3. Remaining FAR from validation and/or previous verification**

<b>FAR ID</b>	B4	<b>Section no.</b>		<b>Date:</b> 27/11/2014
<b>Description of FAR</b>				
The PP intends to physically shut down the gas connection to and from the baseline wells as those do not produce any LFG anymore and would like to use the related flow meter as spare part. During next verification it is to be checked whether the baseline collecting system has been physically cut off.				
<b>Project participant response (1<sup>st</sup> round)</b>				<b>Date:</b> 01/02/2017
Forwarded pictures of the cut-off.				
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>				
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input checked="" type="checkbox"/>	Other:	Pictures of the cut off		
<b>DOE assessment (1<sup>st</sup> round)</b>				<b>Date:</b> 01/02/2017
As per call with employee, onsite picture and interview with PP the baseline collecting system cell has been physically cut-off. For substantiation pictures have been forwarded when the pipeline has been cut off.				
Therefore this finding is closed.				
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

<b>FAR ID</b>	C4	<b>Section No.</b>		<b>Date:</b> 27/11/2014
<b>Description of FAR</b>				
It has been identified during verification that the handheld instrument Biogas 5000 for crosscheck on methane content in landfill gas has been calibrated on 15/01/2014 and again 02/02/2015. As the calibration frequency is defined as annually a delay in calibration is identified for the period 15/01/2015 until 01/02/2015. As this is after the end date of this monitoring period this FAR is raised to notify this for next verification.				
<b>Project participant response</b>				<b>Date:</b> 01/02/2017
The handheld analyser is only used during landfill gas monitoring and when carrying out on site checks to verify the gas quality. During the periods 15/01/2015 – 02/02/2015 and 02/02/2016 – 05/02/2016 the analyser was not required. If an analyser is required when G500625 goes for calibration, the manufacturer provides a loan unit, however it was not required this time.				
<b>Documentation provided by project participant</b>				
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
<b>DOE assessment</b>				<b>Date:</b> 01/02/2017
The Biogas 5000 handheld instrument is not used for direct measurement of the methane content for ER calculation but secondary check of the value measured by the Gascard. Besides during the time of delay of calibration no crosscheck has been conducted but only after the handheld instrument has been calibrated. Therefore the delay in calibration had no influence on the ER calculation.				
Therefore this finding is closed.				
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

<b>FAR ID</b>	D4	<b>Section No.</b>		<b>Date:</b> 02/03/2016
<b>Description of FAR</b>				
Further all flow meters have been exchanged to E+H 65i flow meters. Related technical specifications have been provided. Further as per statement provided by E+H the accuracy of the current installation is of 4% without flow conditioner dated 24/02/2015. Further E+H recommends an annual on-site verification test, if the test fails the equipment to their factory for calibration. The same is to be checked during next verification.				
<b>Project participant response</b>				<b>Date:</b> 01/02/2017
Verification tests conducted 23/06/2016. Related supporting provided.				
<b>Documentation provided by project participant</b>				
<input type="checkbox"/> Changes in the PDD	Section(s):		New version No.:	
<input type="checkbox"/> Changes in MR	Section(s):		New version No.:	
<input type="checkbox"/> Changes in XLS	Worksheet(s):		New version No.:	
<input checked="" type="checkbox"/> Other:	Field check reports by E+H dt 23/06/2016			
<b>DOE assessment</b>				<b>Date:</b> 01/02/2017
As per document provided by PP a verification field tests have been conducted on 23/06/2016. The E+H flow meters have been installed on 02/06/2015. Therefore, until today only one annual test had to be conducted. Based on that the above condition by the manufacturer is fulfilled and the finding is closed.				
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

**Table 4. CL from this verification**

<b>CL ID</b>	01	<b>Section no.</b>	D.2	<b>Date:</b> 01/02/2017
<b>Description of CL</b>				
1. Clarification is requested w.r.t. accuracy class of WIKA TR200 monitoring parameter T <sub>t</sub> . 2. Flow meters: Clarification is requested w.r.t. the accuracy of the Kurz flow meters as the techn. Specification states an equation based on which the +/-2% could not be reproduced.				
<b>Project participant response (1<sup>st</sup> round)</b>				<b>Date:</b> 14/02/2017
1. The formula for the accuracy of the WIKA TR200 temperature transmitter from the manufacturer's documentation is "0.3+0.005 (t)". The range of the instrument is 100°C so therefore the maximum error is 0.8°C. The WIKA TR200 was changed for an E&H Omnigrad TR10 temperature transmitter on 25/02/2016. The accuracy formula for the E&H Omnigrad TR10 is +/- (0.15+0.002(t)). The range of the instrument is 100°C so therefore the maximum error is 0.35°C (document TI00256ten_0111.pdf added to the project file '170201 CLs – CL1' on Dropbox). This does not affect the ER calculations. D2 of the Monitoring Report has been amended to state the appropriate maximum error for each instrument. 2. The accuracy of the Kurz flow meters is +/- 2%+20SFPM. The Monitoring Report has been amended to reflect this value. The results from SGS flow meter field audits have been used for the calculation of ERs (document GS528 Mariannhill Landfill Flow Meter Audits 21Oct2014(3).pdf added to the project file '170201 CLs – CL1' on Dropbox). Reductions of 3.1% for the engine flow meter and 3.6% for the flare flow meter have been applied for the respective periods of operation as these are more conservative values than the maximum accuracy value quoted by Kurz.				
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>				
<input type="checkbox"/> Changes in the PDD	Section(s):		New version No.:	
<input checked="" type="checkbox"/> Changes in MR	Section(s): D.2		New version No.: 2	
<input type="checkbox"/> Changes in XLS	Worksheet(s):		New version No.:	
<input checked="" type="checkbox"/> Other:	Technical information Omnigrad M TR10 (TI00256ten_0111.pdf)			
<b>DOE assessment (1<sup>st</sup> round)</b>				<b>Date:</b> 01/03/2017

<p>1. As checked by related technical information the accuracy of the CL B WIKA TR200 is <math>0.3+0.005 \times t</math>. As the meter is used over the entire range up to <math>100^{\circ}\text{C}</math> the maximum accuracy is therefore <math>0.3+0.005 \times 100 = 0.8^{\circ}\text{C}</math>. The MR has been revised accordingly.</p> <p>2. As per technical specification the accuracy is determined via following equation <math>\pm 2\%+20\text{SFPM}</math> (Standard Feet Per Minute). The MR has been revised accordingly. Further field tests by SGS showed accuracies of 3.1% for engine flow meter and 3.6% for flare flow meter. As these are beyond 2% the PP deducted conservatively for the operation period from 01/10/2014 to 02/06/2015 (on which E+H flow meter has been installed) to the ER calculation. DOE has checked the ER spreadsheet and can confirm that for this period the related error has been conservatively considered resulting in less emission reductions.</p>	
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

<b>CL ID</b>	02	<b>Section no.</b>	D.2	<b>Date:</b> 01/02/2017
<b>Description of CL</b>				
SGS calibration reports state -5% to +5% allowable range whereas the MR in D.2 states $\pm 2\%$ accuracy class. Further the results of the field test show an error of 3.6% and 3.1% for the meters and therefore the meter is measuring outside the accuracy class. Pls clarify how this has been considered in the ER calculation.				
<b>Project participant response (1<sup>st</sup> round)</b>				<b>Date:</b> 14/02/2017
All readings for the flare and engine flow meters have been reduced by 3.6% and 3.1% respectively for the period when the Kurz instruments were still in use (October 2014 – June 2015) as a conservative approach when compared to the manufacturers stated accuracy of $\pm 2\%+20\text{SFPM}$ . (See comments for CL1.2 above).				
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>				
<input type="checkbox"/> Changes in the PDD	Section(s):		New version No.:	
<input checked="" type="checkbox"/> Changes in MR	Section(s):		New version No.: 2	
<input checked="" type="checkbox"/> Changes in XLS	Worksheet(s):		New version No.:	
<input checked="" type="checkbox"/> Other:	KURZ Instrument Series 454FT Users Guide			
<b>DOE assessment (1<sup>st</sup> round)</b>				<b>Date:</b> 01/03/2017
As per technical specification the accuracy is determined via following equation $\pm 2\%+20\text{SFPM}$ (Standard Feet Per Minute). The MR has been revised accordingly. Further field tests by SGS showed accuracies of 3.1% for engine flow meter and 3.6% for flare flow meter. As these are beyond 2% the PP deducted conservatively for the operation period from 01/10/2014 to 02/06/2015 (on which E+H flow meter has been installed) to the ER calculation. DOE has checked the ER spreadsheet and can confirm that for this period the related error has been conservatively considered resulting in less emission reductions.				
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

Table 5. CAR from this verification

<b>CAR ID</b>	01	<b>Section no.</b>	B.1	<b>Date:</b> 01/02/2017
<b>Description of CAR</b>				
During onsite inspection it has been identified that the downtime data is not full consistent with the data checked in the DCS at project location. Clarification and revision is requested.				
<b>Project participant response (1<sup>st</sup> round)</b>				
All data have been reviewed and are now in order with the raw data and site monitoring sheets. Please see revised monthly ER spreadsheets uploaded to the project file on Dropbox and updated Monitoring Report attached.				
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>				<b>Date:</b> 14/02/2017
<input type="checkbox"/> Changes in the PDD	Section(s):		New version No.:	
<input checked="" type="checkbox"/> Changes in MR	Section(s): B.1		New version No.: 2	
<input type="checkbox"/> Changes in XLS	Worksheet(s):		New version No.:	
<input type="checkbox"/> Other:				
<b>DOE assessment (1<sup>st</sup> round)</b>				<b>Date:</b> 01/03/2017

Based on raw data check during onsite inspection and the found inconsistencies the MR has now been updated accordingly to reflect all related downtimes mainly due to power failures of the grid and maintenance correctly. The MR has been revised accordingly.

**Conclusion**  
Tick the appropriate checkbox

- ☐ Additional action should be taken (finding remains open)  
☒ The finding is closed

<b>CAR ID</b>	02	<b>Section no.</b>	B.2.2	<b>Date:</b> 01/02/2017
<b>Description of CAR</b>				
MR states that a PRC #PRC-545-0002 has been submitted without prior approval. This is inconsistent to data found on related UNFCCC project webpage. As per related PRC assessment report the PRC has been prior approved before Rflss of previous monitoring period. Clarification and revision is requested.				
<b>Project participant response (1<sup>st</sup> round)</b>				
Reference to prior approval deleted. B2.2 of the MR to now state  "For this crediting period, several monitoring parameters were corrected in accordance with ACM0001 version 15 and relevant tools. The flow diagram and information for parties' involvement was corrected among other editorial changes. The corrections were submitted together with the request for permanent changes from the registered monitoring plan (see summary in section B.2.5 below) and approved on 12/10/2015. For details, please refer to the-revised PDD dated 30/06/2015 (reference No.: PRC-0545-002) (available <a href="#">here</a> ).				
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>				<b>Date:</b> 14/02/2017
<input type="checkbox"/> Changes in the PDD	Section(s):		New version No.:	
<input checked="" type="checkbox"/> Changes in MR	Section(s): B.2.2		New version No.: 2	
<input type="checkbox"/> Changes in XLS	Worksheet(s):		New version No.:	
<input type="checkbox"/> Other:				
<b>DOE assessment (1<sup>st</sup> round)</b>				<b>Date:</b> 01/03/2017
The MR has been updated in line with instructions to fill the MR by providing the reason of the PRC as well as the approval date and number. Further the MR has been revised to state that the PRC has been prior approved.  Reference to PRC-0545-001 has been deleted as this was conducted and applicable to documents for crediting period one and project documentation has been changed and updated during course of renewal of crediting period.				
<b>Conclusion</b> Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

<b>CAR ID</b>	03	<b>Section no.</b>	D.2	<b>Date:</b> 01/02/2017
<b>Description of CAR</b>				
Following issues have been identified w.r.t. monitoring parameters section D.6.2 of MR:				
<ol style="list-style-type: none"> <li>Flow meters for flare and engine: <ol style="list-style-type: none"> <li>The validity is not stated for all calibrations. Further specification is requested.</li> <li>As per calibrations provided and stated in MR a delay in calibration is identified and related requirements have not been applied yet. Revision requested.</li> </ol> </li> <li>T<sub>i</sub>: Equipment has been exchanged however only details of one device is mentioned. Further provide the date of exchange. Related specification is requested.</li> <li>P<sub>i</sub>: QA/QC mentions that the transmitter is calibrated annually as per manufacturer however the manufacturer does not request annual calibration. The PP calibrates annually as per their operation procedures. Revision requested.</li> <li>v<sub>CH4</sub>: As per calibration certificates for the handheld instrument (Biogas 5000) the accuracy is 0.94% whereas the MR states an accuracy of 0.5%. Please clarify the difference.</li> <li>EC<sub>PJ,y</sub>: As per techn spec and calibration sheet the accuracy is 1.0 instead of 0.5 as per MR.</li> </ol>				
<b>Project participant response (1<sup>st</sup> round)</b>				



1. Flow meters for flare and engine <ul style="list-style-type: none"> <li>a. The validity periods for the calibration of the flare and engine flow meters have been updated in the attached Monitoring Report to include all calibrations.</li> <li>b. The maximum error of 4% has been applied for the period 2 June 2016 to 23 June 2016 for missed calibration of the E&amp;H flow meters. Calculation sheets have been revised for this.</li> </ul>		
2. The WIKA TR200 unit was changed on 25/02/2016 to an E&H Omnigrad TR10 temperature transmitter (for specification document see response to CL1). This is now stated in the attached Monitoring Report.		
3. The Monitoring Report has been revised to reflect the application of operation procedures.		
4. The accuracy for the handheld instrument (Biogas 5000) is corrected to 0.94% in the attached Monitoring Report.		
5. EC <sub>PJ,y</sub> : corrected to an accuracy of 1.0 in the attached Monitoring Report		
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>		<b>Date:</b> 14/02/2017
<input type="checkbox"/> Changes in the PDD	Section(s):	New version No.:
<input checked="" type="checkbox"/> Changes in MR	Section(s): D.2	New version No.: 2
<input checked="" type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:
<input type="checkbox"/> Other:		
<b>DOE assessment (1<sup>st</sup> round)</b>		<b>Date:</b> 01/03/2017
1. Flow meters for flare and engine <ul style="list-style-type: none"> <li>a. The validity periods have been provided in the MR in line with the latest monitoring plan and calibration certificates.</li> <li>b. DOE has checked the ER spreadsheet and can confirm that the maximum permissible error of 4% has been applied for the period 02/06/2016 to 23/06/2016 for delayed calibration of the E&amp;H flow meters. The calibration conducted on 23/06/2016 did show that the meters work within the permissible range. Calculation sheets have been revised for this.</li> </ul>		
2. In line with information found during site inspection the MR has been updated accordingly to state when the WIKA TR200 has been exchanged with an E+H temp transmitter.		
3. MR has been revised in a way to state that calibration frequency is not defined in line with the latest monitoring plan and und QA/QC that the calibration is carried out as per operational procedures.		
4. The accuracy stated in the MR has been corrected in line with related supporting documents.		
5. The accuracy stated in the MR has been corrected in line with related supporting documents.		
<b>Conclusion</b> Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

<b>CAR ID</b>	04	<b>Section no.</b>	E	<b>Date:</b> 01/02/2017
<b>Description of CAR</b>				
Following issues w.r.t. ER calculation have been identified: The applied transmission loss factor is inconsistent between MR, source and the spreadsheet. MR and spreadsheet refer to 8.88% whereas the source states 8.79% (page 62).				
<b>Project participant response (1<sup>st</sup> round)</b>				
The Monitoring Report references a TDL value of 8.8% and all emission reductions have been calculated using this value. Individual monthly data sheets have been updated to reflect this value throughout the documentation. The Eskom report for 2014/15 (i.e. page 62 of the source) states the figure for 2014/15 as 8.79%. This figure was conservatively rounded up to 8.8% and used in the calculations. At the time of drafting the Monitoring Report the latest Eskom report (2015/16) had not been published. The now published value for this period is 8.59% and therefore the use of 8.8% remains a suitably conservative approach for the monitored period. Eskom information is uploaded to the project file on Dropbox as '170201 CARs – CAR4'.				
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>				<b>Date:</b> 14/02/2017
<input type="checkbox"/> Changes in the PDD	Section(s):		New version No.:	
<input type="checkbox"/> Changes in MR	Section(s):		New version No.:	
<input type="checkbox"/> Changes in XLS	Worksheet(s):		New version No.:	

<input type="checkbox"/> Other:		
<b>DOE assessment (1<sup>st</sup> round)</b>		<b>Date:</b> 01/03/2017
<p>Not ok. The latest source available at time of preparation of MR for publishing provides a value of 8.79%. MR, raw data files and CDM summary spreadsheet (final ER calc spreadsheet) apply now a value of 8.8% which is considered correct due to rounding and is conservative. The value will be annually calculated and provided by ESKOM. The period for which the value is calculated is always from 01/04 to 31/03 next year e.g. 14/15 is 01/04/2014 to 31/03/2015. As the monitoring period starts 01/10/2014 applying value 14/15 was valid until 31/03/2015. The lately published value for 15/16, period 01/04/2015 to 31/03/2016, was lower than 8.8% at 8.59%. PP did not change the value which is conservative as TDL is applied for calculating project emissions. No value for the period after March 2016 is available so only one value for the entire monitoring period is applied. The values have been checked with the related ESKOM reports.</p> <p>However the spreadsheet contains links to external documents e.g. sheet 2014-12 cells E19 to E25 and E34. Please check all subsheets to ensure that no links to external documents are included in final ER spreadsheet.</p>		
<b>Project participant response (2<sup>nd</sup> round)</b>		
CDM summary without link.xls sent		
<b>Documentation provided by project participant (2<sup>nd</sup> round)</b>		<b>Date:</b> DD/MM/2017
<input type="checkbox"/> Changes in the PDD	Section(s):	New version No.:
<input type="checkbox"/> Changes in MR	Section(s):	New version No.:
<input checked="" type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:
<input type="checkbox"/> Other:		
<b>DOE assessment (2<sup>nd</sup> round)</b>		<b>Date:</b> DD/03/2017
Ok. Updated excel spreadsheet without links has been provided.		
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed	

<b>CAR ID</b>	05	<b>Section no.</b>		<b>Date:</b> 01/02/2017
<b>Description of CAR</b>				
Following documents to be provided: <ol style="list-style-type: none"> <li>1. Monthly gas well operation reports for the monitoring period</li> <li>2. Compliance report</li> </ol>				
<b>Project participant response (1<sup>st</sup> round)</b>				
The following documents are uploaded to the project file on Dropbox as '170201 CARs – CAR5' <ol style="list-style-type: none"> <li>1. Operational reports for 2014 and 2015;</li> <li>2. External audit compliance reports for July 2015, January 2016 and September 2016.</li> </ol>				
<b>Documentation provided by project participant (1<sup>st</sup> round)</b>				<b>Date:</b> 14/02/2017
<input type="checkbox"/> Changes in the PDD	Section(s):	New version No.:		
<input type="checkbox"/> Changes in MR	Section(s):	New version No.:		
<input type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:		
<input type="checkbox"/> Other:				
<b>DOE assessment (1<sup>st</sup> round)</b>				<b>Date:</b> 01/03/2017
<ol style="list-style-type: none"> <li>1. All operational reports for this monitoring period have been provided.</li> <li>2. All three compliance reports have been provided. The reports do not show an significant issue related to the CDM project activity.</li> </ol>				
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

Table 6. FAR from this verification

<b>FAR ID</b>	-	<b>Section No.</b>		<b>Date:</b> DD/MM/YYYY
<b>Description of FAR</b>				

<i>n.a.</i>		
<b>Project participant response</b>		<b>Date:</b> DD/MM/YYYY
<b>Documentation provided by project participant</b>		
<input type="checkbox"/> Changes in the PDD	Section(s):	New version No.:
<input type="checkbox"/> Changes in MR	Section(s):	New version No.:
<input type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:
<input type="checkbox"/> Other:		
<b>DOE assessment</b>		<b>Date:</b> DD/MM/YYYY
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>		
<input type="checkbox"/> To be checked during the next periodic verification		

# Appendix 5. Monitored Parameters

**Table A-5:** Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>A. <math>V_{LFG, total, y, db}</math></b>		<b>Volumetric flow of total landfill gas which is sent to flare and used for electricity generation in year y on a dry basis</b>		
<p><b>a) Measurement / Determination method (VVS, §§ 389-393)</b>  Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).  Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.  Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	<p>/IM01/  /PDD/  /ACM1/  /TS/  /IM01/</p>	<p><i>Description:</i> The Volumetric flow of total landfill gas is monitored by flow meters. The total flow is determined by adding the two measured flows going to the flare and the engine. Until 02/06/2015 the two flow meters are of type Kurz Instruments serial number: FD20272A and FD20273A. Since then E+H Proline t-mass 65i flowmeters are installed serial number: K3047D02000 and K3047E02000.</p> <p>The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By check of MR, reg PDD as well as onsite visit and technical data sheet as well as interview with CDM operator.</p> <p><i>Conclusion:</i> CL 01, CL 02 and CAR 03 have been raised.</p>	<p>CL01  CL02  CAR  03</p>	<p>OK</p>
<b>b) Accuracy and QA/QC Procedure</b>	/CAL/	<p><i>Description:</i> The accuracy of the Kurz flow meters is</p>	CL01	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><b>(VVS, §§ 394-400)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	<p>/MM/ /MR/</p>	<p>±2%+20SFPM those of the E+H is ±4%. The Kurz meters have been calibrated on 21/10/2014 with a validity of one year ending 20/10/2015. The calibration of the flow meters installed has been conducted by SGS onsite.</p> <p>The E+H flow meters have been calibrated on 11/03/2015, 02/06/2015 and 23/06/2016. The calibration showed that the meter is working within the accuracy limits.</p> <p>Based on that there is a delay in calibration from 02/06/2016 to 23/06/2016. The PP has already by himself applied the related regulations VVS §395 in a conservative (lower ER result) manner.</p> <p>Besides the flow meter is periodically calibrated against a primary device provided by an independent accredited laboratory is mandatory. Calibration and frequency of calibration is according to manufacturer's specifications, but at least every 2 years.</p> <p>A primary device has been used to conduct the onsite calibration. The used equipment for the calibration has been duly calibrated as indicated by related certificates attached to the SGS report.</p> <p><i>Verifier's action:</i> By means of checking calibration certificates, interview with CDM operator, reg PDD as well as MR.</p> <p><i>Conclusion:</i> The reported error is 3.6% for FD 20273A and 3.1% for FD 20272A by SGS done on 21/10/2014. As the accuracy of the Kurz meter is 2% PP voluntarily deducted 3.6% and 3.1% to account for the result of the SGS calibration result showing an error outside the accuracy of the meter. This is considered reasonable and conservative. Due to this the Kurz meter has been also exchanged to a E+H meter. The application of maximum permissible error for the delayed calibration of 4% for the E+H meter has been correctly and conservatively considered in the ER calculation spreadsheet in line with the requirements. The delayed calibration showed that the meter is operating within permissible limits. However CL 01, CL 02 and</p>	<p>CL 02 CAR 03</p>	

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		CAR 03 have been raised.		
<p><b>c) Correctness</b> (VVS, §§ 389-393)</p> <p>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</p>	/MR/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value is directly taken by the digital operation system from which the value is included in the CDM Data spreadsheet for ER calculation.</p> <p><i>Verifier's action:</i> The CDM Data spreadsheet has been checked against the daily site record sheet and monthly meeting minutes as well as monthly operational reports by the CDM operator.</p> <p><i>Conclusion:</i> No inconsistencies or implausible values have been identified. However CL 02 has been raised w.r.t. calibration of the equipment.</p>	CL-02	OK
<b>B. V<sub>LFG,sent flare,y,db</sub></b>		<b>Volumetric flow of landfill gas which is sent to flare in year y on a dry basis</b>		
<p><b>a) Measurement / Determination method</b> (VVS, §§ 389-393)</p> <p>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/IM01/ /PDD/ /ACM1/	<p><i>Description:</i> The Volumetric flow of the landfill gas to the flare is monitored by a flow meter. Until 02/06/2015 the flow meter is of type Kurz Instruments serial number: FD20272A. Since then E+H Proline t-mass 65i flowmeter is installed serial number: K3047D02000.</p> <p>The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p>	CL01 CL-02 CAR 03	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p><i>Verifier's action:</i> By check of MR, reg PDD as well as onsite visit and technical data sheet as well as interview with CDM operator.</p> <p><i>Conclusion:</i> CL 01, CL 02 and CAR 03 have been raised.</p>		
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	<p>/CAL/ /MM/ /MR/ /PDD/ /TS/</p>	<p><i>Description:</i> The accuracy of the Kurz flow meter is <math>\pm 2\% + 20 \text{ SFPM}</math> those of the E+H is <math>\pm 4\%</math>. The Kurz meter has been calibrated on 21/10/2014 with a validity of one year ending 20/10/2015. The calibration of the flow meters installed has been conducted by SGS onsite.</p> <p>The E+H flow meter have been calibrated on 11/03/2015, 02/06/2015 and 23/06/2016. The calibration showed that the meter is working within the accuracy limits.</p> <p>Based on that there is a delay in calibration from 02/06/2016 to 23/06/2016. The PP has already by himself applied the related regulations VVS §395 in a conservative (lower ER result) manner.</p> <p>Besides the flow meter is periodically calibrated against a primary device provided by an independent accredited laboratory is mandatory. Calibration and frequency of calibration is according to manufacturer's specifications, but at least every 2 years.</p> <p>A primary device has been used to conduct the onsite calibration. The used equipment for the calibration has been duly calibrated as indicated by related certificates attached to the SGS report.</p> <p><i>Verifier's action:</i> By means of checking calibration certificates, interview with CDM operator, reg PDD as well as MR.</p> <p><i>Conclusion:</i> The reported error is 3.1% for FD 20272A by SGS done on 21/10/2014. As the accuracy of the Kurz meter is 2% PP voluntarily deducted 3.1% to account for the result of the SGS calibration result shoing an error outside the accuracy of the meter. This is considered reasonable and conservative. Due</p>	<p>CL01 CL02 CAR 03</p>	<p>OK</p>

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		to this the Kurz meter has been also exchanged to a E+H meter. The application of maximum permissible error for the delayed calibration of 4% for the E+H meter has been correctly and conservatively considered in the ER calculation spreadsheet in line with the requirements. The delayed calibration showed that the meter is operating within permissible limits. However CL 01, CL 02 and CAR 03 have been raised.		
<p><b>c) Correctness</b> <b>(VVS, §§ 389-393)</b> Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</p>	/MR/	<p><input checked="" type="checkbox"/> Correct      <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value is directly taken by the digital operation system from which the value is included in the CDM Data spreadsheet for ER calculation.</p> <p><i>Verifier's action:</i> The CDM Data spreadsheet has been checked against the daily site record sheet and monthly meeting minutes as well as monthly operational reports by the CDM operator.</p> <p><i>Conclusion:</i> No inconsistencies or implausible values have been identified. However CL 02 has been raised w.r.t. calibration of the equipment.</p>	CL-02	OK
<b>C. V<sub>LFG,EL,y,db</sub></b>		<b>Volumetric flow of landfill gas which is used for electricity generation in year y on a dry basis</b>		
<p><b>a) Measurement / Determination method</b> <b>(VVS, §§ 389-393)</b> Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/IM01/ /PDD/ /ACM1/	<p><i>Description:</i> The Volumetric flow of the landfill gas to the engine is monitored by flow meter. Until 02/06/2015 the flow meter is of type Kurz Instruments serial number: FD20273A. Since then E+H Proline t-mass 65i flowmeters are installed serial number: K3047E02000.</p> <p>The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager.</p>	CL01 CL-02 CAR 03	OK



<b>Checklist Item</b> (incl. guidance for the verification team)	<b>Reference</b>	<b>Verification Team Comments</b> (Means and results of assessment)	<b>Draft Concl.</b>	<b>Final Concl.</b>
		<p>Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By check of MR, reg PDD as well as onsite visit and technical data sheet as well as interview with CDM operator.</p> <p><i>Conclusion:</i> CL 01, CL 02 and CAR 03 have been raised.</p>		
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	<p>/CAL/ /MM/</p>	<p><i>Description:</i> The accuracy of the Kurz flow meter is <math>\pm 2\% + 20 \text{ SFPM}</math> those of the E+H is <math>\pm 4\%</math>. The Kurz meter has been calibrated on 21/10/2014 with a validity of one year ending 20/10/2015. The calibration of the flow meter installed has been conducted by SGS onsite.</p> <p>The E+H flow meter has been calibrated on 11/03/2015, 02/06/2015 and 23/06/2016. The calibration showed that the meter is working within the accuracy limits.</p> <p>Based on that there is a delay in calibration from 02/06/2016 to 23/06/2016. The PP has already by himself applied the related regulations VVS §395 in a conservative (lower ER result) manner.</p> <p>Besides the flow meter is periodically calibrated against a primary device provided by an independent accredited laboratory is mandatory. Calibration and frequency of calibration is according to manufacturer's specifications, but at least every 2 years.</p> <p>A primary device has been used to conduct the onsite calibration. The used equipment for the calibration has been duly calibrated as indicated by related certificates attached to the SGS report.</p> <p><i>Verifier's action:</i> By means of checking calibration certificates,</p>	<p>CL01 CL 02 CAR 03</p>	<p>OK</p>

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		interview with CDM operator, reg PDD as well as MR. <i>Conclusion:</i> The reported error is 3.6% for FD 20273A by SGS done on 21/10/2014. As the accuracy of the Kurz meter is 2% PP voluntarily deducted 3.6% to account for the result of the SGS calibration result shoing an error outside the accuracy of the meter. This is considered reasonable and conservative. Due to this the Kurz meter has been also exchanged to a E+H meter. The application of maximum permissible error for the delayed calibration of 4% for the E+H meter has been correctly and conservatively considered in the ER calculation spreadsheet in line with the requirements. The delayed calibration showed that the meter is operating within permissible limits. However CL 01, CL 02 and CAR 03 have been raised.		
<b>c) Correctness</b> <b>(VVS, §§ 389-393)</b> <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> The value is directly taken by the digital operation system from which the value is included in the CDM Data spreadsheet for ER calculation. <i>Verifier's action:</i> The CDM Data spreadsheet has been checked against the daily site record sheet and monthly meeting minutes as well as monthly operational reports by the CDM operator. <i>Conclusion:</i> No inconsistencies or implausible values have been identified. However CL 02 has been raised w.r.t. calibration of the equipment.	CL-02	OK
<b>D. T<sub>t</sub></b>		<b>Temperature of the gaseous stream in time interval t</b>		
<b>a) Measurement / Determination method</b> <b>(VVS, §§ 389-393)</b> <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used.</i>	/IM01/ /PDD/ /MR/ /TS/ /ACM1/	<i>Description:</i> The temperature is monitored by temperature transmitter WIKA TR200 Serial Number: 46002570 until 25/02/2016 and thereafter by E+H Omnigrad TR 10 serial number: L203E994152. The temperature transmitter is located at the same position as the related flow meter. The value of the equipment is forwarded to a digital control	CL-04 CAR 03	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p>system were the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By check of MR, reg PDD as well as onsite visit and technical data sheet.</p> <p><i>Conclusion:</i> However CL 01 and CAR 03 have been raised.</p>		
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	<p>/CAL/ /MM/ /MR/ /PDD/ /CAL/</p>	<p><i>Description:</i> The accuracy of the installed temperature transmitter is 0.8°C max for WIKA and 0.35°C max for E+H over the full scale.</p> <p><i>Verifier's action:</i> By means of MR, reg PDD as well as related tools and methodology as well as calibration certificates.</p> <p><i>Conclusion:</i> CL 01 and CAR 03 have been raised.</p>	CL-01 CAR 03	OK
<p><b>c) Correctness (VVS, §§ 389-393)</b></p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p>	<p>/MR/ /XLS/</p>	<p><input checked="" type="checkbox"/> Correct      <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value is directly taken by the digital operation system from which the value is included in the CDM Data spreadsheet for ER calculation.</p>	Ok	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>		<i>Verifier's action:</i> The CDM Data spreadsheet has been checked against the daily site record sheet and monthly meeting minutes. <i>Conclusion:</i> No inconsistencies or implausible values have been identified. Further all temperature values confirm that Option A (b) as per tool to determine the mass flow of gaseous streams is still valid. All temperature values are below the 60 °C threshold.		
<b>E. P<sub>t</sub></b>		<b>Pressure of the gaseous stream in time interval t</b>		
<p><b>a) Measurement / Determination method (VVS, §§ 389-393)</b>  <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).  Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.  Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/IM01/ /PDD/ /ACM1/	<p><i>Description:</i> The pressure of the gaseous stream is monitored by pressure transmitter GE Sensing Druck PTX 7900-3399 Serial Number: 2345399 (since 01/10/2014) and since 17/05/2016 monitored by the SN 2765987. The pressure transmitter is located at the same position as the related flow meter.</p> <p>The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By check of MR, reg. PDD as well as onsite visit and technical data sheet.</p> <p><i>Conclusion:</i> However CAR 03 has been raised.</p>	CAR 03	OK
<b>b) Accuracy and QA/QC Procedure</b>	/CAL/	<i>Description:</i> The accuracy of the installed pressure transmitter is	CAR	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>(VVS, §§ 394-400)</b> <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i>	/MM/	<p>±0.25% over the full scale. Further as per letter by the equipment provider there is no specific calibration interval by the manufacturer. Therefore the calibration frequency stated in MR with N/A is reasonable and plausible.</p> <p>As per Appendix 6 there is a delay in calibration from start of this monitoring period 01/10/2014 until 13/05/2015 date of calibration and 13/05/2016 until 17/05/2016 when new equipment was installed. Based on that and in accordance with VVS §395 maximum permissible error has been applied. As the delayed calibration showed an accuracy of 0.687% this value has been applied as the regular accuracy would be better with 0.25% for the period until 13/05/2015. For the period ending 17/05/2016 the maximum permissible error of 0.25% has been conservatively applied as the new equipment installed is factory calibrated.</p> <p><i>Verifier's action:</i> By means of MR, reg PDD as well as related tools and methodology as well as calibration certificates.</p> <p><i>Conclusion:</i> However CAR 03 has been raised.</p>	03	
<b>c) Correctness (VVS, §§ 389-393)</b> <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /XLS/	<p><input checked="" type="checkbox"/> Correct      <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value is directly taken by the digital operation system from which the value is included in the CDM Data spreadsheet for ER calculation.</p> <p><i>Verifier's action:</i> The CDM Data spreadsheet has been checked against the daily site record sheet and monthly meeting minutes.</p> <p><i>Conclusion:</i> No inconsistencies or implausible values have been identified.</p>	OK	OK
<b>F. <math>p_{H_2O,t,Sat}</math></b>		<b>Saturation pressure of H<sub>2</sub>O at temperature T<sub>t</sub> in time interval t</b>		
<b>a) Measurement / Determination method (VVS, §§ 389-393)</b> <i>Describe how the monitoring parameter was measured /</i>	/IM01/ /PDD/ /ACM1/	<p><i>Description:</i> The saturation pressure of the temperature T<sub>t</sub> is determined from literature as it is solely a function of the gaseous stream temp. T<sub>t</sub> for a total pressure equal to 101,325</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/MR/ /XLS/	<p>Pa.</p> <p>The saturation pressure is only required in case the gas temperature increases above 60°C to determine the moisture content in the gas stream to calculate gas on dry basis.</p> <p>The CDM data is checked if the temp is above or below 60°C. If Tt &gt;60°C the saturation pressure is determined according to the related literature.</p> <p>Please refer to the related parameter Tt on this is monitored.</p> <p><i>Verifier's action:</i> By check of MR, reg. PDD as well as onsite visit and technical data sheet.</p> <p><i>Conclusion:</i> DOE checked PDD and also by interview with PP and personnel on the monitoring of the value. Based on that DOE is of the opinion that the PP is aware of the procedure and determination method. As during this entire monitoring period the gas temperature did not exceed the threshold of 60°C it was not necessary to monitor this parameter. And hence ok.</p>		
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	/CAL/ /MM/	<p><i>Description:</i> No measurement equipment is involved as the value is determined from literature source.</p> <p><i>Verifier's action:</i> By means of MR, reg PDD as well as related source document.</p> <p><i>Conclusion:</i> ok.</p>	OK	OK
<p><b>c) Correctness (VVS, §§ 389-393)</b></p> <p><i>Determine whether the value given in the monitoring report</i></p>	/MR/ /XLS/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The saturation pressure of the temperature Tt is determined from literature as it is solely a function of the</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>		gaseous stream temp. Tt for a total pressure equal to 101,325 Pa.  <i>Verifier's action:</i> The CDM Data spreadsheet has been checked against the daily site record sheet and monthly meeting minutes. <i>Conclusion:</i> As the gas temp did not exceed the 60°C level it was not required to monitor or determine this parameter during this entire monitoring period. Hence ok.		
<b>G. <math>v_{CH4,t,db}</math></b>		<b>Volumetric fraction of CH4 in a time interval t on a dry basis</b>		
<p><b>a) Measurement / Determination method (VVS, §§ 389-393)</b>  Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).  Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.  Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/IM01/ /PDD/ /ACM1/	<p><i>Description:</i> The volumetric fraction of CH4 in a time interval t on a dry basis is monitored by CH4 measurement equipment type Edinburgh Instruments, Gascard NG, serial number: 2309 (until 10/10/2014), 5147 (until 05/02/2015) and 6855 since then. The Gascard #2309 has been installed on 19/12/2013 and operated until 10/10/2014. From 10/10/2014 to 05/02/2015 Gascard has been exchanged with serial number #5147 and again from 05/02/2015 with #6855 which operates since then.</p> <p>The Gascard NG is located between the booster and the flare.</p> <p>Besides that the CDM operator uses a handheld gas analyzer of type Biogas 5000 from Geotech serial number G500625. The handheld analyzer is used to check the methane quality at each well on a monthly basis and more frequent for new wells. This is done to operate the wells in a way to have a constant flow of constant methane content.</p> <p>The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR</p>	CAR 03	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By onsite visit, interview with CDM operator, check of notes in CDM data spreadsheet as well as reg PDD, MR and supporting documents.</p> <p><i>Conclusion:</i> CAR 03 has been raised.</p>		
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	/CAL/ /MM/	<p><i>Description:</i> The accuracy of the installed pressure transmitter is <math>\pm 2\%</math> over the range.</p> <p>The Gascard NG is calibrated when delivered by the manufacturer. Please refer to Appendix 6 w.r.t. related calibration dates. The manufacturer their manual chapter 10 that the "sensor is inherently stable and will maintain its calibration over extended periods with minimal maintenance. We recommend that the calibration is checked every 12 months. Any adjustment required should be small." Further as per manufacturer manual the following conditions apply for the calibration check:</p> <ul style="list-style-type: none"> <li>• a zero calibration has to be conducted before a calibration against calibration gas and</li> <li>• the concentration of the calibration gas should be between 80% to 100% of either CO<sub>2</sub>, CH<sub>4</sub> or CO and</li> <li>• the accuracy of the calibration gas should be of <math>\pm 2\%</math> or better</li> </ul> <p>However as per letter by the manufacturer as the CH<sub>4</sub> content of the LFG is always around 52% it is also in line to use calibration gas representing their operation conditions. This might lead to a minimal higher inaccuracy at the top end of the range (100%) but as the CH<sub>4</sub> content never went beyond 60% this has no influence at all. Thereafter the Gascard NG has been</p>	CAR 03	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>calibrated against calibration gas on 14/08/2014, 16/10/2014, 15/12/2014, 07/01/2015, 11/02/2015, 06/03/2015, 25/05/2015, 10/07/2015, 28/01/2016, 15/02/2016, 11/04/2016, 27/05/2016, 07/06/2016, 11/08/2016.</p> <p>Further the accuracy of the Edinburgh Instrument Gascard NG has been checked against a handheld analyzer Biogas 5000, serial number: G500625, accuracy class <math>\pm 0.94\%</math> of methane content. The Biogas 5000 analyzer has been calibrated on 15/01/2014, 02/02/2015 and 05/02/2016 by the manufacturer with a validity of one year each ending 14/01/2015, 01/02/2016 and 04/02/2017 respectively.</p> <p>The related calibration gas used have a corresponding certificate the validity of the gases used is 19/01/2014 until 19/01/2015, 12/02/2015 to 12/02/2016 and 10/03/2016 to 10/03/2017.</p> <p>In case of failure of the stationary analyzer the handheld analyzer will be used until the failure is cleared and the stationary analyzer is working well again.</p> <p><i>Verifier's action:</i> By means of MR, reg PDD as well as related tools and methodology as well as calibration certificates and sheets.</p> <p><i>Conclusion:</i> Based on the above the Gascard NG monitoring equipment has been duly calibrated for this entire monitoring period as each field calibration would be valid for 12 months and it is done almost on monthly basis. The Biogas handheld shows delays in calibration for the periods 15/01/2015 – 02/02/2015 and 02/02/2016 – 05/02/2016. However during these periods no crosscheck calibration has been conducted with the manual device and it has not direct influence on the ER calculation as it is used to crosscheck the Gascard NG analyzer. Therefore it is deemed reasonable and plausible that no conservative adjustment to the ER calculation has been conducted. However CAR 03 has been raised.</p>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>c) Correctness</b> <b>(VVS, §§ 389-393)</b> <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /XLS/ /DPR/ /DSR/ /DAT/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> The value is directly taken by the digital operation system from which the value is included in the CDM Data spreadsheet for ER calculation. <i>Verifier's action:</i> The CDM Data spreadsheet has been checked against the daily site record sheet and monthly meeting minutes. <i>Conclusion:</i> No inconsistencies or implausible values have been identified.	OK	OK
<b>H. EG<sub>PJ,y</sub></b>		<b>Amount of electricity generated using LFG</b>		
<b>a) Measurement / Determination method</b> <b>(VVS, §§ 389-393)</b> <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM01/ /PDD/ /ACM1/ /XLS/ /MR/ /PDD/	<i>Description:</i> The amount of electricity generated using LFG via the installed gas engine is monitored by an electricity meter of type Landis+Gyr, Serial Number: 86342181 (until 18/03/2016) and 50873189 since then for the main meter. Besides back-up meter is installed of the same type Serial Number: 95680700 (until 09/03/2016) and 50873185 since then. The meter is a bi-directional meter measuring output and input electricity.  The value for the amount of electricity generated is taken by a person from the meter section (department) every month online digital from the meter. The raw data is processed and the person from the meter section summarizes the input and output values for peak, standard time and off-peak periods in a pdf file. The pdf-file is forwarded to the related electricity engineer from the eThekweni (Durban) municipality. The eThekweni engineer inserts the values from the pdf file into an Excel template to calculate the related peak, standard and off-peak period kWh values and the amount in Rand respectively. In the Excel file the net generation is calculated by subtracting the input electricity from the output generated electricity by the project activity. Then the monthly spreadsheet is forwarded to the CDM operator (Envitech) an employee of the CDM operator inserts the respectively monthly value in their CDM Data spreadsheet. The CDM data spreadsheet is then forwarded to the PP (DSW)	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>which again forwards the files to the Quality assurance/CDM Consultant who prepares the monitoring report.</p> <p><i>Verifier's action:</i> Onsite observation, interview with personnel, technical data sheet as well as MR and registered PDD. Checked the monthly Excel template against all monthly pdf files as well as the values inserted into the CDM Data spreadsheet.</p> <p><i>Conclusion:</i> No mistakes have been identified by transferring the data. Further as the above stated data aggregation and processing is laid down in related manuals e.g. step-by-step methodology DOE considers the measuring and monitoring of the value as in compliance with the monitoring plan.</p>		
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	<p>/CAL/ /MM/ /STAND/ /PDD/</p>	<p><i>Description:</i> The accuracy of the installed meter is 0.50%. The calibration frequency is stated in MR with every 10 years.</p> <p>The main meter has been calibrated on 22/03/2006 and is valid until 21/03/2016 and the new meter on 18/06/2014 valid until 17/06/2024.</p> <p>The back-up meter has been calibrated on 12/11/2008 and is valid until 11/11/2018 and the new meter on 18/06/2014 valid until 17/06/2024.</p> <p><i>Verifier's action:</i> By check of MR, calibration certificates as well as reg PDD and related standard</p> <p><i>Conclusion:</i> DOE has checked registered PDD and related South African Nation Standard (SANS) and can confirm that the standard requires a calibration frequency of every 10 years for project up to 10 MVA load.</p> <p>The meter has been duly calibrated for this entire monitoring period.</p>	OK	OK
<p><b>c) Correctness (VVS, §§ 389-393)</b></p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p>	<p>/MR/ /PDD/ /XLS/ /IM01/</p>	<p><input checked="" type="checkbox"/> Correct      <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value for the amount of electricity generated is taken by a person from the meter section (department) every month online digital from the meter. The raw data is processed</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/ELEB/ /ELER/ /DSR/	and the person from the meter section summarizes the input and output values for peak, standard time and off-peak periods in a pdf file. The pdf-file is forwarded to the related electricity engineer from the eThekweni (Durban) municipality  <i>Verifier's action:</i> By means of checking MR, reg PDD, data from spreadsheet CDM Data besides monthly elec billing spreadsheet, elec reading by metering dept. and calculation method and check of digital control system during onsite visit. <i>Conclusion:</i> No mistake has been identified.		
<b>I. EC<sub>PJ,y</sub></b>		<b>Quantity of electricity consumed by the project activity during the year y</b>		
<b>a) Measurement / Determination method (VVS, §§ 389-393)</b> <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM01/ /PDD/ /ACM1/	<i>Description:</i> The quantity of electricity consumed by the project activity is monitored by an electricity meter of type Landis+Gyr, Serial Number: 85066208 (until 19/08/2015) and 50710474 since then.  The value for the amount of electricity consumed is taken by a person from the meter section (department) every month online and digitally from the meter. The raw data is processed and the person from the meter section summarizes the input and output values for peak, standard time and off-peak periods in a pdf file. The pdf file is forwarded to the related electricity engineer from the eThekweni (Durban) municipality. The eThekweni engineer inserts the values from the pdf file into an Excel template to calculate the related peak, standard and off-peak period kWh values and the amount in Rand respectively. In the Excel file the net generation is calculated by subtracting the input electricity from the output generated electricity by the project activity. Then the monthly spreadsheet is forwarded to the CDM operator (Envitech) an employee of the CDM operator inserts the respectively monthly value in their CDM Data spreadsheet. The CDM data spreadsheet is then forwarded to the PP (DSW) which again forwards the files to the Quality assurance/CDM Consultant who prepares the monitoring report.	CAR 03	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p><i>Verifier's action:</i> Onsite observation, interview with personnel, technical data sheet as well as MR and registered PDD.</p> <p><i>Conclusion:</i> CAR 03 has been raised.</p>		
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	/CAL/ /MM/	<p><i>Description:</i> The accuracy of the installed meter is 1.0%. The calibration frequency is stated in MR with every 10 years.</p> <p>The meter has been calibrated on 26/08/2005 and is valid until 25/08/2015 and the new meter on 17/06/2014 valid until 16/06/2024.</p> <p><i>Verifier's action:</i> By check of MR, calibration certificates as well as reg PDD and related standard</p> <p><i>Conclusion:</i> DOE has checked registered PDD and related South African Nation Standard (SANS) and can confirm that the standard requires a calibration frequency of every 10 years for project up to 10 MVA load.</p> <p>The meter has been duly calibrated for this entire monitoring period.</p> <p>However CAR 03 has been raised.</p>	CAR 03	OK
<p><b>c) Correctness (VVS, §§ 389-393)</b></p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/MR/ /PDD/ /XLS/ /IM01/ /ELEB/ /ELER/ /DSR/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value for the amount of electricity generated is taken by a person from the meter section (department) every month online digital from the meter. The raw data is processed and the person from the meter section summarizes the input and output values for peak, standard time and off-peak periods in a pdf file. The pdf-file is forwarded to the related electricity engineer from the eThekwin (Durban) municipality</p> <p><i>Verifier's action:</i> By means of checking MR, reg PDD, data from spreadsheet CDM Data besides monthly elec billing spreadsheet, elec reading by metering dept. and calculation method and check of digital control system during onsite visit.</p> <p><i>Conclusion:</i> No mistake has been identified.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>J. Op<sub>engine,h</sub></b>		<b>Operation of the engine that consumes the LFG</b>		
<p><b>a) Measurement / Determination method (VVS, §§ 389-393)</b>  Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).  Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.  Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	<p>/IM01/  /PDD/  /ACM1/  /MR/</p>	<p><i>Description:</i> The Operation of the engine that consumes the LFG is monitored via electricity meters as described above for parameter <b>EG<sub>PJ,y</sub></b>. The control box of the engine further sends a signal to the connected PLC.</p> <p>The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> by means of checking MR, reg PDD, methodology, tools as well as monthly meeting minutes, onsite visit and interviews conducted.</p> <p><i>Conclusion:</i> No mistakes have been identified by transferring the data. Further as the above stated data aggregation and processing is laid down in related manuals e.g. step-by-step methodology DOE considers the measuring and monitoring of the value as in compliance with the monitoring plan.</p>	OK	OK
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b>  In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if</p>	<p>/CAL/  /MM/</p>	<p><i>Description:</i> The Operation of the engine that consumes the LFG is monitored via an electricity meters as described above for parameter <b>EG<sub>PJ,y</sub></b>.</p> <p>For further details please refer to checklist item H. <b>EG<sub>PJ,y</sub></b> b).</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>		<p><i>Verifier's action:</i> By check of MR, calibration certificates as well as reg PDD and related standard</p> <p><i>Conclusion:</i> No mistakes have been identified. The meters have been duly calibrated for this entire monitoring period.</p>		
<p><b>c) Correctness</b> <b>(VVS, §§ 389-393)</b></p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	<p>/MR/ /IM01/ /XLS/</p>	<p><input checked="" type="checkbox"/> Correct      <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value is determined by electricity meter as stated under a). The related digital control system records a value of 1 when the engine is operating and zero if not. This is done on minute basis.</p> <p><i>Verifier's action:</i> By means of checking raw data, digital control system, interview with related personnel as well ER spreadsheet and MR.</p> <p><i>Conclusion:</i> The value has been monitored correct and ER spreadsheet has correctly reflected the value.</p>	OK	OK
<b>K. Op<sub>flare,h</sub></b>		<b>Operation of the flare that consumes the LFG</b>		
<p><b>a) Measurement / Determination method</b> <b>(VVS, §§ 389-393)</b></p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /ACM1/ /MR/ /REC/ /XLS/ /DPR/ /MCL/</p>	<p><i>Description:</i> The operation hours of the flare can be determined by following criterion:</p> <p>Op<sub>flare,h</sub> = 0 when:</p> <ul style="list-style-type: none"> <li>• Flame is not detected continuously in hour h (instantaneous measurements are made at least every minute);</li> </ul> <p>Otherwise, Op<sub>flare,h</sub> = 1</p> <p>This is based on a thermocouple which monitors the flame temperature and SCADA system recognizes the temperature. The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban</p>	OK	OK

<b>Checklist Item</b> (incl. guidance for the verification team)	<b>Reference</b>	<b>Verification Team Comments</b> (Means and results of assessment)	<b>Draft Concl.</b>	<b>Final Concl.</b>
		<p>and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p>Besides the parameter could also be monitored via the flame detector installed.</p> <p><i>Verifier's action:</i> By means of checking MR, reg PDD, methodology, tools as well as monthly meeting minutes, onsite visit and interviews conducted.</p> <p><i>Conclusion:</i> The monitoring of the parameter is in line with the latest monitoring plan as well as methodology and tools.</p>		
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b>  <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i>  <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i>  <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	<p>/MR/  /PDD/  /IM01/  /DAT/</p>	<p><i>Description:</i> The accuracy class of the thermocouples is 0.75%. The meters have been calibrated on 29/11/2013 and is valid for 3 years. Further the thermocouple will be exchanged on an annual basis and the new thermocouple is calibrated at the manufacturer before delivery. No further QA/QC procedure is required.</p> <p>Replacements took place on 15/12/2014 and 15/12/2015 during the monitoring period, with the following thermocouples being used:</p> <ol style="list-style-type: none"> <li>1. 3397085 – 17/12/2013 to 15/12/2014</li> <li>2. 3397087 – 15/12/2014 to 15/12/2015</li> <li>3. 3397086 – 15/12/2015 to 30/09/2016</li> </ol> <p><i>Verifier's action:</i> By means of checking MR, calibration certificate as well as technical data sheet and site records.</p>	<p>OK</p>	<p>OK</p>



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<i>Conclusion:</i> Due to the above the monitoring equipment has been duly calibrated for the entire monitoring period.		
<b>c) Correctness (VVS, §§ 389-393)</b> <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.  In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.  In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/ MR/ / XLS/ / REC/ / DSR/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> Even though the operation of the flare could be determined by two means during this monitoring period the operation of the flare has been determined via the installed and mentioned thermocouples. <i>Verifier's action:</i> By means of checking raw data, digital control system, monthly minutes, interview with related personnel as well ER spreadsheet and MR. <i>Conclusion:</i> The value has been correctly monitored and reported.	OK	OK
<b>L. Flame<sub>m</sub></b>		<b>Flame detection of flare in the minute m</b>		
<b>a) Measurement / Determination method (VVS, §§ 389-393)</b> <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DALO)).  Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.  Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/ IM01/ / PDD/ / ACM1/ / TA/ / TS/	<i>Description:</i> Whether the flame in the flare is on or off is identified via an installed flame detector. The flame detector is an infrared camera which gives a zero signal when no flame is identified and a 1 when a flame is detected. The value is used to determine whether the flare is on or off and is used to determine the related flare efficiency. The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation. Besides the above, monthly meetings are held to discuss the	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> by means of checking MR, reg PDD, interview with personnel, onsite visit and document check.</p> <p><i>Conclusion:</i> The parameter has been monitored in line with the methodology, tool and latest monitoring plan.</p>		
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	<p>/MR/ /PDD/ /IM01/ /TS/ /DAT/</p>	<p><i>Description:</i> The equipment used us an infrared camera for the flare detection. The camera has no accuracy.</p> <p><i>Verifier's action:</i> By means of checking MR, reg PDD and interview with personnel, technical specification and site record sheets.</p> <p><i>Conclusion:</i> As per manufacturer recommendation the equipment does not require calibration but has to be exchanged approx. After 10,000 operation hours and for safety reasons. Therefore detector has been exchanged on 25/03/2015 and again 21/07/2016.</p>	OK	OK
<p><b>c) Correctness (VVS, §§ 389-393)</b></p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	<p>/MR/ /XLS/ /DSR/ /IM01/</p>	<p><input checked="" type="checkbox"/> Correct      <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The flame detector is an infrared camera which gives a zero signal when no flame is identified and a "1" when a flame is detected. The value is used to determine whether the flare is on or off and is used to determine the related flare efficiency. The value of the equipment is forwarded to a digital control system were the value is recorded every minute.</p> <p><i>Verifier's action:</i> By means of checking raw data given in CDM data spreadsheet against MR and onsite visit against the digital control system.</p> <p><i>Conclusion:</i> As per check the values can be confirmed as correct.</p>	OK	OK
<b>M. T<sub>EG,m</sub></b>		<b>Temperature in the exhaust gas of the enclosed flare in</b>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		minute m		
<p><b>a) Measurement / Determination method (VVS, §§ 389-393)</b></p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/IM01/ /PDD/ /ACM1/	<p><i>Description:</i> The temperature of the exhaust gas is monitored by a thermocouple of type "Type N Thermocouple Probe" serial number 3397084, 3397089 and 3397088.</p> <p>The value of the equipment is forwarded to a digital control system where the value is recorded every minute. The digital control system stores and records every minute value by software "Historian". On monthly basis the data is backed-up onsite on a hard drive and on server in Envitech office in Durban and raw data is downloaded. The downloaded information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By means of checking the ER spreadsheet, monthly CDM data spreadsheet, interview with related personnel, onsite observations, technical data sheet, reg PDD, MR.</p> <p><i>Conclusion:</i> The value is monitored as per registered PDD.</p>	OK	OK
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring</i></p>	/CAL/ /MR/ /TS/ /DAT/	<p><i>Description:</i> The accuracy class of the thermocouples is 0.75%. The meters have been calibrated on 29/11/2013 and is valid for 3 years. Further the thermocouple will be exchanged on an annual basis and the new thermocouple is calibrated at the manufacturer before delivery. No further QA/QC procedure is required.</p> <p>Replacements took place on 15/12/2014 and 15/12/2015 during the monitoring period, with the following thermocouples being</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.		used:  4. 3397084 – 17/12/2013 to 15/12/2014 5. 3397089 – 15/12/2014 to 15/12/2015 6. 3397088 – 15/12/2015 to 30/09/2016  Verifier's action: By means of checking MR, calibration certificate as well as technical data sheet and site records. Conclusion: Due to the above the monitoring equipment has been duly calibrated for the entire monitoring period.		
<b>c) Correctness (VVS, §§ 389-393)</b> Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.	/MR/ /PDD/ /XLS/ /IM01/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)  Description: The value is used to ensure that methane is destroyed efficiently. The minimum value for efficient methane destruction applied is T at least 500 °C at a LFG flow of at least 100 m³/h. Due to this the flare efficiency determination is accordingly set up. In case the flare detection is reporting a flare, the flow is above 100 m³/h (on a minute basis = 100/60) and the temperature is above 500 °C then the flare efficiency is 80% (90% minus 10% for a low height flare). Otherwise it is 50% in case a flare is detected but the other criteria are not met and 0% if none of the criteria is met.  Verifier's action: By means of checking reg PDD, MR, related tool, CDM data spreadsheet Conclusion: The value is monitored and recorded correctly.	OK	OK
<b>N. TDL<sub>y</sub></b>		<b>Average technical transmission and distribution losses in the grid in year y for the voltage level at which electricity is obtained from the grid at the project site.</b>		
<b>a) Measurement / Determination method (VVS, §§ 389-393)</b> Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from	/IM01/ /PDD/ /ACM1/ /TA/ /MR/	Description: the average technical transmission losses in the connected grid are monitored via publication by the grid operator during this monitoring period via:  Value of average transmission losses from the South African	CAR-4	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>ODL to data aggregation level zero (DAL0)).  Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.  Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/DPR/	<p>national electricity utility, Eskom Integrated Report 2015, Statistical Table IA, page 2 available at <a href="http://www.eskom.co.za/IR2015/Documents/Eskom_fact_sheets_2015.pdf">http://www.eskom.co.za/IR2015/Documents/Eskom_fact_sheets_2015.pdf</a></p> <p>The CDM operator is checking on annual basis the latest available value for transmission losses and updates the related CDM Data spreadsheet. The updated information is forwarded by the CDM Operator Envitech to the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p>Besides the above, monthly meetings are held to discuss the project activity progress, actual generation data, problems occurred, upcoming maintenance etc.</p> <p><i>Verifier's action:</i> By means of checking the related internet webpage of the power supplier ESKOM as well as ER spreadsheet, PDD and MR.</p> <p><i>Conclusion:</i> The value is derived correctly and correctly applied. However CAR 4 has been raised.</p>		
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b>  In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.  Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.  Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</p>	/CAL/ /MR/ /PDD/	<p><i>Description:</i> No measurement equipment is involved in the monitoring of this value as it is derived from a document downloaded from the internet.</p> <p><i>Verifier's action:</i> By onsite visit, interview with PP, reg PDD as well as MR.</p> <p><i>Conclusion:</i> No accuracy as no monitoring equipment and QA/QC is considered ok based on documents checked.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><b>c) Correctness</b> (VVS, §§ 389-393)</p> <p>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</p>	<p>/MR/ /PDD/ /XLS/</p>	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The value is derived from the webpage of the power supply company ESKOM.</p> <p><i>Verifier's action:</i> By means of checking the related internet webpage (<a href="http://www.eskom.co.za/IR2015/Documents/Eskom_fact_sheets_2015.pdf">http://www.eskom.co.za/IR2015/Documents/Eskom_fact_sheets_2015.pdf</a>) of the power supplier ESKOM as well as ER spreadsheet, PDD and MR.</p> <p><i>Conclusion:</i> CAR 04 has been raised.</p>	CAR 04	OK
<b>O. Management of SWSD</b>		<b>Management of SWSD</b>		
<p><b>a) Measurement / Determination method</b> (VVS, §§ 389-393)</p> <p>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	<p>/IM01/ /PDD/ /ACM1/ /CAUD/ /WDR/ /COM/</p>	<p><i>Description:</i> The parameter is monitored by site records.</p> <p>The records and information is collected by the landfill operator and PP Durban Solid Waste (DSW), the CDM Project Manager. Thereafter the data are forwarded to the Quality Assurance SLR Consulting Limited for further processing and compilation into the monitoring report and final emission reduction calculation.</p> <p><i>Verifier's action:</i> By onsite observation, interview with PP and personnel as well as check of records and landfill development plan.</p> <p>The Management of the SWDS is operated under defined conditions. As per interview with PP and landfill operator the management and filling is conducted in the same fashion since the beginning e.g. a layer of waste is dumped and covered by a thin layer of soil. This has been checked from the Environmental audit report conducted twice a year. The audit report shows how the landfill is operated and even provides pictures. Further a list of waste amount dumped during 2014, 2015 and for 2016 up to now has been provided including also types of waste dumped.</p> <p><i>Conclusion:</i> Based on the report provided as well as by onsite check the management of the SWDS has not changed due to</p>	OK	OK



Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		the implementation to the project activity.		
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b>  <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.  Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.  Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	<p>/IM01/  / MR/  /CAUD/  / WDR/  /COM/</p>	<p><i>Description:</i> No measurement equipment is used to monitor this parameter. Therefore no accuracy or calibration requirements or procedures applicable.</p> <p>The stated related QA/QC procedure as per monitoring plan is that “any change in the management of the landfill will be justified by referring to technical or regulatory specifications. Also, it will be documented and filed by the landfill operator”.</p> <p><i>Verifier’s action:</i> By onsite observation, besides interview with PP and personnel as well as check of supporting documents.</p> <p><i>Conclusion:</i> As there is no equipment and the management of the landfill did not change this point is considered as fulfilled.</p>	OK	OK
<p><b>c) Correctness (VVS, §§ 389-393)</b>  <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.  In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.  In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	<p>/MR/  / PDD/  /CAUD/  / WDR/  /COM/</p>	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description &amp; Conclusion:</i> No value is monitored. However the management of the landfill has not changed.</p> <p><i>Verifier’s action:</i> By onsite observation, interview with PP and personnel as well as check of records e.g. landfill development plan.</p>	OK	OK
<b>P. BE<sub>CH4</sub>, SWDS,y</b>		Methane generation from the landfill in the absence of the project activity at year y		
<p><b>a) Measurement / Determination method (VVS, §§ 389-393)</b>  <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).  Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used.  Furthermore, verify the frequency of measurements as per</i></p>	<p>/IM01/  / PDD/  /ACM1/  /TA/</p>	<p><i>Description:</i> Not applicable as this parameter is only relevant during RfReg to determine the ex-ante amount of methane generated from the landfill. Thereafter the actual amount of methane destroyed will be directly monitored.</p> <p><i>Verifier’s action:</i> By check of PDD and related methodology and tool.</p> <p><i>Conclusion:</i> Monitored in line with methodology and tool as well as latest monitoring plan.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>				
<p><b>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Annex 2.</i></p>	<p>/IM01/ /MR/ /AMS1/ /TA/</p>	<p><i>Description:</i> Not applicable as not monitored during project operation as only used for ex-ante determination of methane generation from the landfill.</p>	OK	OK
<p><b>c) Correctness (VVS, §§ 389-393)</b></p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	<p>/MR/ /PDD/ /AMS1/ /TA/</p>	<p><input checked="" type="checkbox"/> Correct      <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description &amp; Conclusion:</i> Not applicable as this parameter is only relevant during RfReg to determine the ex-ante amount of methane generated from the landfill. Thereafter the actual amount of methane destroyed will be directly monitored.</p> <p><i>Verifier's action:</i> By check of PDD and related methodology and tool.</p>	OK	OK



## Appendix 6. Calibration dates and validity of installed monitoring equipment

**Table A-6:** Periodic Verification Checklist – Calibration details

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
Electricity meter (main)	EG <sub>PJ,y</sub>	86342181	Landis+Gyr	0.5%	22/03/2006	-	21/03/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		50873189			18/06/2014		17/06/2024		
Electricity meter (back-up)	EG <sub>PJ,y</sub>	95680700	Landis+Gyr	0.5%	12/11/2008	-	11/11/2018	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		50873185			18/06/2014		17/06/2024		
Electricity meter	EC <sub>PJ,y</sub>	85066208	Landis+Gyr	1.0%	26/08/2005	-	25/08/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		50710474			17/06/2014		16/06/2024		
Thermocouple	T <sub>EG,m</sub>	3397084	Type N Thermocouple	0.75%	29/11/2013	Replaced 15/12/2014	28/11/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		3397089				Replaced 15/12/2015		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		3397088				Used until end of MP		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
Thermocouple	Op <sub>flare,h</sub>	3397085	Type N Thermocouple	0.75%	29/11/2013	Replaced 15/12/2014	28/11/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		3397087				Replaced 15/12/2015		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		3397086				Used until end of MP		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
Pressure transmitter	P <sub>t</sub>	2345399	GE	±0.25	-	13/05/2015	12/05/2016	<input type="checkbox"/> No	From: 30/09/2014

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
			Sensing Druck PTX 7900-3399	%				<input checked="" type="checkbox"/> Yes	To: 12/05/2015 And 13/05/2016 till 17/05/2016
		2765987			-	17/05/2016 (date of installation)	16/05/2017	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
Calibration gas	V <sub>CH4,t,db</sub>	50453B 150B 1238151 3	CH <sub>4</sub> , CO <sub>2</sub> and N <sub>2</sub>		19/01/2014	12/02/2015 10/03/2016	18/01/2015 11/02/2016 09/03/2017	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
CH <sub>4</sub> analyzer	V <sub>CH4,t,db</sub>	2309	Edinburgh Instruments Gascard NG	+/- 2.0%	22/08/2013 (factory)	14/08/2014 (Field cals)	21/08/2014 13/08/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		5147			13/03/2014 (factory)	16/10/2014 15/12/2014 07/02/2015 (Field cals)	12/03/2015 15/10/2015 14/12/2015 06/02/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		6855			15/10/2014 (factory)	11/02/2015 06/03/2015 25/05/2015 10/07/2015 28/01/2016 15/02/2016 11/04/2016 27/05/2016 07/06/2016 11/08/2016 (Field cals)	14/10/2015 10/02/2016 05/03/2016 24/05/2016 09/07/2016 27/01/2017 14/02/2017 10/04/2017 26/05/2017 06/06/2017 10/08/2017	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
CH <sub>4</sub> analyzer	V <sub>CH4,t,db</sub>	G500625	Handhel	+/-	15/01/2014	02/02/2015	14/01/2015	<input type="checkbox"/> No	15/01/2015 – 02/02/2015

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
			d Instrument Biogas 5000	0.94%		05/02/2016	01/02/2016 04/02/2017	<input checked="" type="checkbox"/> Yes	and 02/02/2016 – 05/02/2016
Flow meter	V <sub>LFG,total,y,db</sub> V <sub>LFG,sent flare,y,db</sub> V <sub>LFG,EL,y,db</sub>	FD20272 A FD20273 A	Kurz Instruments	+/-2% +20SF PM	30/10/2013	21/10/2014	29/10/2014 20/10/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		K3047D0 2000 K3047E0 2000	Endress & Hauser Proline t-mass 65i	±4%		11/03/2015 02/06/2015 (date of installation) 23/06/2016	10/03/2016 01/06/2016 22/06/2017	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	02/06/2016 – 23/06/2016
Temperature transmitter	T <sub>t</sub>	4600257 0	WIKA TR200	Maximum error 0.8°C		n/a		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		L203E99 4152	E&H Omnigrad TR10	Maximum error 0.35°C				<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To: