




**Verification and certification report form for  
CDM project activities  
(Version 02.1)**

*Complete this form in accordance with the instructions attached at the end of this form.*

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the project activity</b>	Bandeirantes Landfill Gas to Energy Project (BLFGE) UNFCCC ID: 0164
<b>Version number of the verification and certification report</b>	05.0
<b>Completion date of the verification and certification report</b>	29/05/2018
<b>Monitoring period number and duration of this monitoring period</b>	2 <sup>nd</sup> monitoring period (01/09/2012 to 22/12/2017)
<b>Version number of the monitoring report to which this report applies</b>	Version05
<b>Crediting period of the project activity corresponding to this monitoring period</b>	23/12/2010 to 22/12/2017
<b>Project participants</b>	Biogás Energia Ambiental S.A.. Prefeitura Municipal de São Paulo (Municipality of São Paulo). KfW. Mercuria Energy Trading SA. Fortis Bank N.V./S.A..
<b>Host Party</b>	Brazil
<b>Applied methodologies and standardized baselines</b>	ACM0001 - "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11 dated 28/05/2009
<b>Mandatory sectoral scopes linked to the applied methodologies</b>	13 - Waste handling and disposal
<b>Conditional sectoral scope(s) linked to the applied methodologies</b>	Scope 1
<b>Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD</b>	1,175,518 tCO <sub>2</sub> e
<b>Certified amount of GHG emission reductions or GHG removals for this monitoring period</b>	827,027 tCO <sub>2</sub> e
<b>Name and UNFCCC reference number of the DOE</b>	TÜV NORD CERT GmbH Ref No.: E-0022

<b>Name, position and signature of the approver of the verification and certification report</b>	 Rainer Winter Final Approver

**SECTION A. Executive summary**

Biogás Energia Ambiental S.A. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 2<sup>nd</sup> periodic verification of the project: Bandeirantes Landfill Gas to Energy Project (BLFGE) with regard to the relevant requirements for CDM project activities.

This verification covers the period from 01/09/2012 to 22/12/2017 (including both days).

The project activity reduces GHG emissions due to generation of electricity by combusting the landfill gas and to capture and flaring of landfill gas. The installed capacity of the project activity is 22.2 MW. Details of the project location are given below:

**Table A-1: Project Location**

<b>Host Country</b>	Brazil
<b>Region</b>	State of São Paulo
<b>Project location address</b>	between km 25 and km 26 at Bandeirantes highway
<b>Latitude</b>	23° 25' 11.13" S
<b>Longitude</b>	45° 45' 21.69" W

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

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

	<b>Blower</b>	<b>Flare</b>	<b>Electricity Generator</b>	<b>Diesel Generator</b>
<b>Manufacturer</b>	Aerzen	Hofstetter	Caterpillar	Cummins BrasilLtda
<b>Model</b>	GM 130 L / DN 300	Hofgas Efficiency 2500	G3516A	125DGEB-1297
<b>Quantity</b>	4	2	24	1
<b>Capacity per unit</b>	4,250 Nm <sup>3</sup>	Min: 500 Nm <sup>3</sup> /hr	925 kW	125 kW
		Max: 2,500 Nm <sup>3</sup> /hr		

**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/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader	EI	San Valero	Vicente	BRTÜV	x	x	x	x
2.	Verifier								

**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.	Technical reviewer	IR	Winter	Rainer	TÜV NORD CERT
2.	Approver	IR	Winter	Rainer	TÜV NORD CERT
3.	Observer Reviewer	ER	Thanekar	Swapnil	-

## 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 collection, transfer and storage process.	Medium	Data is automatically measured and transferred manually to some spreadsheets. Errors in the data transference have direct impact in the CERs calculation.	Check all the inputs for monitored parameters. Cross check raw data against ER calculations.

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

2.	Calibration records for monitoring equipment.	Low	Calibration is conducted.	Check calibration certificates. Confirm if calibrations were conducted by Accredited persons/companies and verified applied errors if calibration is delayed.
3.	Failure of measurement instruments.	Low	Missing data due to failure of measurement equipment.	Check instruments and operation diary / maintenance records.

## 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.

<b>Parameter</b>	<b>Approach*</b>	<b>Errors* detected</b>	<b>Findings reference</b>	<b>Correc- ted</b>	<b>Remaining verification risk</b>
<b>LFG<sub>Total,y</sub></b>	<i>CDC</i>	<input checked="" type="checkbox"/>	<del>CAR 5<sup>2</sup></del> <del>CAR 6</del>	<input type="checkbox"/>	<i>Not material</i>
<b>LFG<sub>Flare,y</sub></b>	<i>CDC</i>	<input checked="" type="checkbox"/>	<del>CAR 2</del> <del>CAR 3</del>	<input type="checkbox"/>	<i>Not material</i>
<b>LFG<sub>Electricity, y</sub></b>	<i>CDC</i>	<input type="checkbox"/>		<input type="checkbox"/>	<i>Not material</i>
<b>PE<sub>Flares, y</sub></b>	<i>CDC</i>	<input type="checkbox"/>		<input type="checkbox"/>	<i>Not material</i>
<b>W<sub>CH4</sub></b>	<i>CDC</i>	<input type="checkbox"/>		<input type="checkbox"/>	<i>Not material</i>
<b>EL<sub>LFG, y</sub></b>	<i>CDC</i>	<input checked="" type="checkbox"/>	<del>CAR 4</del>	<input type="checkbox"/>	<i>Not material</i>
<b>PE<sub>EC,y</sub> = PE<sub>FC,y</sub></b>	<i>CDC</i>	<input checked="" type="checkbox"/>	<del>CAR 7</del>	<input type="checkbox"/>	<i>Not material</i>
<b>fv<sub>i,h</sub></b>	<i>CDC</i>	<input type="checkbox"/>		<input type="checkbox"/>	<i>Not material</i>
<b>FV<sub>RG,h</sub></b> (Please refer to <b>W<sub>CH4</sub></b> )	<i>CDC</i>	<input type="checkbox"/>		<input type="checkbox"/>	<i>Not material</i>
<b>T<sub>flare</sub></b>	<i>CDC</i>	<input type="checkbox"/>		<input type="checkbox"/>	<i>Not material</i>
<b>CEF<sub>elec,y,BL,y</sub> = EF<sub>CM,grid,y</sub></b>	<i>CDC</i>	<input checked="" type="checkbox"/>	<del>CAR 1</del>	<input type="checkbox"/>	<i>Not material</i>
<b>EF<sub>CO2, e</sub></b>	<i>CDC</i>	<input type="checkbox"/>		<input type="checkbox"/>	<i>Not material</i>
<b>EC<sub>PJ,j,y</sub></b>	<i>CDC</i>	<input type="checkbox"/>		<input type="checkbox"/>	<i>Not material</i>
<b>Aggregate</b>					<i>Materiality threshold not exceeded</i>

\*) 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 and no major revision of the overall plan was required as no materiality threshold was exceeded.

<sup>2</sup> The findings are crossed out as they are closed during the course of verification. This representation is applied for the entire report.

**SECTION D. Means of verification****D.1. Desk/document 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;
- \* the last revision of the validation report;
- \* the monitoring report, including the claimed emission reductions for the project;
- \* the emission reduction calculation spreadsheets.

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: 29/03/2018				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening meeting	Bandeirantes Landfill	29/03/2018	Vicente San Valero
2.	Walk through the site and Inspection of flaring system, control room and location of the meters			
3.	Interviews with Landfill manager, Administrative, Consultant			
4.	ER and PE calculation review			
5.	Evidences assessment			
6.	Presentation of findings - Closing meeting			

**D.3. Interviews**

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Alves da Silva	Anderson	Biogás Energia Ambiental S.A.	29/03/2018	Landfill Manager	Vicente San Valero
2.	Pacheco Souza	Juliana			Administration	
3.	M. Nagai	Karen	EQAO		CDM Consultant	

**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

1) Sampling Approaches:

SiRS: Simple Random Sampling

StRS: Stratified Random Sampling

SS: Systematic Sampling

CS: Cluster Sampling

MSS: Multi-stage Sampling

AS: Acceptance Sampling

2) Sampling Types:

PS: Parameter Sampling

### D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form (E1)	-	-	-
Compliance of the project implementation and operation with the registered PDD (E3)	-	-	-
Post-registration changes (E4)	-	-	-
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines (E5)	-		-
Compliance of monitoring activities with the registered monitoring plan (E6)	CL-1	-	-
Compliance with the calibration frequency requirements for measuring instruments (E7)	CL-2	CAR-2, CAR-3	-
Assessment of data and calculation of emission reductions or net removals (E8)	-	CAR-1, CAR-4, CAR-5, CAR-6, CAR-7	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
<b>Total</b>	<b>2</b>	<b>7</b>	<b>0</b>

## SECTION E. Verification findings

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

Means of verification	<p>A draft monitoring report was submitted to the verification team by the project participants. The DOE has made this report publicly available on 01/03/2018, 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>• /A 10/ - /MR/;</li><li>• /A 5/ - /CDM-MR-FORM/.</li></ul>									
Findings	<table><tr><td><input checked="" type="checkbox"/></td><td>The latest reporting template CDM-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.</td></tr><tr><td><input checked="" type="checkbox"/></td><td>The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.</td></tr><tr><td><input type="checkbox"/></td><td>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</td></tr><tr><td></td><td></td></tr></table>		<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 type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:		
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<input type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:									
Conclusion	<table><tr><td><input checked="" type="checkbox"/></td><td>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.</td></tr><tr><td><input type="checkbox"/></td><td>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.</td></tr><tr><td></td><td></td></tr></table>		<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.				
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<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.									

**E.2. Remaining forward action requests from validation and/or previous verifications**

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 and the previous verification report, 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 checked="" type="checkbox"/>	There were no open issues which have been addressed in the previous verification report
<input 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 and operation 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, maintenance records and 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>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /A 7/ - /Registered CDM-PDD/;</li> <li>• /A 8/ - /Validation opinion for renewal of the crediting period report/;</li> <li>• /A 9/ - /Verification and Certification Report/;</li> <li>• /A 10/ - /MR/;</li> <li>• /A 3/ - /CDM STANDARDS/;</li> <li>• /A 11/ - /ER's Spreadsheet/.</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):	
	<input type="checkbox"/> In this context the following CARs, CLs have been raised:	



<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.
	All features of the CDM project activity including the equipment's, data collecting systems and storage have been implemented in accordance with the registered PDD. The project activity is completely operational and the same has been confirmed during the on-site visit.	

#### E.4. Post-registration changes

##### E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines

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	<table border="1"> <tr> <td>Title</td> <td></td> </tr> <tr> <td>Status</td> <td><input type="checkbox"/>under approval;<input type="checkbox"/>approved (approval No.: )</td> </tr> <tr> <td>Appr.date</td> <td></td> </tr> <tr> <td>Ref. No.</td> <td></td> </tr> </table>	Title		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.: )	Appr.date		Ref. No.	
Title										
Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.: )									
Appr.date										
Ref. No.										
	2	<table border="1"> <tr> <td>Title</td> <td></td> </tr> <tr> <td>Status</td> <td><input type="checkbox"/>under approval;<input type="checkbox"/>approved (approval No.: )</td> </tr> <tr> <td>Appr.date</td> <td></td> </tr> <tr> <td>Ref.No.</td> <td></td> </tr> </table>	Title		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.: )	Appr.date		Ref.No.	
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: <table border="1"><tr><td></td></tr></table>								
	2	Issue: <table border="1"><tr><td></td></tr></table>								
<input type="checkbox"/>	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:									
	1	Issue: <table border="1"><tr><td></td></tr></table>								
	2	Issue: <table border="1"><tr><td></td></tr></table>								

##### E.4.2. Corrections

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

<input checked="" type="checkbox"/>	During the verification of the current MP no need for corrections has been identified.	
<input type="checkbox"/>	The following corrections have been applied:	
1	Issue:	
2	Issue:	
The PDD has been revised accordingly: (New) version No.: Revision date:		
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 type="checkbox"/> A related post registration change has been submitted prior to the issuance request. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z. <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. Change to the start date of the crediting period of the project activity**

<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 § 234 and § 235 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 § 236 and as per §237 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**

<input checked="" type="checkbox"/>	N/A - as this monitoring plan was part of the registered PDD
<input type="checkbox"/>	In line with PS § 238 and §78 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 § 78 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 PS § 238 and §78 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.

**E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other applied standards or tools**

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 checked="" type="checkbox"/>	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period		
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref. No.	
	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:	

#### E.4.6. Changes to the project design

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 checked="" type="checkbox"/>	No CoPD has been submitted to the UNFCCC prior to the current monitoring period		
<input type="checkbox"/>	The following CoPD have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref. No.	
	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. Changes specific to afforestation and reforestation project activities**

<input checked="" type="checkbox"/>	N/A - as this is no A/R project activity
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**E.5. Compliance of the registered monitoring plan with the methodology including applicable tools and standardized baselines**

<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>• /A 10/ - /MR/;</li> <li>• /A 1/ - /ACM0001/;</li> <li>• /A 2/ - /CDM TOOLS/.</li> </ul>																																								
<b>Findings</b>	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td colspan="2">The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)</td> </tr> <tr> <td></td> <td colspan="2">The breakdown of MP accordance of the referenced tools is as follows:</td> </tr> <tr> <td rowspan="10"><input checked="" type="checkbox"/></td> <td rowspan="3">1</td> <td>Title (of the tool)</td> <td>"Tool to determine project emissions from flaring gases containing methane"</td> </tr> <tr> <td>Version</td> <td>version 01</td> </tr> <tr> <td>MP compliance</td> <td> <input checked="" type="checkbox"/> full compliance  <input type="checkbox"/> findings have been raised  <input type="checkbox"/> N/A (for MP)         </td> </tr> <tr> <td rowspan="3">2</td> <td>Title (of the tool)</td> <td>"Tool for the demonstration and assessment of additionality"</td> </tr> <tr> <td>Version</td> <td>version 06.0.0</td> </tr> <tr> <td>MP compliance</td> <td> <input checked="" type="checkbox"/> full compliance  <input type="checkbox"/> findings have been raised  <input type="checkbox"/> N/A         </td> </tr> <tr> <td rowspan="3">3</td> <td>Title (of the tool)</td> <td>"Emissions from solid waste disposal sites"</td> </tr> <tr> <td>Version</td> <td>version 06.0.0</td> </tr> <tr> <td>MP compliance</td> <td> <input checked="" type="checkbox"/> full compliance  <input type="checkbox"/> findings have been raised  <input type="checkbox"/> N/A         </td> </tr> <tr> <td rowspan="3">4</td> <td>Title (of the tool)</td> <td>"Tool to calculate the emission factor for an electricity system"</td> </tr> <tr> <td>Version</td> <td>version 02.2.1</td> </tr> <tr> <td>MP compliance</td> <td> <input checked="" type="checkbox"/> full compliance  <input type="checkbox"/> findings have been raised  <input type="checkbox"/> N/A         </td> </tr> <tr> <td>5</td> <td>Title (of the tool)</td> <td>"Tool to calculate baseline, project, and/or leakage emissions from electricity"</td> </tr> </table>			<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)			The breakdown of MP accordance of the referenced tools is as follows:		<input checked="" type="checkbox"/>	1	Title (of the tool)	"Tool to determine project emissions from flaring gases containing methane"	Version	version 01	MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)	2	Title (of the tool)	"Tool for the demonstration and assessment of additionality"	Version	version 06.0.0	MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A	3	Title (of the tool)	"Emissions from solid waste disposal sites"	Version	version 06.0.0	MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A	4	Title (of the tool)	"Tool to calculate the emission factor for an electricity system"	Version	version 02.2.1	MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A	5	Title (of the tool)	"Tool to calculate baseline, project, and/or leakage emissions from electricity"
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5	Title (of the tool)	"Tool to calculate baseline, project, and/or leakage emissions from electricity"																																							

			consumption"
		Version	version 1
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A
	6	Title (of the tool)	"Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"
		Version	version 02
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A
<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.			
All monitoring parameters, monitoring and calibration procedures follow the methodology and applicable methodological tools requirements.			

## 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>	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. Further it has been checked whether the GWP for the respective period have been correctly applied. The following list of ex-ante fixed parameters have been applied:				
	Nbr.	Parameter abbreviation	Description	Value	Unit
	1	AF	Adjustment factor	20	%
	2	D <sub>CH4</sub>	Methane density at normal temperature and pressure (0°C and 1.013 bar)	0.0007168	(tCH <sub>4</sub> /m <sup>3</sup> CH <sub>4</sub> )
	3	MD <sub>Hist</sub>	Amount of methane destroyed historically for the previous year before the start of project activity.	8.07% of MG <sub>HIST</sub>	t <sub>CH4</sub>
	4	MG <sub>Hist</sub>	Amount of methane generated historically for the previous year before the start of project activity	N/A	t <sub>CH4</sub>
	5	MD <sub>Project, 1</sub>	Amount of methane destroyed by the project activity during the first year of the project activity	43,417,990	Nm <sup>3</sup> CH <sub>4</sub>
	6	MG <sub>PR, 1</sub>	Amount of methane generated during the first year of the project activity (Nm <sup>3</sup> CH <sub>4</sub> )	102,891,281	Nm <sup>3</sup> CH <sub>4</sub>
	7	φ	Model correction factor to	0.9	--

			account for model uncertainties																																			
	8	<b>OX</b>	Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)	0.1	--																																	
	9	<b>F</b>	Fraction of methane in the SWDS gas (volume fraction)	0.5	--																																	
	10	<b>DOC<sub>f</sub></b>	Fraction of degradable organic carbon (DOC) that can decompose	0.5	--																																	
	11	<b>MCF</b>	Methane correction factor	1.0	--																																	
	12	<b>DOC<sub>j</sub></b>	Fraction of degradable organic carbon (by weight) in the waste type j	<table border="1"> <thead> <tr> <th>DOC<sub>j</sub> (%wet waste)</th> <th>Waste type j</th> </tr> </thead> <tbody> <tr> <td>43</td> <td>Wood and wood products</td> </tr> <tr> <td>40</td> <td>Pulp, paper and cardboard</td> </tr> <tr> <td>15</td> <td>Food, food waste, beverages and tobacco</td> </tr> <tr> <td>24</td> <td>Textiles</td> </tr> <tr> <td>20</td> <td>Garden, yard and park waste</td> </tr> <tr> <td>0</td> <td>Glass, plastic, metal, other inert waste</td> </tr> </tbody> </table>	DOC <sub>j</sub> (%wet waste)	Waste type j	43	Wood and wood products	40	Pulp, paper and cardboard	15	Food, food waste, beverages and tobacco	24	Textiles	20	Garden, yard and park waste	0	Glass, plastic, metal, other inert waste	--																			
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13	<b>p<sub>n, j, x</sub></b>	Weight fraction of the waste type j in the sample n collected during the year x	<table border="1"> <thead> <tr> <th>Type of Waste</th> <th>% (wet basis)</th> </tr> </thead> <tbody> <tr> <td>Wood and wood products</td> <td>0.66 %</td> </tr> <tr> <td>Pulp, paper and cardboard</td> <td>12.32 %</td> </tr> <tr> <td>Food, food waste, beverages and tobacco</td> <td>60.62 %</td> </tr> <tr> <td>Textiles</td> <td>3.14 %</td> </tr> <tr> <td>Garden, yard and park waste</td> <td>3.21 %</td> </tr> <tr> <td>Glass, plastic, metal, other inert waste</td> <td>18.79 %</td> </tr> </tbody> </table>	Type of Waste	% (wet basis)	Wood and wood products	0.66 %	Pulp, paper and cardboard	12.32 %	Food, food waste, beverages and tobacco	60.62 %	Textiles	3.14 %	Garden, yard and park waste	3.21 %	Glass, plastic, metal, other inert waste	18.79 %	--																				
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14	<b>W<sub>x</sub></b>	Total amount of organic waste prevented from disposal in year x (tons)	<table border="1"> <thead> <tr> <th>Year</th> <th>Waste disposed (tons)</th> </tr> </thead> <tbody> <tr><td>1979</td><td>37,450</td></tr> <tr><td>1980</td><td>229,040</td></tr> <tr><td>1981</td><td>231,408</td></tr> <tr><td>1982</td><td>313,633</td></tr> <tr><td>1983</td><td>321,956</td></tr> <tr><td>1984</td><td>325,585</td></tr> <tr><td>1985</td><td>408,887</td></tr> <tr><td>1986</td><td>801,366</td></tr> <tr><td>1987</td><td>1,017,866</td></tr> <tr><td>1988</td><td>1,283,852</td></tr> <tr><td>1989</td><td>977,852</td></tr> <tr><td>1990</td><td>1,206,964</td></tr> <tr><td>1991</td><td>1,224,954</td></tr> <tr><td>1992</td><td>1,508,817</td></tr> <tr><td>1993</td><td>1,377,148</td></tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Year</th> <th>Waste disposed (tons)</th> </tr> </thead> <tbody> </tbody> </table>	Year	Waste disposed (tons)	1979	37,450	1980	229,040	1981	231,408	1982	313,633	1983	321,956	1984	325,585	1985	408,887	1986	801,366	1987	1,017,866	1988	1,283,852	1989	977,852	1990	1,206,964	1991	1,224,954	1992	1,508,817	1993	1,377,148	Year	Waste disposed (tons)	Tons
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			1994	1,616,710	
			1995	1,823,170	
			1996	1,971,651	
			1997	1,992,386	
			1998	2,142,325	
			1999	2,305,464	
			2000	1,964,424	
			2001	2,043,617	
			2002	2,082,855	
			2003	1,993,371	
			2004	1,965,347	
			2005	1,594,350	
			2006	1,974,799	
			2007	489,627	
15	Kj	Decay rate for the waste type j	Waste Type	kj	--
			Pulp, paper, cardboard and textiles	0.070	
			Wood, wood products and straw	0.035	
			Other (non-food) organic putrescible garden and park waste	0.170	
			Food, food waste, sewage sludge, beverages and tobacco	0.400	
16	GWP <sub>CH4</sub>	Global Warming Potential of CH <sub>4</sub> - first commitment period of the Kyoto Protocol	21.0		tCO <sub>2</sub> e/tCH <sub>4</sub>
17	GWP <sub>CH4</sub>	Global Warming Potential of CH <sub>4</sub>	25.0		tCO <sub>2</sub> e/tCH <sub>4</sub>
18	BE <sub>CH4,SWDS,y</sub>	Methane generation from the landfill in the absence of the project activity at year y	n/a for ex-post calc as per CDM-PDD		(tCO <sub>2</sub> e)
19	Regulatory requirements relating to landfill gas projects - <i>There are neither regulatory requirements nor legal obligations to destroy the LFG.</i>				
Version 01 of the Tool to determine project emissions from flaring gases containing methane					
Nbr.	Parameter abbreviation	Description	Value	Unit	
1	AM <sub>c</sub>	Atomic mass of carbon	12.00	(kg/mol)	
2	AM <sub>H</sub>	Atomic mass of hydrogen	1.01	(kg/mol)	
3	AM <sub>o</sub>	Atomic mass of oxygen	16.00	(kg/mol)	
4	AM <sub>N</sub>	Atomic mass of nitrogen	14.01	(kg/mol)	
5	MM <sub>CH4</sub>	Molecular mass of carbon methane	16.04	kg/kmol	
6	MM <sub>CO</sub>	Molecular mass of carbon monoxide	28.01	kg/kmol	
7	MM <sub>CO2</sub>	Molecular mass of carbon dioxide	44.01	kg/kmol	
8	MM <sub>O2</sub>	Molecular mass of oxygen	32.00	kg/kmol	
9	MM <sub>H2</sub>	Molecular mass of hydrogen	2.02	kg/kmol	
10	MM <sub>N2</sub>	Molecular mass of nitrogen	28.02	kg/kmol	
The following sources of information have been used in this context:					
<ul style="list-style-type: none"> <li>/A 7/ - /Registered CDM-PDD/;</li> <li>/A 8/ - /Validation opinion for renewal of the crediting period report/;</li> <li>/A 9/ - /Verification and Certification Report/;</li> </ul>					

	<ul style="list-style-type: none"> <li>• /A 10/ - /MR/;</li> <li>• /A 3/ - /CDM STANDARDS/;</li> <li>• /A 11/ - /ER's Spreadsheet/.</li> </ul>						
<b>Findings</b>	<table border="1"> <tr> <td><input type="checkbox"/></td><td>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.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification: Not all parameters fixed ex-ante (registered PDD) are presented in section B.1 of the Monitoring Report version 1.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>In this context the following CARs, CLs, FARs have been raised: <b>CL-1</b> Not all parameters fixed ex-ante (registered PDD) are presented in section B.1 of the Monitoring Report version 1.</td></tr> </table>	<input 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 checked="" type="checkbox"/>	The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification: Not all parameters fixed ex-ante (registered PDD) are presented in section B.1 of the Monitoring Report version 1.	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: <b>CL-1</b> Not all parameters fixed ex-ante (registered PDD) are presented in section B.1 of the Monitoring Report version 1.
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#### E.6.2. Data and parameters monitored

<b>Means of verification</b>	<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> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /A 7/ - /Registered CDM-PDD/;</li> <li>• /A 8/ - /Validation opinion for renewal of the crediting period report/;</li> <li>• /A 10/ - /MR/;</li> <li>• /A 3/ - /CDM STANDARDS/;</li> <li>• /A 11/ - /ER's Spreadsheet/;</li> <li>• /A 30/ - BLFGE Procedures.</li> </ul>						
<b>Findings</b>	<table border="1"> <tr> <td colspan="2">For details please refer to Appendix 5.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>In this context the following CARs, CLs, FARs have been raised: <b>CAR-4</b> - inconsistencies in exported electricity values. <b>CAR-5</b> - inconsistencies in measured LFG (FIR-100, FIR-700). <b>CAR-6</b> - inconsistencies in measured LFG (FIR-200, FIR-700).</td></tr> </table>	For details please refer to Appendix 5.		<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: <b>CAR-4</b> - inconsistencies in exported electricity values. <b>CAR-5</b> - inconsistencies in measured LFG (FIR-100, FIR-700). <b>CAR-6</b> - inconsistencies in measured LFG (FIR-200, FIR-700).		
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	<p><u>QA/QC BLFGE Procedures</u></p> <p>PO-001: Procedure about re-starting the plant after an electricity breakdown;  PO-002: Calibration of methane analyser;  PO-003: Calibration of valve (flare);  PO-004: Service orders and maintenance;  PO-005: Procedure of monitoring parameters (including calibration plan);  PO-006: Procedure about internal monitoring of Bandeirantes;  PO-007: Procedure about workers control;  PO-008: Procedure for the elaboration of the monthly operational report;  PO-009: Procedure in emergency situations;  PO-010: Procedure for data back-up of the supervisory system;  PO-011: Procedure for manual data collection;  PO-012: Instruction for Refuelling the Diesel Device;  PO-013: Identification of legal and other requirements;  PO-014: Administrative Procedure.</p> <p>Where corrections were required, revised ER calculation and MR were prepared by the PPs and presented to the verification team. All above summarized raised issues were addressed appropriately so that it can be confirmed that the final ER calculation is overall correct.</p> <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>
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### E.6.3. Implementation of sampling plan

Means of verification	<p>The verification team has been checked whether the PPs have applied a sampling approach to determine the monitored values.</p> <p>Further it has been checked whether the PPs have correctly applied the implemented sampling plan including</p> <ul 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></ul> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"><li>• /A 7/ - /Registered CDM-PDD/;</li><li>• /A 10/ - /MR/;</li><li>• /A 11/ - /ER's Spreadsheet/.</li></ul>																											
Findings	<table><tr><td><input checked="" type="checkbox"/></td><td colspan="3">The PPs have not applied sampling approaches for the parameters monitored.</td></tr><tr><td rowspan="6"><input type="checkbox"/></td><td rowspan="6">1</td><td colspan="2">The PPs have applied sampling approaches for the following parameters monitored.</td></tr><tr><td>Parameter:</td><td></td></tr><tr><td>Name:</td><td></td></tr><tr><td>Description on how the sampling efforts and survey comply with the validated sampling plan:</td><td></td></tr><tr><td>2</td><td>Parameter:</td><td></td></tr><tr><td>Name:</td><td></td></tr><tr><td></td><td></td><td>Description on how the sampling efforts and survey comply with the validated sampling plan:</td><td></td></tr><tr><td><input type="checkbox"/></td><td colspan="3">In this context the following CARs, CLs, FARs have been raised:</td></tr></table>	<input checked="" type="checkbox"/>	The PPs have not applied sampling approaches for the parameters monitored.			<input type="checkbox"/>	1	The PPs have applied sampling approaches for the following parameters monitored.		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:		
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<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.

### 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 (0).</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /A 10/ - /MR/;</li> <li>• /A 3/ - /CDM STANDARDS/;</li> <li>• /A 29/ - /Accuracy Documentation</li> <li>• /A 18/ to /A 28/ - /Calibration Documentation;</li> <li>• /A 12/ - /Calibration Summary Spreadsheet/.</li> </ul>						
<b>Findings</b>	<table border="1"> <tr> <td><input type="checkbox"/></td> <td>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.</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td> <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 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 0.</p> </td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td> <p>In this context the following CARs, CLs, FARs have been raised:</p> <p><b>CL-2</b> - PP is requested to provide evidences of certificates/calibrations and accuracy and/or class of all instruments.</p> <p><b>CAR-2</b> - inconsistencies in accuracy and/or applied errors.</p> <p><b>CAR-3</b> - MR is not addressing the delay or lack of calibration in various periods.</p> </td> </tr> </table>	<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 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 0.</p>	<input checked="" type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p><b>CL-2</b> - PP is requested to provide evidences of certificates/calibrations and accuracy and/or class of all instruments.</p> <p><b>CAR-2</b> - inconsistencies in accuracy and/or applied errors.</p> <p><b>CAR-3</b> - MR is not addressing the delay or lack of calibration in various periods.</p>
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<input checked="" type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p><b>CL-2</b> - PP is requested to provide evidences of certificates/calibrations and accuracy and/or class of all instruments.</p> <p><b>CAR-2</b> - inconsistencies in accuracy and/or applied errors.</p> <p><b>CAR-3</b> - MR is not addressing the delay or lack of calibration in various periods.</p>						
<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>Evidences were provided and where corrections in accuracy, applied errors and/or uncovered calibration periods were required, revised ER calculation, Calibration spreadsheet and MR were prepared by the PPs and presented to the verification team. All above summarized raised issues were addressed appropriately so that it can be confirmed that the final ER calculation is overall correct.</p>	<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.		
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<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.						

### 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>
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	<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>• /A 10/ - /MR/;</li> <li>• /A 3/ - /CDM STANDARDS/;</li> <li>• /A 18/ to /A 28/ - /Calibration Documentation</li> <li>• /A 11/ - /ER's Spreadsheet/;</li> <li>• /A 16/ - /Eletrapaulo data-spreadsheets/;</li> <li>• /A 29/ - /Accuracy Documentation/;</li> <li>• /A 14/ - /PLC data-spreadsheets/.</li> </ul>						
<b>Findings</b>	<table border="1"> <tr> <td data-bbox="467 779 544 1115" style="text-align: center; vertical-align: middle;"><input checked="" type="checkbox"/></td><td data-bbox="544 779 1458 1115"> <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 data-bbox="467 1115 544 1182" style="text-align: center; vertical-align: middle;"><input type="checkbox"/></td><td data-bbox="544 1115 1458 1182"> <p>The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.</p> </td></tr> <tr> <td data-bbox="467 1182 544 1249" style="text-align: center; vertical-align: middle;"><input type="checkbox"/></td><td data-bbox="544 1182 1458 1249"> <p>In this context the following CARs, CLs, FARs have been raised:</p> </td></tr> </table>	<input checked="" 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 type="checkbox"/>	<p>The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.</p>	<input type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p>
<input checked="" 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 type="checkbox"/>	<p>The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.</p>						
<input type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p>						
<b>Conclusion</b>	<table border="1"> <tr> <td data-bbox="467 1339 544 1406" style="text-align: center; vertical-align: middle;"><input checked="" type="checkbox"/></td><td data-bbox="544 1339 1458 1406"> <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="467 1406 544 1496" style="text-align: center; vertical-align: middle;"><input type="checkbox"/></td><td data-bbox="544 1406 1458 1496"> <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>All performed calculations for baseline emissions, as reported in the latest versions of the MR and ER calculation spreadsheet, were verified to be performed under full conformance with applicable requirements of the registered PDD, applied methodology and applicable methodological tools.</p> <p>The project activity provides the CERs calculation as defined by the applied methodology ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities" Version 11.</p> <p>The baseline emissions are calculated as following:</p> $BE_y = (MD_{project,y} - MD_{BL,y}) \times GWP_{CH_4,y} + EL_{LFG,y} \times CEF_{elec,BL,y} + ET_{LFG,y} \times CEF_{ther,BL,y}$ <p>Where:</p> <p><math>BE_y</math> = Baseline emissions in year y (tCO<sub>2</sub>e/yr);</p> <p><math>MD_{project,y}</math> = The amount of methane that would have been destroyed/combusted during the year, in tonnes of methane (tCH<sub>4</sub>) in project scenario;</p> <p><math>MD_{BL,y}</math> = The amount of methane that would have been destroyed/combusted during the year in the absence of</p>	<input checked="" 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 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 checked="" 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 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>the project due to regulatory and/or contractual requirement, in tonnes of methane (tCH<sub>4</sub>);</p> <p><math>GWP_{CH_4,y}</math> = Global Warming Potential value for methane;</p> <p><math>EL_{LFG,y}</math> = Net quantity of electricity produced using LFG, which in the absence of the project activity would have been produced by power plants connected to the grid or by an on-site/off-site fossil fuel based captive power generation, during year y, in megawatt hours(MWh);</p> <p><math>CEF_{elec,BL,y}</math> = CO<sub>2</sub> emissions intensity of the baseline source of electricity displaced, in tCO<sub>2</sub>e/MWh;</p> <p><math>ET_{LFG,y}</math> = The quantity of thermal energy produced utilizing the landfill gas, which in the absence of the project activity would have been produced from onsite/offsite fossil fuel fired boiler/air heater, during the year y in TJ;</p> <p><math>CEF_{ther,BL,y}</math> = CO<sub>2</sub> emissions intensity of the fuel used by boiler/air heater to generate thermal energy which is displaced by LFG based thermal energy generation, in tCO<sub>2</sub>e/TJ.</p> <p><math>MD_{BL,y} = MD_{project,y} \times AF</math> (the 20% AF considered in the 1<sup>st</sup> crediting period was applied in this verification).</p> <p>GWP applied up to 31/12/2012 is 21 tCO<sub>2</sub>/tCH<sub>4</sub> and 25 tCO<sub>2</sub>/tCH<sub>4</sub> was applied from 01/01/2013 onwards (CMP 7<sup>th</sup> session, decision 4/CMP.7).</p> <p>Since thermal energy is not produced in the project activity (but electricity only), <math>ET_{LFG,y}</math> and <math>CEF_{ther,BL,y}</math> are zero.</p> <p><math>CEF_{elec,BL,y} = EF_{CM,grid,y}</math> - Electricity Baseline Emission Factor: Calculated using <math>EF_{OM}</math> and <math>EF_{BM}</math> from the Brazilian DNA/MCTIC (2012 to 2017) - "Tool to calculate the emission factor for an electricity system".</p> <p><math>EF_{grid,CM,y} = EF_{grid,OM,y} * w_{OM} + EF_{grid,BM,y} * w_{BM}</math></p> <p>Where,</p> <p><math>EF_{grid,BM,y}</math> = Build margin CO<sub>2</sub> emission factor in year y (tCO<sub>2</sub>/MWh);</p> <p><math>EF_{grid,OM,y}</math> = Operating margin CO<sub>2</sub> emission factor in year y (tCO<sub>2</sub>/MWh);</p> <p><math>w_{OM}</math> = Weighting of operating margin emissions factor (%);</p> <p><math>w_{BM}</math> = Weighting of build margin emissions factor (%).</p> <p>According with the Tool, values adopted for <math>w_{OM}</math> and <math>w_{BM}</math> were equal to 0.25 and 0.75, respectively, for the 2<sup>nd</sup> crediting period.</p> <p><math>MD_{project,y} = MD_{flared,y} + MD_{electricity,y} + MD_{thermal,y} + MD_{PL,y}</math></p> <p>There is no methane sent to the pipeline for feeding to the natural gas distribution network neither production of thermal energy.</p> <p><math>MD_{project,y} = MD_{mainline,y} + MD_{secondaryline,y}</math></p> <p>Where,</p> <p><math>MD_{mainline,y}</math> = Quantity of methane destroyed in the flare F100(LFG<sub>FIR200,y</sub>, measured by the flow-meter FIR200) and the sum of the amount of LFG destroyed in the power plant (measured by the flow-meters FIR300 -LFG<sub>FIR300,y</sub>, FIR400 - LFG<sub>FIR400,y</sub>, FIR500 - LFG<sub>FIR500,y</sub> and FIR600 - LFG<sub>FIR600,y</sub> = power house/electricity generation to the grid);</p> <p><math>MD_{secondaryline,y}</math> = Quantity of methane destroyed in the flare F200 (LFG<sub>FIR700,y</sub>, measured by the flow-meter FIR700).</p>
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### E.8.2. Calculation of project GHG emissions or actual net anthropogenic 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> </ul>
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	<ul style="list-style-type: none"> <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>/A 10/ - /MR/;</li> <li>/A 3/ - /CDM STANDARDS/;</li> <li>/A 18/ to /A 28/ - /Calibration Documentation</li> <li>/A 11/ - /ER's Spreadsheet/;</li> <li>/A 16/ - /Eletropaulo data-spreadsheets/;</li> <li>/A 29/ - /Accuracy Documentation/;</li> <li>/A 14/ - /PLC data-spreadsheets/.</li> </ul>						
<b>Findings</b>	<table border="1"> <tr> <td data-bbox="467 689 544 1025" style="text-align: center; vertical-align: middle;"><input checked="" type="checkbox"/></td><td data-bbox="544 689 1463 1025"> <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="467 1025 544 1093" style="text-align: center; vertical-align: middle;"><input type="checkbox"/></td><td data-bbox="544 1025 1463 1093"> <p>The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.</p> </td></tr> <tr> <td data-bbox="467 1093 544 1283" style="text-align: center; vertical-align: middle;"><input checked="" type="checkbox"/></td><td data-bbox="544 1093 1463 1283"> <p>In this context the following CARs, CLs, FARs have been raised:</p> <p><b>CAR-7</b></p> <p>MR mentions that 1.3 tCO<sub>2</sub>/MWh default value (EF<sub>EL,j,y</sub>) is used to calculate PE<sub>EC,y</sub> emissions. However, calculation at "Bandeirantes ER" spreadsheet / worksheet "Project Emissions" is using the EF<sub>CO<sub>2</sub>,D,t</sub> IPCC 2006 default data for diesel oil based on upper limit.</p> </td></tr> </table>	<input checked="" 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 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><b>CAR-7</b></p> <p>MR mentions that 1.3 tCO<sub>2</sub>/MWh default value (EF<sub>EL,j,y</sub>) is used to calculate PE<sub>EC,y</sub> emissions. However, calculation at "Bandeirantes ER" spreadsheet / worksheet "Project Emissions" is using the EF<sub>CO<sub>2</sub>,D,t</sub> IPCC 2006 default data for diesel oil based on upper limit.</p>
<input checked="" 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 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><b>CAR-7</b></p> <p>MR mentions that 1.3 tCO<sub>2</sub>/MWh default value (EF<sub>EL,j,y</sub>) is used to calculate PE<sub>EC,y</sub> emissions. However, calculation at "Bandeirantes ER" spreadsheet / worksheet "Project Emissions" is using the EF<sub>CO<sub>2</sub>,D,t</sub> IPCC 2006 default data for diesel oil based on upper limit.</p>						
<b>Conclusion</b>	<table border="1"> <tr> <td data-bbox="467 1373 544 1440" style="text-align: center; vertical-align: middle;"><input type="checkbox"/></td><td data-bbox="544 1373 1463 1440"> <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="467 1440 544 1529" style="text-align: center; vertical-align: middle;"><input checked="" type="checkbox"/></td><td data-bbox="544 1440 1463 1529"> <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>Where corrections were required, a revised project emissions calculation and MR were prepared by the PPs and presented to the verification team. Above raised issue was addressed appropriately so that it can be confirmed that the project emissions calculation is overall correct.</p> <p><b>Flaring</b></p> <p>Project emissions from flaring are calculated as established in the registered PDD and according to the "Tool to determine project emissions from flaring gases containing methane":</p> $PE_{\text{flare F200,y}} = \sum_{h=1}^{8760} TM_{RG,h} \times (1 - \eta_{\text{flare,k}}) \times \left( \frac{GWP_{CH_4}}{1000} \right)$ <p>Where,</p> <p>TM<sub>RG,h</sub> = Mass flow rate of methane in the residual gas in the hour h;</p> <p>η<sub>flare,k</sub> = Flare efficiency in hour h.</p> <p>As described in the registered PDD, flare efficiency considered in the project activity is 90% (default value of the tool for enclosed flares).</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>		
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<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>						

**Electricity consumption**

According to ACM0001 (version 11.0), project emissions are calculated as follows:

$$PE_y = PE_{EC,y} + PE_{FC,j,y}$$

Where,

$PE_{EC,y}$  = Emissions from consumption of electricity in the project case;

$PE_{FC,j,y}$  = Emissions from consumption of heat in the project case.

Project emissions from electricity consumption ( $PE_{EC,y}$ ) are calculated following the procedures set out by the methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation".

$$PE_{EC,y} = \sum_j EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y})$$

Where,

$PE_{EC,y}$  = Project emissions from electricity consumption by the project activity during the year y (tCO<sub>2</sub>/year);

$EC_{PJ,j,y}$  = Quantity of electricity consumed by the project electricity consumption source j in year y (MWh)

$EF_{EL,j,y}$  = Emission factor for electricity generation for source j in year y (tCO<sub>2</sub>/MWh)

$TDL_{j,y}$  = Average technical transmission and distribution losses for providing electricity to source j in year y

j = Sources of electricity consumption in the project

The electricity consumed by the plant is monitored through hours of operation from generator while applying the maximum output capacity of the generator 125kW. It was noticed that a complete hour is registered in the PLC system even if the generator has operated, for instance, for only 15 minutes (minute 'values' rounded to 01 hour). Since the diesel generator is located inside BLFGE, there are no transmission losses and, therefore,  $TDL_{j,y}$  is zero. The 1.3 tCO<sub>2</sub>e/MWh default value from the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (more conservative option) was used to calculate the project emissions.

**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>• /A 10/ - /MR/;</li> <li>• /A 3/ - /CDM STANDARDS/;</li> <li>• /A 18/ to /A 28/ - /Calibration Documentation</li> <li>• /A 11/ - /ER's Spreadsheet/;</li> <li>• /A 16/ - /Eletrapaulo data-spreadsheets/;</li> <li>• /A 29/ - /Accuracy Documentation/;</li> <li>• /A 14/ - /PLC data-spreadsheets/.</li> </ul>				
<b>Findings</b>	<table border="1"> <tr> <td data-bbox="464 1704 539 1765"><input checked="" type="checkbox"/></td><td data-bbox="539 1704 1463 1765">No leakage emissions were to be considered (LE = 0).</td></tr> <tr> <td data-bbox="464 1765 539 2042"><input type="checkbox"/></td><td data-bbox="539 1765 1463 2042"> <p>The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see E.8.1 and E.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> </td></tr> </table>	<input checked="" type="checkbox"/>	No leakage emissions were to be considered (LE = 0).	<input type="checkbox"/>	<p>The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see E.8.1 and E.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>
<input checked="" type="checkbox"/>	No leakage emissions were to be considered (LE = 0).				
<input type="checkbox"/>	<p>The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see E.8.1 and E.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>				

	<input type="checkbox"/>	No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	<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>	<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 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> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /A 10/ - /MR/;</li> <li>• /A 3/ - /CDM STANDARDS/;</li> <li>• /A 18/ to /A 28/ - /Calibration Documentation</li> <li>• /A 11/ - /ER's Spreadsheet/;</li> <li>• /A 16/ - /Eletropaulo data-spreadsheets/;</li> <li>• /A 29/ - /Accuracy Documentation/;</li> <li>• /A 14/ - /PLC data-spreadsheets/.</li> </ul>	
<b>Findings</b>	<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: <b>CAR-4</b> - inconsistencies in exported electricity values. <b>CAR-5</b> - inconsistencies in measured LFG (FIR-100, FIR-700). <b>CAR-6</b> - inconsistencies in measured LFG (FIR-200, FIR-700).	
<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>Where corrections were required, revised ER calculation and MR were prepared by the PPs and presented to the verification team. All above summarized raised issues were addressed appropriately so that it can be confirmed that the final ER calculation is overall correct.</p> <p>All performed calculations for GHG emission reductions, as reported in the latest versions of the MR and ER calculation spreadsheet, were verified to be performed under full conformance with applicable requirements of the registered PDD, applied methodology and applicable methodological tools.</p>
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#### 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.
		Achieved emission reductions are correctly indicated as about ~29.7% lower than the comparable value of ex-ante estimation of emission reductions as per the registered PDD for the current monitoring period.

#### 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 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.

### 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.4 of the MR and the emission reduction calculation sheet /XLS/.										
<b>Findings</b>	<p><input checked="" type="checkbox"/> The MR in section E.4 includes a summary table of the ER breakdown</p> <p>a) ER before 01/01/2013 and</p> <p>b) ER from 01/01/2013 onwards</p> <p><input checked="" type="checkbox"/> The breakdown of the ERs before 01/01/2013 (during the first commitment period) and from 01/01/2013 onwards is as follows:</p> <p><input type="checkbox"/> The ER have completely been generated before 01/01/2013 (during the first commitment period)</p> <p><input type="checkbox"/> The ERs have completely been generated from 01/01/2013 onwards,</p> <p><input checked="" type="checkbox"/> The ERs have partly been generated before 01/01/2013 (during the first commitment period) and partly from 01/01/2013 onwards.</p> <p><input checked="" type="checkbox"/> The breakdown of the ERs is correct, considering the applicable guidance.</p> <table border="1"> <thead> <tr> <th></th> <th>before 01/01/2013</th> <th>from 01/01/2013</th> <th>Sum</th> </tr> </thead> <tbody> <tr> <td><b>Emission reductions[tCO<sub>2e</sub>]</b></td> <td>63,183</td> <td>763,844</td> <td>827,027 tCO<sub>2e</sub></td> </tr> </tbody> </table> <p><input type="checkbox"/> In this context the following CARs, CLs, FARs have been raised:</p>				before 01/01/2013	from 01/01/2013	Sum	<b>Emission reductions[tCO<sub>2e</sub>]</b>	63,183	763,844	827,027 tCO <sub>2e</sub>
	before 01/01/2013	from 01/01/2013	Sum								
<b>Emission reductions[tCO<sub>2e</sub>]</b>	63,183	763,844	827,027 tCO <sub>2e</sub>								
<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 calculations of GHG emission reductions or net anthropogenic GHG removals are in accordance with the project standard.</p>										

### E.9. Assessment of reported sustainable development co-benefits

<b>Means of verification</b>	<p><input checked="" type="checkbox"/> N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.</p> <p><input type="checkbox"/> The project participants have monitored the sustainable development co-benefits of the registered CDM project activity, and requested the DOE to verify them. The following sources of information have been used in this context:</p>	
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<b>Findings</b>	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	<input type="checkbox"/>	Therefore the DOE has assessed and confirms that: (a) The monitoring has been carried out in accordance with the document for monitoring sustainable development co-benefits, if such document was developed and published on the UNFCCC CDM website in accordance with the “CDM project standard for project activities”;  (b) The reported monitoring results correspond to the sustainable development co-benefits of the project activity as observed by the DOE.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
<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 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"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.

**E.10. Global stakeholder consultation**

<b>Means of verification</b>	<p>In accordance with the PCP the DOE has submitted the initial version of the monitoring report provided by the PP for this monitoring period to be published on the UNFCCC webpage.</p> <p>The monitoring report has been published on 01/03/2018.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>Monitoring Report version 05, dated 22/05/2018(/A 10/).</li> <li>UNFCCC.</li> </ul>	
<b>Findings</b>	<input checked="" type="checkbox"/>	No comments have been received on the published monitoring report for this monitoring period.
	<input type="checkbox"/>	Comments have been received and the DOE has concluded that comments are related to issues outside the CDM rules and requirements. Please refer to the list provided under Conclusion of this Section below for related information.
	<input type="checkbox"/>	<p>Comments have been received.</p> <p>The DOE has</p> <ul style="list-style-type: none"> <li>- requested further information from the submitters of the comments</li> <li>- informed the project participants of the comments received, and requested their feedback within a specified timeframe,</li> <li>- considered the input received and has assessed whether such comments are relevant to the CDM project activity,</li> <li>- acknowledged receipt of all submitted comments on the MR of the proposed CDM project activity,</li> <li>- assessed whether the comments are related to the CDM rules and requirements (if so related findings have been raised as per below),</li> <li>- used all possible means to determine the authenticity of the name and contact details of the individual or organization on whose behalf the comments have been submitted,</li> <li>- contacted the secretariat to make them publicly available (if only addressed to the DOE),</li> <li>- determined whether authentic and relevant comments in the global stakeholder consultation were taken into due account in the PDD of the proposed CDM project activity.</li> </ul>

	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised, i.e. as the DOE concludes that the comments are related to the CDM rules and requirements:		
<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.		
	As the DOE has concluded that comments are related to issues outside the CDM rules and requirements the comments and information gathered are listed as follows:			
	<b>Nbr.</b>	<b>Original comment received</b>	<b>Feedback by the PP</b>	<b>Statement by DOE</b>
	1			
	2			
	3			
	4			

## 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 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**

Biogás Energia Ambiental S.A. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 2nd periodic verification of the project: Bandeirantes Landfill Gas to Energy Project (BLFGE), with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to generation of electricity by combusting the landfill gas and to capture and flaring of landfill gas. This verification covers the period from 01/09/2012 to 22/12/2017 (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;
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately and identified delays (For details please refer to 0) were treated properly and in the most possible conservative manner (For details please refer to Appendix 5);
- 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 stated on the title page.

**SECTION H. Certification statement**

As a duly accredited DOE, TÜV NORD CERT confirms that the project Bandeirantes Landfill Gas to Energy Project (BLFGE), registered under UNFCCC-No.:0164, has achieved emission reductions in accordance with all applicable requirements for registered CDM project activities during the current monitoring period:

MP-No.: 2nd  
from: 01/09/2012  
to: 22/12/2017 (including both days)  
Emission reductions: 827,027 tCO<sub>2</sub>e

Rio de Janeiro, 29/05/2018



Vicente San Valero  
Team leader

## Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline emissions
BLFGE	Bandeirantes Landfill Gas to Energy Project
BM	Build Margin
CAR/s	Corrective action request/s
CDM	Clean development mechanism
CDM-EB	CDM Executive Board
CDM M&P	Modalities and procedures for a clean development mechanism
CDM PS	CDM Project Standard
CDM VVS	CDM Validation and Verification Standard
CERs	Certified emission reductions
CETESB	Companhia Ambiental do Estado de São Paulo (São Paulo state environment authority)
CH <sub>4</sub>	Methane
CL/s	Clarification request/s
CLZ	Corrective Action / Clarification Action
COP/MOP	Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol
DNA	Designated national authority
DOE	Designated operational entity
EF	Emission factor
EIA	Environmental impacts assessment
EPC	Engineering, procurement and construction
ER	Emission Reductions
FAR/s	Forward action request/s
GHG	Greenhouse gas
GSC	Global Stakeholder Consultation
GWP	Global Warming Potential
IM	Interview Memo
IPCC	Intergovernmental panel on climate change
KP	Kyoto Protocol of the UNFCCC
kW / kWh	Kilowatt / Kilowatt hour
LE	Leakage emissions
LF	Load Factor
LoA	Letter of approval
MR	Monitoring Report
MW / MWh	Megawatt / Megawatt hour
OM	Operating Margin
PDD	Project design document
PE	Project emissions
PP	Project participant
RfR	Request for Registration
tCO <sub>2</sub> e	Tonnes of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
XLS	Emission Reduction Calculation Spread Sheet

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

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2019-07-01
JI	Senior Assessor Technical Reviewer	2019-07-01
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2019-07-01

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal Energy Generation
1.2	Renewables
4.1	Cement and lime production
4.2	Paper
5.1	Chemical Industry
5.2	Caprolactam, nitric and adipic acid
8.1	Mining/mineral production
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
11.1	Emissions of fluorinated gases
11.2	Refrigerant gas production
12.1	Chemical industry
13.1	Solid waste and wastewater

003 - Rev. 10, Date: 2016-07-01

003\_S01-VA060-F20\_2016-07-01\_rev10.doc 001-VA060-F20 rev3 / 2012-10-25

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2020-09-07
VCS / ISO 14064-2	Lead Assessor	2020-09-07

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
2.1	Energy distribution
13.1	Solid waste and wastewater

368 - Rev. 0, Date: 2017-09-08

368\_S01-VA060-F20\_2017-09-08\_rev0 001-VA060-F20 rev3 / 2012-10-25

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2020-02-02
VCS	Lead Assessor	2020-02-02

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies

047 - Rev.4, Date: 2017-07-04

047\_S01-VA060-F20\_2017-07-04\_rev4 001-VA060-F20 rev3 / 2012-10-25

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
A 1	UNFCCC	ACM0001 - "Consolidated baseline and monitoring methodology for landfill gas project activities", version 11, dated 28/05/2009.	<a href="http://cdm.unfccc.int/methodologies/PAmethodologies/approved">http://cdm.unfccc.int/methodologies/PAmethodologies/approved</a>	Others
A 2	UNFCCC	<b>CDM TOOLS</b> * "Tool to calculate the emission factor for an electricity system", version 02.2.1, dated 29/09/2011. * "Tool for the demonstration and assessment of additionality", version 06.0.0, dated 25/11/2011; * "Emissions from solid waste disposal sites", version 06.0.0, dated 25/11/2011 ; * "Tool to calculate project or leakage CO <sub>2</sub> emissions from fossil fuel combustion", version 02, dated 02/08/2008; * "Tool to determine project emissions from flaring gases containing methane", version 01, dated 15/12/2006. * "Tool to calculate baseline, project, and/or leakage emissions from electricity consumption", version 1, dated 16/05/2008.	<a href="http://cdm.unfccc.int/Reference/tools/index.html">http://cdm.unfccc.int/Reference/tools/index.html</a>	Others
A 3	UNFCCC	<b>CDM STANDARDS</b> * CDM Validation and Verification Standard (CDM VVS), version 09.0 dated 20/02/2015. * CDM Validation and Verification Standard (CDM VVS), version 01.0 dated 03/03/2017.	<a href="http://cdm.unfccc.int/Reference/Standards/index.html">http://cdm.unfccc.int/Reference/Standards/index.html</a>	Others
A 4	UNFCCC	"Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities" (Version 04.0).  "Standard for Sampling and Surveys for CDM Project Activities and Programme Activities" (version 7.0).	<a href="https://cdm.unfccc.int/Reference/Guidance/Guidelines/index.html">https://cdm.unfccc.int/Reference/Guidance/Guidelines/index.html</a>  <a href="http://cdm.unfccc.int/Reference/Standards/index.html">http://cdm.unfccc.int/Reference/Standards/index.html</a>	Others
A 5	UNFCCC	CDM Executive Board: CDM-MR-FORM: Monitoring report form for CDM project activity, version 06.0, dated 07/06/2017 ( <i>Attachment: "Instructions for filling out the monitoring report form for CDM project activities"</i> ).	<a href="https://cdm.unfccc.int/Reference/PDDs_Forms/index.html">https://cdm.unfccc.int/Reference/PDDs_Forms/index.html</a>	Others
A 6	IPCC	* Fourth Assessment Report (AR4), Climate Change 2007 – Default value, Global warming potential of CH <sub>4</sub> (GWP <sub>CH4</sub> ) = 25tCO <sub>2</sub> e/t CH <sub>4</sub> .	<a href="http://www.ipcc">www.ipcc</a>	Others



		* 2006 IPCC Guidelines for National Greenhouse Gas Inventories – Default values.	nggip.iges.or.jp	
A 7	UNFCCC	* Registered CDM-PDD for project activity “Bandeirantes Landfill Gas to Energy Project (BLFGE)” (2 <sup>nd</sup> Crediting Period) in Brazil, Version 03, dated 01/03/2012.		Others
A 8	UNFCCC	* RINA: Validation opinion for renewal of the crediting period report N° 2010-BQ-06-MD for project activity “Bandeirantes Landfill Gas to Energy Project (BLFGE)” in Brazil, Version 1.2, dated 03/04/2012.		Others
A 9	UNFCCC	* TÜV SÜD: Verification and Certification Report, report N° 600501114 for project activity “Bandeirantes Landfill Gas to Energy Project (BLFGE)” in Brazil, Version 03, dated 12/02/2014.		Others
A 10	Biogás Energia Ambiental S.A.	<b>Monitoring Report/s</b> * Bandeirantes Landfill Gas to Energy Project (BLFGE): Monitoring Report version 01, dated 17/01/2018 – published on 01/03/2018 (842,000 tCO <sub>2</sub> e). * Bandeirantes Landfill Gas to Energy Project (BLFGE): Monitoring Report version 02, dated 06/04/2018 (830,038 tCO <sub>2</sub> e). * Bandeirantes Landfill Gas to Energy Project (BLFGE): Monitoring Report version 03, dated 20/04/2018 (815,360 tCO <sub>2</sub> e). *Bandeirantes Landfill Gas to Energy Project (BLFGE): Monitoring Report version 04, dated 09/05/2018(826,825 tCO <sub>2</sub> e) *Bandeirantes Landfill Gas to Energy Project (BLFGE): Monitoring Report version 05, dated 22/05/2018 (827,027 tCO <sub>2</sub> e).		Project participants
A 11	EQAO	<b>ER's Spreadsheet/s</b> * ER's Spreadsheet Calculation: “20180117_Bandeirantes_v.1_CERs.xlsx”, dated 17/01/2018. * ER's Spreadsheet Calculation: “20180406_Bandeirantes_v.2_CERs”, dated 06/04/2018. * ER's Spreadsheet Calculation: “20180420_Bandeirantes_v.3_CERs”, dated 20/04/2018. * ER's Spreadsheet Calculation: “20180509_Bandeirantes_v.4_CERs”, dated 09/05/2018. * ER's Spreadsheet Calculation: “20180522_Bandeirantes_v.5_CERs”, dated 22/05/2018.		Project participants
A 12	EQAO	<b>Calibration Summary Spreadsheet/s</b> * Calibration summary: “BANDEIRANTES_Calibration Summary.xlsx”, dated 17/01/2018. * Calibration summary: “BANDEIRANTES_Calibration Summary_v.2”, dated 09/05/2018. * Calibration summary: “BANDEIRANTES_Calibration Summary_v.3”, dated 22/05/2018.		Project participants
A 13	CETESB	Environmental operational licence, N° 29005600, dated 19/06/2013, valid until 19/06/2018.		Project participants
A 14	Biogás Energia Ambiental S.A.	<b>PLC data-spreadsheets:</b> gas flow, methane content, LFG temperature, flares temperature data, electricity consumption-diesel generator (operation hours).  <b>Operation diary:</b> “LivroDiário de Operação da Planta de Gás - UTE BAND.PDF” (daily operation events, including possible replacement of instruments).		Project participants
A 15	Brazilian DNA	Brazilian DNA publication of annual Emission Factors for the Brazilian electricity grid, Website, accessed on 20/02/2018.	<a href="http://www.mct.gov.br/index.php/cont">http://www.mct.gov.br/index.php/cont</a>	Others

			ent/view/ 74689.ht ml	
A 16	Eletropau lo	<p><b>Eletropaulo data-spreadsheets:</b> electricity production indicating electricity delivered to the grid.</p> <p>Selected spreadsheets:</p> <p>“UTE_BANDEIRANTES_202616913_P_2015_12_CONSUMO.xls”</p> <p>“UTE_BANDEIRANTES_202616913_P_2016_02_CONSUMO.xls”</p> <p>“UTE_BANDEIRANTES_202616913_P_2016_04_CONSUMO.xls”</p> <p>“UTE_BANDEIRANTES_202616913_P_2016_07_CONSUMO.xls”</p> <p>“UTE_BANDEIRANTES_202616913_P_2016_08_CONSUMO.xls”</p> <p>“UTE_BANDEIRANTES_202616913_P_2016_10_CONSUMO.xls”</p> <p>“UTE_BANDEIRANTES_202616913_P_2016_12_CONSUMO.xls”</p> <p>“UTE_BANDEIRANTES_202616913_P_2017_02_CONSUMO.xls”</p> <p>“UTE_BANDEIRANTES_202616913_P_2017_07_CONSUMO.xls”</p> <p>“UTE_BANDEIRANTES_202616913_P_2017_08_CONSUMO.xls”</p> <p>“UTE_BANDEIRANTES_202616913_P_2017_10_CONSUMO.xls”</p> <p>“UTE_BANDEIRANTES_202616913_P_2017_12_CONSUMO.xls”</p>		Others
A 17		<p><b>Plant equipment technical specifications:</b></p> <p>“AERZEN_FOLHA DE DADOS_BLOWER.pdf”;</p> <p>“CATERPILLAR_Gas Engine Technical Data”;</p> <p>“HOF GAS Efficiency 2500 lay-out”;</p> <p>“HOFSTETTER_TEMPERATURA FLARES”;</p> <p>“HOFSTETTER_FOLHA DE DADOS_FLARES.pdf”;</p> <p>“HOFSTETTER_FOLHA DE DADOS_MINI BLOWER”.</p>		Others
A 18	Endress- Hauser / FCI / IPT	<p><b><u>CALIBRATION CERTIFICATES- FIR100</u></b></p> <p><b>Flow meter Endress-Hauser, model t-mass 65, serial #9407D902000 and Flow meter FCI, model ST51, serial # 341992-A:</b> files “007 FIR 100_ENDRESS+HAUSER_48143544.pdf”, “2011 FIR100_FCI(HIRSA)_H15123 2.pdf”, “2016 FIR100_IPT_151 871-101.pdf”.</p> <p><i>(For other information like calibration dates, errors, etc. - please refer to 0)</i></p>		Others
A 19	IPT / VISOME S / SALCAS / ABSI	<p><b><u>CALIBRATION CERTIFICATES- FIR200</u></b></p> <p><b>Flow Meter Incontrol, model VTGEX200, serial # VG15239:</b> files “2009 FIR200_IPT_93 635-101.pdf”, “2009 FIR200_IPT_95 562-101.pdf”, “2014 FIR200_IPT_141 786-101.pdf”.</p> <p><b>Temperature transmitter ASTA, model PT-100, serial # S377815:</b> files “2014 FIR200_VISOMES_LV20318-14-R0.pdf”, “2009 FIR200_SALCAS_32281-2009.pdf”.</p> <p><b>Pressure transmitter SMAR, model M2, serial # L454793:</b> files “2014 FIR200_VISOMES_LV21088-14-R0.pdf”, “2009 FIR200_ABSI_CAL 62 106 - 09.pdf”.</p> <p><i>(For other information like calibration dates, errors, etc. - please refer to 0)</i></p>		Others

A 20	FCI / IPT	<b><u>CALIBRATION CERTIFICATES- FIR700</u></b> <b>Flow Meter Incontrol, model ST51, serial # 328849:</b> files “2016 FIR700_IPT_150 011-101.pdf”, “2010 FIR700_FCI_C050885.pdf”. <i>(For other information like calibration dates, errors, etc. - please refer to 0)</i>		Others
A 21	INCONT ROL / IPT / VISOME S / SALCAS / RBC	<b><u>CALIBRATION CERTIFICATES POWER HOUSE- FIR300</u></b> <b>Flow Meter Incontrol, model VTGEX200, serial # VG083B6:</b> files “2006 FIR300_INCONTROL_8218-06.pdf”, “2011 FIR300_IPT_113 239-101.pdf”. <b>Temperature transmitter ASTA, model PT-100, serial # S502986:</b> files “2014 FIR300_VISOMES_LV10559-14-R0.pdf”, “2009 FIR300_SALCAS_32282-2009.pdf”. <b>Pressure transmitter SMAR, model LD291, serial # 33007-06:</b> files “2014 FIR300_VISOMES_LV11650-14-R0.pdf”, “2009 FIR_300_RBC_CAL 62680-09.pdf”. <i>(For other information like calibration dates, errors, etc. - please refer to 0)</i>		Others
A 22	INCONT ROL / IPT / VISOME S / SALCAS	<b><u>CALIBRATION CERTIFICATES POWER HOUSE- FIR400</u></b> <b>Flow Meter Incontrol, model VTGEX200, serial # VG084B6:</b> files “2006 FIR400_INCONTROL_8218-06.pdf”, “2011 FIR400_IPT_108 799-101.pdf”. <b>Temperature transmitter ASTA, model PT-100, serial # S502987:</b> file “2014 FIR400_VISOMES_LV07751-14-R0.pdf”, “2009 FIR400_SALCAS_32283-2009.pdf”. <b>Pressure transmitter SMAR, model LD291, serial # L42237:</b> file “2014 FIR400_VISOMES_LV11651-14-R0.pdf”, “2009 FIR 400_INCONTROL_CAL 62105-09 RCB 02.pdf”. <i>(For other information like calibration dates, errors, etc. - please refer to 0)</i>		Others
A 23	INCONT ROL / IPT / VISOME S / SALCAS / ABSI	<b><u>CALIBRATION CERTIFICATES POWER HOUSE- FIR500</u></b> <b>Flow Meter Incontrol, model VTGEX200, serial # VG086B6:</b> files “2006 FIR500_INCONTROL_8218-06.pdf”, “2011 FIR500_IPT_114 043-101.pdf”, “2017 FIR500_IPT_156 601-101.pdf”. <b>Temperature transmitter ASTA, model PT-100, serial # S502988:</b> files “2014 FIR500_VISOMES_LV07752-14-R0.pdf”, “2009 FIR 500_SALCAS_32284-2009.pdf”. <b>Pressure transmitter SMAR, model LD291, serial # 33006-06:</b> files “2014 FIR500_VISOMES_LV05793-14-R0.pdf”, “2009 FIR500_ABSI_CAL 63708-09.pdf”. <i>(For other information like calibration dates, errors, etc. - please refer to 0)</i>		Others
A 24	INCONT ROL / IPT / VISOME S / SALCAS / ABSI	<b><u>CALIBRATION CERTIFICATES POWER HOUSE- FIR600</u></b> <b>Flow Meter Incontrol, model VTGEX200, serial # VG085B6:</b> files “2006 FIR600_INCONTROL_8218-06.pdf”, “2011 FIR600_IPT_111 582-101.pdf”, “2016 FIR600_IPT_156 558-101.pdf”. <b>Temperature transmitter ASTA, model PT-100, serial # S502989:</b> files “2014 FIR600_VISOMES_LV10558-14-R0.pdf”, “2009 FIR600_SALCAS_32285-2009.pdf”. <b>Pressure transmitter SMAR, model LD291, serial # 33005-06:</b> files “2014 FIR600_VISOMES_LV05792-14-R0.pdf”, “2009 FIR600_ABSI_CAL 62479-09.pdf”. <i>(For other information like calibration dates, errors, etc. - please refer to 0)</i>		Others

A 25	AES Eletropaulo	<b>CALIBRATION CERTIFICATES- ELECTRICITY METERS SUBSTATION</b> <b>Landis gyr, model Saga 1000, serial #1168593 and 1168594:</b> file “Rel de calibração_UTE Bandeirantes.pdf”. <i>(For other information like calibration dates, errors, etc. - please refer to 0)</i>		Others
A 26	Biogás Energia Ambiental S.A. /  <			

			LV 28014-13-R0	VISOMES	"2014 F200_VISOMES_LV2814-13-R0.pdf"			
			LV 27063-14-R0	VISOMES	"2014 F200_VISOMES_LV27063-14-R0.pdf"			
		TERMOSHAW	R0110/2014	PHARMA	"2014 F200_PHARMA_R0110-2014.pdf"			
			LV 30762-15-R0	VISOMES	"2015 F200_VISOMES_LV30762-15-R0.pdf"			
			LV 33762-16/R0	VISOMES	"2016 F200_VISOMES_LV33762-16-R0.pdf"			
		TERMOSHAW	LT 182 411	ESCALA	"2017 F200_ESCALA_LT 182 411.pdf"			
A 29		<b>ACCURACY DOCUMENTATION</b>						
		Type	Equipme nt	Model	Manufactu rer	Accura cy (%)	Reference	
		Flow	PT-100	t-mass 65 l DN175 / 7" (177.75mm)	Endress + Hauser	1.5	Technical Information / Proline t-mass 65F, 65I / Thermal mass flow meter	
		Flow	PT-100	ST51-1F33FM 00	FCI	2.5	ST51 MASS FLOW METER - Installation and Operation Guide	
		Flow	FIR700					
		Flow	FIR200	VTG EX200	Incontrol	1	- INCONTROL Operation and Installation Manual for VTG turbine gas flow meters - Calibration Record	
		Flow	FIR300					
		Flow	FIR400					
		Flow	FIR500					
		Flow	FIR600					
		Pressure	FIR200	LD291	SMAR	0.2	- SMAR Manual Instructions for Installation and Operation - SMAR Calibration Record LD291	
		Pressure	FIR300					
		Pressure	FIR400					
		Pressure	FIR500					
		Pressure	FIR600					
		Temperat ure	FIR200	PT-100	ASTA	0.6471	- ASTA Certification Declaration for Temperature Transmitter - Salcas Certificates	
		Temperat ure	FIR300			0.5993		
		Temperat ure	FIR400			0.1775		
		Temperat ure	FIR500			0.8717		
		Temperat ure	FIR600			0.1998		
		Thermoco uple	F100	-	Termoshaw / Engro/ Jumo	N/A	JUMO construction and application of thermocouples	
		Thermoco uple	F200					
		CH4	Analyzer	Binos 100M	Rosemount - NUK	1	Rosemount BINOS 100 M Operation Manual (page 133), detection limit	
		Electricity	SE	Saga 1000	Landis gyr	0.2	SAGA1000 User Manual Guide	
		Electricity	landfill	CM4000	Schneider Electronic / Power Logic		Circuit Monitor Series 4000 - Functions and characteristics	

A 30	Biogás Energia Ambiental S.A.	<b><u>QA/QC BLFGE Procedures</u></b> PO-001: Procedure about re-starting the plant after an electricity breakdown; PO-002: Calibration of methane analyser; PO-003: Calibration of valve (flare); PO-004: Service orders and maintenance; PO-005: Procedure of monitoring parameters (including calibration plan); PO-006: Procedure about internal monitoring of Bandeirantes; PO-007: Procedure about workers control; PO-008: Procedure for the elaboration of the monthly operational report; PO-009: Procedure in emergency situations; PO-010: Procedure for data back-up of the supervisory system; PO-011: Procedure for manual data collection; PO-012: Instruction for Refuelling the Diesel Device; PO-013: Identification of legal and other requirements; PO-014: Administrative Procedure.		Project participan ts
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## Appendix 4. Clarification requests, corrective action requests and forward action requests

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

<b>FAR ID</b>	xx	<b>Section no.</b>	E.2	<b>Date:</b> DD/MM/YYYY
<b>Description of FAR</b>				
<b>Project participant response</b>				<b>Date:</b> DD/MM/YYYY
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date:</b> DD/MM/YYYY
There are no remaining FARs from validation and/or previous verifications.				

Table 4. CL from this verification

CL ID	CL-1	Section no.	E.6.1	Date:29/03/2018
<b>Description of CL</b>				
Not all parameters fixed ex-ante (registered PDD) are presented in section B.1 of the Monitoring Report version 1.				
<b>Project participant response</b>				<b>Date:09/04/2018</b>
In fact, version 1 of the Monitoring Report presented only parameters used in for ER calculations. Then, the section D.1 of the Monitoring Report was revised to consider all fixed ex-ante parameters established in the registered PDD. Please refer to the second version of the document.				
<b>Documentation provided by project participant</b>				
Monitoring Report, version 2, 06/04/2018.				
<b>DOE assessment</b>				<b>Date:04/05/2018</b>
MR has been revised accordingly. This CL is closed.				

CL ID	CL-2	Section no.	E.7	Date: 29/03/2018
<b>Description of CL</b>				
PP is requested to provide: 1- evidences of weekly calibrations of the gas analyser and certificates of the standard gas cylinders; 2- all of the certificates listed in the "BANDEIRANTES_Calibration Summary.xlsx" spreadsheet; 3- evidences of the accuracy and/or class of all instruments.				
<b>Project participant response</b>				<b>Date:09/04/2018</b>
Documents required are attached to this response. <b>2nd PP Response - 09/05/2018:</b> Documented evidence regarding accuracy class of instruments is attached to this response.				
<b>Documentation provided by project participant</b>				
<ul style="list-style-type: none"> <li>- Weekly calibrations of the gas analyser and certificates of the standard gas cylinders;</li> <li>- Calibration certificates listed in the "BANDEIRANTES_Calibration Summary.xlsx" spreadsheet;</li> <li>- Documented evidence regarding accuracy and/or class of all instruments.</li> </ul>				
<b>DOE assessment</b>				<b>Date:04/05/2018</b>
<b>2nd DOE Request - 04/05/2018:</b> Not all evidences of accuracy and/or class of all instruments (technical specifications, manuals, etc) were provided. This CL remains open. <b>DOE assessment - 10/05/2018:</b> All evidences of accuracy and/or class of all instruments (technical specifications, manuals, etc) were provided (/A 29/). This CL is closed.				



Table 5. CAR from this verification

CAR ID	CAR-1	Section no.	E.8	Date:29/03/2018
<b>Description of CAR</b>				
<p>"Bandeirantes ER" spreadsheet / worksheet "El. Grid emission factor" presents OM average values for 2012 and 2017 that are not in accordance with the values obtained in the spreadsheets (Despacho-YYYY.xlsx) from the Brazilian DNA/MCTIC. Furthermore, PP is requested to explain/justify the 0.1581 tCO<sub>2</sub>/MWh BM-2017 value, as the BM-2017 was not published yet by the Brazilian DNA/MCTIC.</p>				
<b>Project participant response</b>				<b>Date:06/04/2018</b>
<p>The CO<sub>2</sub> BM and OM emission factors considered in the project activity are calculated and publicly available by the Brazilian DNA. However, CO<sub>2</sub> BM EF is not public available for 2017 year and, therefore, data used for this year is based on 2016 year (the latest data available).</p> <p>Also, it is the most conservative value during the monitored period and, therefore, emission reductions are not over estimated. This information was also included in the revised version of the Monitoring Report.</p> <p>The 2012 CO<sub>2</sub> OM emission factor was corrected according to the Brazilian DNA's information. Please refer to the revised version of the Monitoring Report and ER spreadsheet.</p>				
<b>Documentation provided by project participant</b>				
<ul style="list-style-type: none"> <li>- Monitoring Report, version 2, 06/04/2018;</li> <li>- ER spreadsheet, version 2, 06/04/2018.</li> </ul>				
<b>DOE assessment</b>				<b>Date:30/04/2018</b>
<p>Average values for 2012 and 2017 were corrected as per information provided by the Brazilian DNA and BM most conservative value was used.</p> <p>This CAR is closed.</p>				

CAR ID	CAR-2	Section no.	E.7	Date: 29/03/2018
<b>Description of CAR</b>				
<p>"BANDEIRANTES_Calibration Summary.xlsx" spreadsheet presents "Max. Accuracy (%)" and "Equivalent Error" values for all instruments ("Equivalent Error" values are used in the "Bandeirantes ER" spreadsheet / worksheet "Monitored Data" and 'named' as "<i>Error equip. applied to uncovered calibration periods</i>", to calculate corrected values. The following inconsistencies were found:</p> <ul style="list-style-type: none"> <li>- "BANDEIRANTES_Calibration Summary.xlsx" spreadsheet presents a "Max. Accuracy (%)" for the Endress-Hauser t-mass 65 equal to 0.7020 while literature from manufacturer mentions an accuracy of <math>\pm 1.5</math> % o.r. (10 to 100 % o.f.s.);</li> <li>- "BANDEIRANTES_Calibration Summary.xlsx" spreadsheet presents a "Max. Accuracy (%)" for the ST51 Flow Meter equal to -0,2725 while literature from manufacturer mentions an accuracy of <math>\pm 1</math> % of reading;</li> </ul> <p>Calculations of corrected values shall be reviewed applying maximum permissible error or the error identified in the delayed calibration test, if the error is beyond the maximum permissible error of the measuring equipment and evidences to backup such applied error values provided.</p>				
<b>Project participant response</b>				<b>Date: 06/04/2018</b>
<p>Actually, 0.7020 is not the maximum accuracy for the Endress-Hauser t-mass 65, but the average accuracy among test results. The same occurred for all equipment accuracy presented in the Calibration Summary spreadsheet. Therefore, calibration spreadsheet was revised to consider procedures established in §369 of the CDM Validation and Verification Standard for Project Activities. The equivalent error among flow meters, analysers, pressure and temperature transmitters was applied based on equipment accuracy and test results, whichever is higher according to the Standard.</p> <p>Therefore, ER spreadsheet and Monitoring Report were also revised to apply the resulted error that shall be applied in the uncovered calibration periods. Please refer to the second version of the Monitoring Report and ER spreadsheet. Also refer to the Project Participant response in CAR 3.</p> <p><b>2nd PP Response - 09/05/2018:</b></p> <p>Documented evidence regarding accuracy class of instruments is attached to this response. Information regarding calculation of equivalent errors was included in the MR.</p>				
<b>Documentation provided by project participant</b>				
<ul style="list-style-type: none"> <li>- Monitoring Report, version 2, 06/04/2018;</li> <li>- ER spreadsheet, version 2, 06/04/2018;</li> <li>- Calibration summary spreadsheet.</li> </ul>				
<b>DOE assessment</b>				<b>Date: 30/04/2018</b>
<b>2nd DOE Request - 04/05/2018:</b>				

Based in literature from manufacturers found in the internet and Verification team experience it is confirmed that all equivalent errors applied are considerable higher than usual accuracy of these type of equipments, (flow meters, pressure/temperature sensors, electricity meters, etc) but not all evidences of accuracy and/or class of all instruments (technical specifications, manuals, etc) were provided (Please refer to CL2). Furthermore PP is also requested to mention at MR how the equivalent errors were calculated.

This CAR remains open.

**DOE assessment - 10/05/2018:**

All evidences of accuracy and/or class of all instruments (technical specifications, manuals, etc) were provided (/A 29/). MR is now mentioning how the equivalent errors were calculated.

This CAR is closed.

CAR ID	CAR-3	Section no.	E.7	Date: 29/03/2018
<b>Description of CAR</b>				
MR is not addressing the delay or lack of calibration in various periods (please refer to VVS section 11.4.5. Compliance with the calibration frequency requirements for measuring instruments and Appendix: Calibration) – this approach (impact assessment/possible errors by delays in calibration) should also be clearly identified in the “Bandeirantes ER” spreadsheet / worksheet “Monitored Data”.				
<b>Project participant response</b>				<b>Date: 06/04/2018</b>
The ER spreadsheet (version 1) considered delay in calibrations based on average of test results. However, ER calculations were revised to apply procedures established in §369 of the CDM Validation and Verification Standard for Project Activities. The equivalent error among flow meters, analysers, pressure and temperature transmitters was applied based on equipment accuracy and test results, whichever is higher according to the Standard. Conservatively, discounts were applied to the whole month not covered by calibration, e.g. FIR300 was not calibrated from 27/03/2014 to 03/04/2014, then discount was applied from 01/03/2014 to 30/04/2014. This information presented above included in section E.1 of the Monitoring Report, as well as detailed description regarding uncovered calibration periods. Tables of section D.2 were also revised to include accuracy of equipment. Please refer to the second version of the Monitoring Report and ER spreadsheet.				
<b>2nd PP Response - 09/05/2018:</b>				
The only missing calibration period for discounts application was from 15/07/2017 to 22/12/2017 regarding electricity meters from substation. It is important mentioning that, although there is a missing period from electricity meters located at Biogas plant, electricity data is not used for emission reduction calculation. Data used for emission reduction is from the local power utility, which is the official source of data and used for invoice purposes. Please refer to the revised version of the MR and ER spreadsheet.				
<b>Documentation provided by project participant</b>				
<ul style="list-style-type: none"> <li>- Monitoring Report, version 2, 06/04/2018;</li> <li>- ER spreadsheet, version 2, 06/04/2018.</li> </ul>				
<b>DOE assessment</b>				<b>Date: 30/04/2018</b>
<b>2nd DOE Request - 04/05/2018:</b>				
MR is now addressing the delay or lack of calibration but some discrepancies and missing period (for instance, substation meters) were still found.				
This CAR remains open.				
<b>DOE assessment - 10/05/2018:</b>				
Documentation provided by PP: Monitoring Report version 04 dated 09/05/2018; ER spreadsheet “20180509_Bandeirantes_v.4_CERs”, dated 09/05/2018 and Calibration summary spreadsheet “BANDEIRANTES_Calibration Summary_v.2”, dated 09/05/2018.				
All discount periods and equivalent errors are now correctly applied at ER spreadsheet.				
This CAR is closed.				

CAR ID	CAR-4	Section no.	E.8	Date: 09/04/2018
<b>Description of CAR</b>				
While crosschecking data of “Bandeirantes ER” spreadsheet / worksheet “Monitored Data” against SGE Eletropaulo spreadsheets (“UTE_BANDEIRANTES_202616913_P_YYYY_MM_CONSUMO.xlsx”), the following inconsistencies were found:				
YEAR	MONTH	worksheet “Monitored Data” - Electricity Exported (MWh)	Eletropaulo worksheets / readings (MWh)	
2016	7	2,226.480	2,226.105	
2016	10	2,116.834	2,116.584	
2017	2	2,262.601	2,262.624	

2017	8	2,182.999	2,183.015
<b>Project participant response</b>			<b>Date:</b> 20/04/2018
<p>In fact, discrepancies in electricity data were found in 07/2016, 10/2016, 02/2017 and 08/2017 due to post adjustments made by Eletropaulo. BiogásEnergiaAmbiental S.A. is currently evaluating an internal procedure to recheck data from Eletropaulo (the local concessionary's system) in order to avoid discrepancies from post adjustments.</p> <p>The Monitoring Report and ER spreadsheet were revised to consider updated data from the Eletropaulo' s system. Please refer to the revised version of both documents.</p>			
<b>Documentation provided by project participant</b>			
<ul style="list-style-type: none"> <li>- Monitoring Report, version 3, 20/04/2018;</li> <li>- ER spreadsheet, version 3, 20/04/2018.</li> </ul>			
<b>DOE assessment</b>			<b>Date:</b> 30/04/2018
<p>Data from Eletropaulo spreadsheets is used in the "Bandeirantes ER" version 3 spreadsheet and the Verification team confirms that Eletropaulo' s values (substation meters) are always lower than values presented in previous "Bandeirantes ER" version 2 spreadsheet.</p> <p>This CAR is closed.</p>			

<b>CAR ID</b>	<b>CAR 5</b>	<b>Section no.</b>	<b>E.8</b>	<b>Date:</b> 09/04/2018																																				
<b>Description of CAR</b>																																								
<p>While crosschecking data of "Bandeirantes ER" spreadsheet / worksheet "Monitored Data" against BIOGÁS spreadsheets ("REL_OVW_1Hor MM_YY.XLS"), the following inconsistencies were found:</p>																																								
<table border="1"> <thead> <tr> <th>LFG measured (Nm³)</th> <th>FIR-100</th> <th>FIR-700</th> <th>Total LFG sent to the power house (Nm³)</th> </tr> </thead> <tbody> <tr> <td>Bandeirantes ER spreadsheet / worksheet "Monitored Data"</td> <td>1,010,603.00</td> <td>430,477.00</td> <td>0.00</td> </tr> <tr> <td>REL_OVW_1Hor 05_14.XLS</td> <td>1,010,617.11</td> <td>934,019.04</td> <td>0.00</td> </tr> <tr> <td>Bandeirantes ER spreadsheet / worksheet "Monitored Data"</td> <td>1,090,749.00</td> <td>538,427.00</td> <td>220,774.44</td> </tr> <tr> <td>REL_OVW_1Hor 09_15.XLS</td> <td>1,090,763.13</td> <td>1,046,106.08</td> <td>635.00</td> </tr> <tr> <td>Bandeirantes ER spreadsheet / worksheet "Monitored Data"</td> <td>1,802,428.00</td> <td>897.00</td> <td>1,654,563.00</td> </tr> <tr> <td>REL_OVW_1Hor 01_16.XLS</td> <td>1,802,445.84</td> <td>8,874.92</td> <td>1,654,563.00</td> </tr> <tr> <td>Bandeirantes ER spreadsheet</td> <td>1,870,910.00</td> <td>36,962.00</td> <td>2,072,719.00</td> </tr> <tr> <td>REL_OVW_1Hor 02_17.XLS</td> <td>1,803,610.38</td> <td>40,488.30</td> <td>1,998,200.00</td> </tr> </tbody> </table>					LFG measured (Nm³)	FIR-100	FIR-700	Total LFG sent to the power house (Nm³)	Bandeirantes ER spreadsheet / worksheet "Monitored Data"	1,010,603.00	430,477.00	0.00	REL_OVW_1Hor 05_14.XLS	1,010,617.11	934,019.04	0.00	Bandeirantes ER spreadsheet / worksheet "Monitored Data"	1,090,749.00	538,427.00	220,774.44	REL_OVW_1Hor 09_15.XLS	1,090,763.13	1,046,106.08	635.00	Bandeirantes ER spreadsheet / worksheet "Monitored Data"	1,802,428.00	897.00	1,654,563.00	REL_OVW_1Hor 01_16.XLS	1,802,445.84	8,874.92	1,654,563.00	Bandeirantes ER spreadsheet	1,870,910.00	36,962.00	2,072,719.00	REL_OVW_1Hor 02_17.XLS	1,803,610.38	40,488.30	1,998,200.00
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Bandeirantes ER spreadsheet / worksheet "Monitored Data"	1,802,428.00	897.00	1,654,563.00																																					
REL_OVW_1Hor 01_16.XLS	1,802,445.84	8,874.92	1,654,563.00																																					
Bandeirantes ER spreadsheet	1,870,910.00	36,962.00	2,072,719.00																																					
REL_OVW_1Hor 02_17.XLS	1,803,610.38	40,488.30	1,998,200.00																																					
<b>Project participant response</b>				<b>Date:</b> 20/04/2018																																				
<p>Data instantaneously generated was compared to data from the PLC system, which is the same and both considered eight decimal places at least. However, conservatively, data for ER calculation does not considered decimal places, but values rounded down. Therefore, hourly data from the system is always little higher than data considered for the ER calculation.</p>																																								
<table border="1"> <thead> <tr> <th>Equipment</th> <th>Date</th> <th>Hourly data</th> <th>ER calculation</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>REL_OVW_1Hor 09_15</td> <td>09 BLFGE_-Data_19th - Setembro.xls</td> </tr> <tr> <td>FIR100</td> <td>01/09/2015</td> <td>33,474.05859375</td> <td>33,474</td> </tr> <tr> <td>FIR100</td> <td>04/09/2015</td> <td>38,471.66015625</td> <td>38,471</td> </tr> <tr> <td>FIR100</td> <td>06/09/2015</td> <td>35,845.72265625</td> <td>35,845</td> </tr> </tbody> </table>					Equipment	Date	Hourly data	ER calculation			REL_OVW_1Hor 09_15	09 BLFGE_-Data_19th - Setembro.xls	FIR100	01/09/2015	33,474.05859375	33,474	FIR100	04/09/2015	38,471.66015625	38,471	FIR100	06/09/2015	35,845.72265625	35,845																
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FIR100	06/09/2015	35,845.72265625	35,845																																					
<p>Besides, hourly data from flares presents data instantaneously generated in the system, however, data from the PLC system, which is used for ER calculation purposes, considers a discount of hours in which temperature of the exhausted gas is lower than 900°C. While comparing hourly data ("REL_OVW_1Hor MONTH_YEAR.xls") with hourly/daily data from the PLC ("BLFGE_-PLC_MONTH_YEAR.xls", see day 01 sheet, for example), quantity of gas is the same. However, in columns "N" and "O" of PLC spreadsheet, gas out of manufacturer's specification is discounted when temperature is lower than 900°C.</p> <p>According to "Tool to determine project emissions from flaring gases containing methane" (version 1) considered in the registered PDD, while applying the 90% default value for enclosed flares:</p> <p>"Continuous monitoring of compliance with manufacturer's specification of flare (temperature, flow rate of residual gas at the inlet of the flare) must be performed. <u>If in a specific hour any of the parameters are out of the limit of manufacturer's specifications, a 50% default value for the flare efficiency should be used for the calculations for this specific hour</u>".</p>																																								

According to the registered PDD, the operation of the flare is out of the specified conditions if the temperature drops below 900°C or above 1,350°C. Then, for hours in each temperature is lower than 900°C, it is assumed that during that hour the flare efficiency is zero and gas is not accounted for emission reductions purposes. Therefore, instead of considering 50% efficiency as required by the tool, the Project Participants are being more conservative while considering 0% efficiency. For this reason, data considered for emission reductions purposes is correct and more conservative.

Values of total LFG sent to power house in Sep-2015 presented in table above CAR 5 are not correct. Please refer to hourly and ER spreadsheets attached.

The only inconsistency found referred to hourly data on 09/02/2017. The system duplicated values in hours 19:59 and 20:59, which allocated data in different cells. Therefore, data presented in the ER spreadsheet is correct. Although data considered for emission reduction purposes is correct (since data is not the most conservative value while analysing the duplicated values), no emission reductions are claimed for this entire month for a conservative approach.

It is important mentioning that, the Project Participant updated the system to consider 1-minute interval. This update was made since the project is under renewal of the crediting period (third and last crediting period) and 1-minute interval is required by the updated version of the project emission from flaring tool. This approach will allow more data accuracy and avoid inconsistencies.

Please refer to the revised version of the Monitoring Report and ER spreadsheet.

#### Documentation provided by project participant

- Monitoring Report, version 3, 20/04/2018;
- ER spreadsheet, version 3, 20/04/2018.

#### DOE assessment

Date: 30/04/2018

The verification team confirms that for hours in which temperature is lower than 900°C the flare efficiency is considered zero and gas flow (values rounded down) is not accounted for emission reductions purposes and also that no emission reductions are claimed for the whole February 2017, as a very conservative approach. Although PP mentions that the system was (recently) updated for readings with 1-minute interval, the verification team would like to stress that all readings for present monitoring period (finishing on 22/12/2017) are provided with 5-minutes interval.

This CAR is closed.

CAR ID	CAR-6	Section no.	E.8	Date: 09/04/2018
<b>Description of CAR</b>				
While crosschecking LFG <sub>FIR200,y</sub> (m <sup>3</sup> ) and LFG <sub>FIR700,y</sub> (m <sup>3</sup> ) values from "Bandeirantes ER" spreadsheet / worksheet "Baseline Emissions" against "Bandeirantes ER" spreadsheet / worksheet "Monitored Data" values, the following inconsistencies were found:				
	worksheet "Baseline Emissions"		CORRECTED VALUES worksheet "Monitored Data"	
	LFG <sub>FIR200,y</sub> (m <sup>3</sup> )	LFG <sub>FIR700,y</sub> (m <sup>3</sup> )	LFG <sub>FIR200,y</sub> (m <sup>3</sup> )	LFG <sub>FIR700,y</sub> (m <sup>3</sup> )
2014	15,906,438.00		13,800,502.10	
2015		8,587,430.00		8,582,408.43
2016		323,795.00		323,760.94
<b>Project participant response</b>				Date: 20/04/2018
Data presented in "Bandeirantes ER" spreadsheet / worksheet "Baseline Emissions" is not presenting values with the discount for uncovered periods. Therefore, ER spreadsheet ("Baseline Emissions" sheet) was revised to consider data with discounts. However, this change did not impact the final ER calculation since it is based on quantity of methane from the system already considering the discount.				
As explained during the site visit, data presented in the ER spreadsheet presents total of biogas measured and average of methane concentration in the month as there is massive amount of data (5-minute recording frequency). However, the quantity of methane considered for emission reduction calculation is based on biogas and methane concentration continuously monitored from the PLC system, both measured at the same time and, therefore, data is correct and accurate.				
During verification, DOE has required to consider equations according to ACM0001 in the ER spreadsheet in order to determine emission reductions. However, as the PLC system calculates the quantity of methane based on biogas generation and methane concentration for <u>the same instant</u> , calculations are not required in the ER spreadsheet.				
In addition, while multiplying the amount of biogas by the <u>monthly average</u> of methane concentration, it results in a higher amount of methane than the one considered in the PLC system. Therefore, the amount of methane considered for emission reduction purposes is correct as it considers the biogas generation and the methane				

concentration for the same instant and it is more conservative while considering the monthly average. This information was included in the Monitoring Report. Please refer to the revised version of the Monitoring Report and ER spreadsheet.	
<b>Documentation provided by project participant</b>	
<ul style="list-style-type: none"> <li>- Monitoring Report, version 3, 20/04/2018;</li> <li>- ER spreadsheet, version 3, 20/04/2018.</li> </ul>	
<b>DOE assessment</b>	<b>Date: 30/04/2018</b>
<p>Corrected LFG values ("Bandeirantes ER" spreadsheet / worksheet "Monitored Data" values) are now used in latest "Bandeirantes ER" spreadsheet / worksheet "Baseline Emissions" version. The verification team also confirms that the values from PLC system are more conservative than the amount of biogas obtained when multiplying the amount of biogas by the monthly average of methane concentration and that can be confirmed in the added "cross check" columns in this latest revision of the "Bandeirantes ER" spreadsheet / worksheet "Monitored Data".</p> <p>This CAR is closed.</p>	

<b>CAR ID</b>	<b>CAR-7</b>	<b>Section no.</b>	<b>E.8.2</b>	<b>Date: 09/04/2018</b>
<b>Description of CAR</b>				
MR mentions that 1.3 tCO <sub>2</sub> /MWh default value (EF <sub>EL,j,y</sub> ) is used to calculate PE <sub>EC,y</sub> emissions. However, calculation at "Bandeirantes ER" spreadsheet / worksheet "Project Emissions" is using the EF <sub>CO<sub>2</sub>,D,t</sub> IPCC 2006 default data for diesel oil based on upper limit.				
<b>Project participant response</b>				<b>Date: 20/04/2018</b>
<p>Project emissions from the use of diesel oil generator were based on quantity of electricity generated by the use of fuel and the CO<sub>2</sub> emission factor of fossil fuel type i used in the period t. According to IPCC (2006), diesel oil emission factor is 0.0748 tCO<sub>2</sub>/GJ, while considering the upper limit value (more conservative value for project emissions calculation). This approach resulted in around 253 tCO<sub>2</sub>e during the monitored period. However, according to the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption", a default conservative factor of 1.3 tCO<sub>2</sub>e/MWh can be used in this case. While applying this value, it resulted in 1,223 tCO<sub>2</sub>e during the monitored period.</p> <p>Therefore, the project emissions due to the use of diesel oil used in the emergency captive generator were revised to consider the default factor of 1.3 tCO<sub>2</sub>e/MWh. Please refer to the revised version of the Monitoring Report and the ER spreadsheet.</p>				
<b>Documentation provided by project participant</b>				
<ul style="list-style-type: none"> <li>- Monitoring Report, version 3, 20/04/2018;</li> <li>- ER spreadsheet, version 3, 20/04/2018.</li> </ul>				
<b>DOE assessment</b>				<b>Date: 30/04/2018</b>
<p>PE<sub>EC,y</sub>emissions calculations were revised and are now using the 1.3 tCO<sub>2</sub>/MWh default value (EF<sub>EL,j,y</sub>).</p> <p>This CAR is closed.</p>				

Table 6. FAR from this verification

<b>FAR ID</b>	xx	<b>Section No.</b>		<b>Date:</b> DD/MM/YYYY
<b>Description of FAR</b>				
<b>Project participant response</b>				<b>Date:</b> DD/MM/YYYY
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date:</b> DD/MM/YYYY
There are no FARs from this verification.				

## Appendix 5. Monitored Parameters

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

Checklist Item (incl. guidance for the verification team)	Referen ce	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
<b>A. LFG<sub>Total,y</sub></b>		<i>Total amount of landfill gas in normal cubic meters captured at standard Normal Temperature and Pressure</i>				
<b>FV<sub>RG,h</sub></b>		<i>Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h</i>				
<b>a) Measurement / Determination method (VVS, §§ 363-367)</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>	/A 3/  /A 18/ to /A 28/  /A 10/  /A 11/  /A 16/  /A 14/  /A 29/	<i>Description:</i> Measurements from the flow-meters FIR200 (Flare 100 - LFG <sub>FIR200, y</sub> ), FIR700 (Flare 200- LFG <sub>FIR700, y</sub> ), FIR300 (LFG <sub>FIR300, y</sub> ), FIR400 (LFG <sub>FIR400, y</sub> ), FIR500 (LFG <sub>FIR500, y</sub> ) and FIR600 (LFG <sub>FIR600, y</sub> ). Equipment is connected to a supervisory computer system, which registers continuously the LFG measured. The supervisory system makes records of instant gas-flow every 5 minutes and the accumulated gas-flow every hour. Data aggregated daily, monthly and yearly. The counters are reseted at 00:00.  <i>Verifier's action:</i> The verification team reviewed the technical specifications of the meter against the registered PDD and at its physical location and cross checked values among ER spreadsheet (/A 11/) and PLC data-spreadsheets / records (/A 14/).  <i>Conclusion:</i> The measurement of the parameter is in line with the registered monitoring plan and the applied methodology.		<b>CAR-4</b> <b>CAR-5</b> <b>CAR-6</b>	<b>OK</b>	
		<div><input type="checkbox"/></div> <div>In this context the following findings have been raised:</div>				
		<div><input checked="" type="checkbox"/></div> <div>N/A</div>				
		<div><input type="checkbox"/></div> <div></div>				

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
<b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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 Appendix 6.</i>	/A 3/	<input type="checkbox"/>		It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan.		OK
	/A 18/ to /A 28/	<input checked="" type="checkbox"/>		For details regarding the accuracy and calibration details please refer to 0.		
	/A 10/	<input type="checkbox"/>		No delayed calibration has occurred.		
	/A 11/	<input type="checkbox"/>		As per the initial assessment the monitored value is deemed to be correct.		
	/A 16/	<input type="checkbox"/>		Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
	/A 14/	<input checked="" type="checkbox"/>		For details regarding calibration delays / uncovered periods please refer to 0.		
	/A 29/	<input checked="" type="checkbox"/>		A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
	/A 30/	<input type="checkbox"/>		The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/>		The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input checked="" type="checkbox"/>		The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument. <i>The equivalent error among flow meters, analysers, pressure and temperature transmitters was applied based on equipment accuracy and test results, whichever is higher according to the Standard.</i> <i>Conservatively, discounts were applied to the whole month not covered by calibration even if just some days of this month were not covered by a calibration</i>		



Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
				<p><i>certificate. Moreover, when the delay in calibration occurred in just one of several instruments involved in the calculation of a monitored parameter, accumulated errors from flow, pressure / temperature transmitters and methane analyser were considered in order to apply the discount.</i></p> <p><input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals</p> <p><input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</p> <p><input checked="" type="checkbox"/> In this context the following findings have been raised:</p> <p><input type="checkbox"/> N/A</p> <p><input checked="" type="checkbox"/> <b>CAR 4</b> <b>CAR 5</b> <b>CAR 6</b></p>		
<b>B. LFG<sub>Flare,y</sub></b>		<p><i>Total amount of landfill gas flared at Normal Temperature and Pressure</i></p> <p><i>Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h</i></p>				
<b>FV<sub>RG,h</sub></b>						
<p><b>a) Measurement / Determination method (VVS, §§ 363-367)</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)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment</i></p>	<p>/A 3/</p> <p>/A 18/ to /A 28/</p> <p>/A 10/</p> <p>/A 14/</p> <p>/A 3/</p>	<p><i>Description:</i> Measurements from the flow-meters FIR200 (Flare 100) and FIR700 (Flare 200). Equipment is connected to a supervisory computer system, which registers continuously the LFG measured. The supervisory system makes records of instant gas-flow every 5 minutes and the accumulated gas-flow every hour. Data aggregated daily, monthly and yearly. The counters are reseted at 00:00.</p> <p><i>Verifier's action:</i> The verification team reviewed the technical specifications of the meters against the registered PDD and at their physical location and cross checked values among ER</p>				<b>OK</b>

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
<p><i>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>/A 12/ /A 29/</p>	<p>spreadsheet(/A 11/), PLC data-spreadsheets / records (/A 14/) and Eletropaulo's data-spreadsheets (/A 16/).</p> <p><i>Conclusion:</i> The measurement of the parameter is in line with the registered monitoring plan and the applied methodology.</p> <p><input type="checkbox"/> In this context the following findings have been raised:</p> <p><input checked="" type="checkbox"/> N/A</p> <p><input type="checkbox"/></p>				
<p><b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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 Appendix 6.</i></p>	<p>/A 3/ /A 18/ to /A 28/ /A 10/ /A 14/ /A 3/ /A 12/ /A 29/ /A 30/</p>	<p><input type="checkbox"/> It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan.</p> <p><input checked="" type="checkbox"/> For details regarding the accuracy and calibration details please refer to 0.</p> <p><input type="checkbox"/> No delayed calibration has occurred.</p> <p><input type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct.</p> <p><input type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.</p> <p><input checked="" type="checkbox"/> For details regarding calibration delays / uncovered periods please refer to 0.</p> <p><input checked="" type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:</p> <p><input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration.</p> <p><input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument.</p>			<b>CAR-2</b> <b>CAR-3</b>	<b>OK</b>

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
		<input checked="" type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument. <i>The equivalent error among flow meters, analysers, pressure and temperature transmitters was applied based on equipment accuracy and test results, whichever is higher according to the Standard.</i> <i>Conservatively, discounts were applied to the whole month not covered by calibration even if just some days of this month were not covered by a calibration certificate. Moreover, when the delay in calibration occurred in just one of several instruments involved in the calculation of a monitored parameter, accumulated errors from flow, pressure / temperature transmitters and methane analyser were considered in order to apply the discount.</i>				
		<input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals.				
		<input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.				
		<input checked="" type="checkbox"/> In this context the following findings have been raised:				
		<input type="checkbox"/> N/A				
		<input checked="" type="checkbox"/> <b>CAR 2</b> <b>CAR 3</b>				
<b>C. LFG<sub>Electricity, y</sub></b>  <b>FV<sub>RG,h</sub></b>		<i>Amount of landfill gas combusted in power plant at Normal Temperature and Pressure</i>  <i>Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h</i>				

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.			
<b>a) Measurement / Determination method (VVS, §§ 363-367)</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.	/A 3/	Description: Measurements from the flow-meters FIR300 (LFG <sub>FIR300, y</sub> ), FIR400 (LFG <sub>FIR400, y</sub> ), FIR500 (LFG <sub>FIR500, y</sub> ) and FIR600 (LFG <sub>FIR600, y</sub> ). Equipment is connected to a supervisory computer system, which registers continuously the LFG measured. The supervisory system makes records of instant gas-flow every 5 minutes and the accumulated gas-flow every hour. Data aggregated daily, monthly and yearly. The counters are reseted at 00:00.				OK			
	/A 10/								
	/A 12/								
	/A 18/ to /A 28/								
	/A 29/	Verifier's action: The verification team reviewed the technical specifications of the meters against the registered PDD and at their physical location and cross checked values among ER spreadsheet (/A 11/) and PLC data-spreadsheets / records (/A 14/). Conclusion: The measurement of the parameter is in line with the registered monitoring plan and the applied methodology.							
<b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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.	/A 3/	<input type="checkbox"/>	In this context the following findings have been raised:		CAR-2 CAR-3	OK			
	/A 10/	<input checked="" type="checkbox"/>	N/A						
	/A 12/	<input type="checkbox"/>							
	/A 18/ to /A 28/	<input type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan.						
	/A 29/	<input type="checkbox"/>	For details regarding the accuracy and calibration details please refer to 0.						
	/A 30/	<input type="checkbox"/>	No delayed calibration has occurred.						
		<input type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.						
		<input type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.						
		<input checked="" type="checkbox"/>	For details regarding calibration delays / uncovered periods please refer to 0.						

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.		<input checked="" type="checkbox"/>		A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/>		The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/>		The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument.		
		<input checked="" type="checkbox"/>		<p>The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument.</p> <p><i>The equivalent error among flow meters, analysers, pressure and temperature transmitters was applied based on equipment accuracy and test results, whichever is higher according to the Standard.</i></p> <p><i>Conservatively, discounts were applied to the whole month not covered by calibration even if just some days of this month were not covered by a calibration certificate. Moreover, when the delay in calibration occurred in just one of several instruments involved in the calculation of a monitored parameter, accumulated errors from flow, pressure / temperature transmitters and methane analyser were considered in order to apply the discount.</i></p>		
		<input type="checkbox"/>		The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals.		
		<input type="checkbox"/>		The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input checked="" type="checkbox"/>		In this context the following findings have been raised:		
		<input type="checkbox"/>	N/A			

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.		
		<input checked="" type="checkbox"/> <b>CAR 2</b> <b>CAR 3</b>						
<b>D. PE<sub>Flares, y</sub></b>		<i>Project emissions from flaring of the residual gas stream in year y</i>						
<b>a) Measurement / Determination method (VVS, §§ 363-367)</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.	/A 1/	Description: Calculated as per the "Tool to determine project emissions from flaring gases containing methane".				OK		
	/A 2/	Verifier's action: Tool verified. ER spreadsheet calculations correct, in line with the registered monitoring plan of the PDD.						
	/A 7/	Conclusion: The calculation of this parameter is in line with the registered monitoring plan and the applied methodology.						
	/A 10/	<input type="checkbox"/> In this context the following findings have been raised:						
	/A 11/	<input checked="" type="checkbox"/> N/A						
<b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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 Appendix 6.	/A 18/ to	<input type="checkbox"/>				OK		
	/A 28/	<input checked="" type="checkbox"/> N/A						
	/A 29/	<input type="checkbox"/>						
	/A 30/							
		<b>Accuracy and QA/QC Procedure</b>						
		<input checked="" type="checkbox"/> Not applicable as this parameter is calculated.						
		<input type="checkbox"/> In this context the following findings have been raised:						
		<input checked="" type="checkbox"/> N/A						
		<input type="checkbox"/>						
		<b>Correctness</b>						
		Description:						
		Verifier's action: The tool and excel spreadsheets were checked.						
		Conclusion: Although calculations are correct, it is important to mention that during the monitored period it was verified that some instruments had uncovered periods by calibration and thus this value changed in further ER spreadsheet revisions due to the equivalent errors applied for the uncovered periods.						

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
		<input type="checkbox"/> In this context the following findings have been raised: <input checked="" type="checkbox"/> N/A <input type="checkbox"/>				
<b>E. w<sub>CH4</sub></b>		<i>Methane fraction in the landfill gas</i>				
<b>a) Measurement / Determination method (VVS, §§ 363-367)</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.	/A 1/ /A 2/ /A 7/ /A 10/ /A 11/ /A 18/ to /A 28/ /A 29/	Description: The data is continuously measured by the gas analyser and recorded electronically by PLC at least each five minutes and once per hour, instantaneously. The reading frequency is continuously and recorded by the PLC. Verifier's action: The verification team reviewed the raw data downloaded from the PLC (BFLGE - PLC spreadsheets) and compared it against the ER spreadsheet/Monitored Data, Biogás monitoring spreadsheets. Conclusion: The measurement of this parameter is in line with the registered monitoring plan and the applied methodology.				<b>OK</b>
<b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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	/A 7/ /A 10/ /A 11/ /A 12/ /A 18/ to /A 28/ /A 29/ /A 30/	<input checked="" type="checkbox"/> It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan <input checked="" type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6 <input checked="" type="checkbox"/> No delayed calibration has occurred <input checked="" type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct. <input checked="" type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.				<b>OK</b>

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.	
<i>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 Appendix 6.</i>		<input type="checkbox"/>		Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY			
		<input type="checkbox"/>		A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
		<input type="checkbox"/>		The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration			
		<input type="checkbox"/>		The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument			
		<input type="checkbox"/>		The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument			
		<input type="checkbox"/>		The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals			
		<input type="checkbox"/>		The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.			
		<input type="checkbox"/>		In this context the following findings have been raised:			
		<input checked="" type="checkbox"/>	N/A				
		<input type="checkbox"/>					
<b>F. EL<sub>LFG, y</sub></b>		<i>Net amount of electricity generated using LFG</i>					
<b>a) Measurement / Determination method (VVS, §§ 363-367)</b>	/A 10/ /A 11/	<i>Description:</i> Continuous readings from the electricity-meters located in the Eletropaulo' s (Electricity Utility) substation connected to the SIN. Biogás electricity-meters readings were not used for ER calculations.				<b>OK</b>	



Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
<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)). 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>	A 14/ /A 16/ /A 18/ to /A 28/ /A 29/	<i>Verifier's action:</i> The verification team reviewed Eletropaulo monthly/daily consumption-kWh spreadsheets (/A 16/) and compared it against the ER spreadsheet/Monitored Data - Electricity Exported-MWh (/A 11/).				
		<i>Conclusion:</i> The measurement of this parameter is in line with the registered monitoring plan and the applied methodology.				
		<input type="checkbox"/>	In this context the following findings have been raised:			
		<input checked="" type="checkbox"/>	N/A			
<p><b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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 Appendix 6.</i></p>	/A 10/ /A 11/ A 14/ /A 16/ /A 18/ to /A 28/ /A 29/ /A 30/	<input type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan		OK	
		<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6			
		<input type="checkbox"/>	No delayed calibration has occurred			
		<input type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.			
		<input type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period/s: <b>From</b> 01/09/2012 <b>To</b> 14/07/2015  <b>From</b> 15/07/2017 <b>To</b> 22/12/2017			
		<input checked="" type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
		<input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration <input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument <input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument <input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals <input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration. <input checked="" type="checkbox"/> In this context the following findings have been raised: <input checked="" type="checkbox"/> N/A <input type="checkbox"/>				
<b>G. <math>PE_{EC,y} = PE_{FC,y}</math></b>		<i>Project emissions from electricity consumption by the project activity during the year y</i> <i>Project emissions from fossil fuel combustion during the year y</i>				
<b>a) Measurement / Determination method (VVS, §§ 363-367)</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	/A 10/ /A 11/ A 14/ /A 16/ /A 18/ to /A 28/	Description: Calculated according to the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption". Verifier's action: Check calculations against applied Methodology and Tools methods. Conclusion: The calculation of this monitoring parameter is in line with registered monitoring plan and applied methodology. <input type="checkbox"/> In this context the following findings have been raised:				<b>OK</b>

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
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.	/A 29/	<input checked="" type="checkbox"/> N/A <input type="checkbox"/>				
<b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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 Appendix 6.	/A 10/ /A 11/ A 14/ /A 16/ /A 18/ to /A 28/ /A 29/ /A 30/	<b>Accuracy and QA/QC Procedure</b> <input checked="" type="checkbox"/> Not applicable as this parameter is calculated. <input type="checkbox"/> In this context the following findings have been raised: <input checked="" type="checkbox"/> N/A <input type="checkbox"/> <b>Correctness</b> <i>Description:</i> Calculated according to the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”. Continuous measurement and daily recording at PLC system. <i>Verifier’s action:</i> Check calculations against applied Methodology, Tools and MR. <i>Conclusion:</i> MR mentions that 1.3 tCO <sub>2</sub> /MWh default value (EF <sub>EL,j,y</sub> ) is used to calculate PE <sub>EC,y</sub> emissions. However, calculation at “Bandeirantes ER” spreadsheet / worksheet “Project Emissions” is using the EF <sub>CO<sub>2</sub>,D,I</sub> PCC 2006 default data for diesel oil based on upper limit. <input checked="" type="checkbox"/> In this context the following findings have been raised: <input type="checkbox"/> N/A <input checked="" type="checkbox"/> <b>CAR 7</b>			<b>CAR 7</b>	<b>OK</b>
<b>H. fv<sub>i,h</sub></b>		Volumetric fraction of component <i>i</i> in the residual gas in the hour <i>h</i> where <i>i</i> = CH <sub>4</sub>				
<b>a) Measurement / Determination method (VVS, §§ 363-367)</b>	/A 1/ /A 2/	<i>Description:</i> Please refer to parameter w <sub>CH<sub>4</sub>,y</sub> (E). <i>Verifier’s action:</i> Please refer to parameter w <sub>CH<sub>4</sub>,y</sub> (E).				<b>OK</b>

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.																
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.	/A 7/ /A 10/ /A 11/ /A 14/ /A 18/ to /A 28/ /A 29/	<p><b>Conclusion:</b> As the residual gas temperature does not exceed 60 °C, the requirement that flow rate and methane content measurements have to be carried out with the same basis (dry or wet) is not applicable.</p> <p>As a simplified approach, only the methane content of the residual gas is measured and the remaining part is considered as N<sub>2</sub>. Please refer to parameter w<sub>CH4,y</sub>.</p> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>In this context the following findings have been raised:</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>N/A</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> </tr> </table>	<input type="checkbox"/>	In this context the following findings have been raised:	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>															
<input type="checkbox"/>	In this context the following findings have been raised:																					
<input checked="" type="checkbox"/>	N/A																					
<input type="checkbox"/>																						
<p><b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</b></p> <p>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.</p> <p>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.</p> <p>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</p>	/A 1/ /A 2/ /A 7/ /A 10/ /A 11/ /A 14/ /A 18/ to /A 28/ /A 29/ /A 30/	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>For details regarding the accuracy and calibration details please refer to Appendix 6</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>No delayed calibration has occurred</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>As per the initial assessment the monitored value is deemed to be correct.</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY</td> </tr> <tr> <td><input type="checkbox"/></td> <td>A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:</td> </tr> <tr> <td><input type="checkbox"/></td> <td>The maximum permissible error of the instrument has been applied to the values during the period between</td> </tr> </table>	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6	<input checked="" type="checkbox"/>	No delayed calibration has occurred	<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.	<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.	<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY	<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:	<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between				OK
<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan																					
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<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY																					
<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:																					
<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between																					

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.				
				<input type="checkbox"/> scheduled date of calibration and the actual date of calibration <input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument <input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument <input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals <input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration. <input type="checkbox"/> In this context the following findings have been raised: <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>N/A</td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> </tr> </table>	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>			
<input checked="" type="checkbox"/>	N/A									
<input type="checkbox"/>										
<b>I. T<sub>flare</sub></b>		<i>Temperature in the exhaust gas of the flare</i>								
<b>a) Measurement / Determination method (VVS, §§ 363-367)</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.	/A 1/ /A 2/ /A 7/ /A 10/ /A 11/ /A 14/ /A 18/ to /A 28/	Description: Continuous readings from the thermocouples installed in each flare. The instruments are connected to a supervisory computer system (every 5 minutes and every hour), which registers continuously the combustion temperature measured. Verifier's action: The verification team has reviewed the MR, ER spreadsheet, instruments specifications and checked onsite instruments. Conclusion: The measurement of this monitoring parameter is in line with registered monitoring plan and applied methodology. <input type="checkbox"/> In this context the following findings have been raised: <table border="1"> <tr> <td><input checked="" type="checkbox"/></td> <td>N/A</td> </tr> </table>	<input checked="" type="checkbox"/>	N/A			<b>OK</b>			
<input checked="" type="checkbox"/>	N/A									

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/A 29/	<input type="checkbox"/>				
<b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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 Appendix 6.</i>	/A 1/	<input type="checkbox"/>		It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	<b>CAR-2</b> <b>CAR-3</b>	OK
	/A 2/					
	/A 7/	<input checked="" type="checkbox"/>		For details regarding the accuracy and calibration details please refer to Appendix 6		
	/A 10/					
	/A 11/	<input type="checkbox"/>		No delayed calibration has occurred		
	/A 14/	<input type="checkbox"/>		As per the initial assessment the monitored value is deemed to be correct.		
	/A 18/ to /A 28/	<input type="checkbox"/>		Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
	/A 29/					
	/A 30/	<input checked="" type="checkbox"/>		Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input checked="" type="checkbox"/>		A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/>		The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/>		The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument.		
		<input checked="" type="checkbox"/>		The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument. <i>The equivalent error among flow meters, analysers, pressure and temperature transmitters was applied</i>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification	Team	Comments	Draft Concl.	Final Concl.
				<p>based on equipment accuracy and test results, whichever is higher according to the Standard.</p> <p>Conservatively, discounts were applied to the whole month not covered by calibration even if just some days of this month were not covered by a calibration certificate. Moreover, when the delay in calibration occurred in just one of several instruments involved in the calculation of a monitored parameter, accumulated errors from flow, pressure / temperature transmitters and methane analyser were considered in order to apply the discount.</p> <p><input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals.</p> <p><input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</p> <p><input checked="" type="checkbox"/> In this context the following findings have been raised:</p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/> <b>CAR 2</b></p> <p><b>CAR 3</b></p>		
<b>J. <math>CEF_{elec,y} = EF_{CM,grid,y}</math></b>		<b>Electricity Baseline Emission Factor</b>				
<p><b>a) Measurement / Determination method (VVS, §§ 363-367)</b></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</p>	<p>/A 1/</p> <p>/A 2/</p> <p>/A 10/</p> <p>/A 11/</p> <p>/A 14/</p>	<p><i>Description:</i> Calculated using <math>EF_{OM}</math> and <math>EF_{BM}</math> from the Brazilian DNA/MCTIC - "Tool to calculate the emission factor for an electricity system".</p> <p><i>Verifier's action:</i> The Brazilian DNA website has been checked (/A 15/).</p> <p><i>Conclusion:</i> The calculation of this monitoring parameter is in line with registered monitoring plan and applied methodology.</p> <p><input type="checkbox"/> In this context the following findings have been raised:</p>			<b>CAR 1</b>	<b>OK</b>

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
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.	/A 15/	<input checked="" type="checkbox"/> N/A <input type="checkbox"/>				
<b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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 Appendix 6.	/A 1/ /A 2/ /A 10/ /A 11/ /A 14/ /A 15/ /A 30/	<b>Accuracy and QA/QC Procedure</b> <input checked="" type="checkbox"/> Not applicable as this parameter is calculated. <input type="checkbox"/> In this context the following findings have been raised: <input checked="" type="checkbox"/> N/A <input type="checkbox"/> <b>Correctness</b> <i>Description:</i> Calculated using EF <sub>OM</sub> and EF <sub>BM</sub> from the Brazilian DNA/MCTIC - "Tool to calculate the emission factor for an electricity system". <i>Verifier's action:</i> The Brazilian DNA website has been checked (/A 15/). <i>Conclusion:</i> "Bandeirantes ER" spreadsheet / worksheet "El. Grid emission factor" presents OM average values for 2012 and 2017 that are not in accordance with the values obtained in the spreadsheets (Despacho-YYYY.xlsx) from the Brazilian DNA/MCTIC. <input checked="" type="checkbox"/> In this context the following findings have been raised: <input type="checkbox"/> <input checked="" type="checkbox"/> <b>CAR 1</b>			<b>CAR-1</b>	<b>OK</b>
<b>K. EC<sub>PJ,i,y</sub></b>		Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)				
<b>a) Measurement / Determination method (VVS, §§ 363-367)</b> Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level	/A 1/ /A 2/ /A 10/	<i>Description:</i> The electricity consumed by the plant is monitored through hours of operation from generator while applying the maximum output capacity of the generator 125kW, as a volume meter is not usual given the little consumption and capacity of generator. While adopting the maximum oil consumption capacity (44l/h) from manufacturer's specification, and applying diesel oil				<b>OK</b>



Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.																											
<p>(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>	/A 11/ /A 14/ /A 18/ to /A 28/ /A 29/	<p>NCV and EF, it results in lower project emissions. Therefore, the approach considered by the PP is very conservative.</p> <p>Verifier's action: Daily operation reports with data/hours of generator in operation were checked.</p> <p>It was noticed that a complete hour is registered in the PLC system even if the generator has operated, for instance, for only 15 minutes (minute 'values' rounded to 01 hour).</p> <table border="1"> <thead> <tr> <th>Year</th><th>EC<sub>PJ,i,y</sub> (MWh)</th><th>Hours of Operation</th></tr> </thead> <tbody> <tr> <td>From 01/09/2012</td><td>4</td><td>35</td></tr> <tr> <td>2013</td><td>3</td><td>20</td></tr> <tr> <td>2014</td><td>17</td><td>134</td></tr> <tr> <td>2015</td><td>358</td><td>2,862</td></tr> <tr> <td>2016</td><td>558</td><td>4,463</td></tr> <tr> <td>Up to 22/12/2017</td><td>2</td><td>12</td></tr> <tr> <td><b>TOTAL</b></td><td><b>941</b></td><td><b>7,526</b></td></tr> </tbody> </table> <p>Conclusion: The measurement of this monitoring parameter is in line with registered monitoring plan and applied methodology.</p> <p><input type="checkbox"/> In this context the following findings have been raised:</p> <table border="1"> <tbody> <tr> <td><input checked="" type="checkbox"/></td><td>N/A</td></tr> <tr> <td><input type="checkbox"/></td><td></td></tr> </tbody> </table>		Year	EC <sub>PJ,i,y</sub> (MWh)	Hours of Operation	From 01/09/2012	4	35	2013	3	20	2014	17	134	2015	358	2,862	2016	558	4,463	Up to 22/12/2017	2	12	<b>TOTAL</b>	<b>941</b>	<b>7,526</b>	<input checked="" type="checkbox"/>	N/A	<input type="checkbox"/>			
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	<input checked="" type="checkbox"/>	N/A																															
<input type="checkbox"/>																																	
<p><b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</b></p> <p>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the</p>	/A 1/ /A 2/ /A 10/	<p><input type="checkbox"/> It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</p> <p><input type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6</p>			OK																												

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
<i>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 Appendix 6.</i>	/A 11/	<input type="checkbox"/>		No delayed calibration has occurred		
	/A 14/	<input type="checkbox"/>		As per the initial assessment the monitored value is deemed to be correct.		
	/A 18/ to /A 28/	<input type="checkbox"/>		Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
	/A 29/	<input type="checkbox"/>		Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
	/A 30/	<input type="checkbox"/>		A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/>		The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/>		The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>		The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>		The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/>		The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/>		In this context the following findings have been raised:		
		<input checked="" type="checkbox"/>		N/A		
	<input type="checkbox"/>					

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
<b>L. Other flare operation parameters</b>		<i>Data and parameters that are required to monitor whether the flare operates within the range of operating conditions according to the manufacturer's specifications</i>				
<b>a) Measurement / Determination method (VVS, §§ 363-367)</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.	/A 1/ /A 2/ /A 7/ /A 10/ /A 11/ /A 14/ /A 18/ to /A 28/ /A 29/	<i>Description:</i> Continuous readings from the thermocouples installed in each flare. Instruments are connected to a supervisory computer system, which registers continuously the combustion temperature measured. For each flare, the supervisory system makes records of instant temperature every 5 minutes and every hour. <i>Verifier's action:</i> The verification team has reviewed the MR, ER spreadsheet, instruments specifications and checked onsite instruments. <i>Conclusion:</i> The monitoring of these parameters is in line with the registered MP of the PDD and with the applied methodology.			OK	OK
		<input type="checkbox"/> In this context the following findings have been raised:				
		<input checked="" type="checkbox"/> N/A				
		<input type="checkbox"/>				
<b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 368-374)</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.	/A 1/ /A 2/ /A 7/ /A 10/ /A 11/ /A 14/ /A 18/ to /A 28/ /A 29/					OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification (Means and results of assessment)	Team	Comments	Draft Concl.	Final Concl.
<i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/A 30/					

## 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	Manufacturer/ Model	Serial number	Type	Accuracy (%) or accuracy class	Calibration date(s) during this monitoring period - 01/09/2012 22/12/2017	Error equip. applied to uncovered calibration periods (+/- %)	Delay in calibration: yes/no	Period of delayed calibration ----- MONTH/YEAR (MM/YYYY) WHERE ERROR WAS APPLIED AT ER SPREADSHEET
Thermal mass flow meter (FIR 100 –total amount of landfill gas captured) Cal. frequency: 5 years	LFG <sub>FIR100, y</sub> / FV <sub>RG, h</sub>	Endress-Hauser / t-mass 65 l DN175 / 7" (177.75 mm)	9407D902000	Flow meter	1.5	<b>Calibrated:</b> 25/04/2007 <b>Validity:</b> 24/04/2012	2.693	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 29/04/2016 <b>to</b> 15/05/2016 ----- 04/2016 and 05/2016
		FCI / ST51-3F33FM00	341992-A		2.5	<b>Calibrated:</b> 29/04/2011 <b>Validity:</b> 28/04/2016  <b>Calibrated:</b> 16/05/2016 <b>Validity:</b> 15/05/2021			

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Thermal mass flow meter (FIR 700 – gas flow to flare F200) Cal. frequency: 5 years	LFG <sub>FIR700, y/</sub> FV <sub>RG, h</sub>	FCI / ST51-3F11CN00	328849	Flow meter	2.5	Calibrated: 08/09/2010 Validity: 07/09/2015  Calibrated: 12/02/2016 Validity: 11/02/2021	2.748	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From 08/09/2015 to 11/02/2016 ----- 09/2015 to 12/2015 01/2016 and 02/2016
Thermocouples (FIR700 - TAC570) Cal. frequency: 1 year		ENGRO (Changed on 28/08/2012 according to operation diary - /A 14/)	N/A	Temperature sensor	0.25 or 1.5 °C	Calibrated: 19/09/2011 Validity: 18/09/2012		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	No delay.
		TERMOSHAW	N/A	Temperature sensor	0.25 or 1.5 °C	Calibrated: 14/09/2012 Validity: 13/09/2013		<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From 28/08/2012 to 13/09/2012 09/2012
						Calibrated: 23/07/2013 Validity: 22/07/2014		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	No delay.
						Calibrated: 23/07/2014 Validity: 22/07/2015		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	No delay.
						Calibrated: 14/08/2014 Validity: 13/08/2015		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	No delay.
						Calibrated: 26/11/2014 Validity: 25/11/2015		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	No delay.
						Calibrated: 21/08/2015 Validity: 20/08/2016		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	No delay.

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						<b>Calibrated:</b> 23/08/2016 <b>Validity:</b> 22/08/2017		<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 23/08/2017 <b>To</b> 22/08/2016 ---- 08/2016
						<b>Calibrated:</b> 15/09/2017 <b>Validity:</b> 14/09/2018		<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 23/08/2017 <b>To</b> 14/09/2017 ---- 08/2017 and 09/2017
<b>Turbine flow meter (FIR 200 – gas flow to flare F100)</b> <b>Cal. frequency: 5 years</b>	LFG <sub>FIR200, y</sub> / FV <sub>RG, h</sub>	INCONTROL / VTGEX200C0 10243RAN1/7	VG15239	Flow meter	1.0	<b>Calibrated:</b> 30/03/2009 <b>Validity:</b> 29/03/2014  <b>Calibrated:</b> 01/07/2009 <b>Validity:</b> 30/06/2014  <b>Calibrated:</b> 12/11/2014 <b>Validity:</b> 11/11/2019	1.662 (up to Sep-2012) 1.603 (from Sep-2012 onwards)	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 30/03/2014 <b>To</b> 11/11/2014 ---- 03/2014 to 11/2014
Temperature transmitter (FIR 200) <b>Cal. frequency: 5 years</b>		ASTA / PT-100	S377815	Temperature transmitter	0.6471	<b>Calibrated:</b> 26/03/2009 <b>Validity:</b> 25/03/2014  <b>Calibrated:</b> 14/07/2014 <b>Validity:</b> 13/07/2019			
Pressure transmitter (FIR 200) <b>Cal. frequency: 5 years</b>		SMAR / M2	L454793	Pressure transmitter	0.20	<b>Calibrated:</b> 27/03/2009 <b>Validity:</b> 26/03/2014  <b>Calibrated:</b> 20/06/2014 <b>Validity:</b> 19/06/2019			

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Thermocouples (FIR200 - TAC520) <b>Cal. frequency: 1 year</b>		JUMO (Changed on 28/08/2012 according to operation diary - /A 14/)	N/A	Temperature sensor	0.25 or 1.5 °C	<b>Calibrated:</b> 24/08/2011 <b>Validity:</b> 23/08/2012		<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	No delay.
		TERMOSHAW	N/A	Temperature sensor	0.25 or 1.5 °C	<b>Calibrated:</b> 14/09/2012 <b>Validity:</b> 13/09/2013		<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 24/08/2012 <b>To</b> 13/09/2012 ----- 09/2012
						<b>Calibrated:</b> 17/09/2013 <b>Validity:</b> 16/09/2014		<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 14/09/2013 <b>To</b> 16/09/2013 ----- 09/2013
						<b>Calibrated:</b> 19/09/2014 <b>Validity:</b> 18/09/2015		<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 17/09/2014 <b>To</b> 18/09/2014 ----- 09/2014
						<b>Calibrated:</b> 23/12/2015 <b>Validity:</b> 22/12/2016		<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 19/09/2015 <b>To</b> 22/12/2015 ----- 09/2015 to 12/2015
						<b>Calibrated:</b> 18/07/2017 <b>Validity:</b> 17/07/2018		<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 23/12/2016 <b>To</b> 17/07/2017 ----- 12/2016 to 07/2017
Turbine flow meter (FIR 300 – gas flow to powerhouse) <b>Cal. frequency: 5 years</b>	LFG <sub>FIR300, y</sub> / FV <sub>RG, h</sub>	INCONTROL / VTGEX200	VG083B6	Flow meter	1.0	<b>Calibrated:</b> 13/12/2006 <b>Validity:</b> 12/12/2011  <b>Calibrated:</b> 03/11/2011 <b>Validity:</b> 02/11/2016	1.549	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 26/03/2014 <b>To</b> 01/04/2014 ----- 03/2014 and 04/2014

Temperature transmitter (FIR 300) <b>Cal. frequency: 5 years</b>		ASTA / PT-100	S502986	Temperature transmitter	0.5993	<b>Calibrated:</b> 26/03/2009 <b>Validity:</b> 25/03/2014  <b>Calibrated:</b> 02/04/2014 <b>Validity:</b> 01/04/2019			
Pressure transmitter (FIR 300) <b>Cal. frequency: 5 years</b>		SMAR / LD291	33007-06	Pressure transmitter	0.20	<b>Calibrated:</b> 06/05/2009 <b>Validity:</b> 05/05/2014  <b>Calibrated:</b> 15/04/2014 <b>Validity:</b> 14/04/2019			
<b>Turbine flow meter (FIR 400 – gas flow to powerhouse)</b> <b>Cal. frequency: 5 years</b>	LFG <sub>FIR400, y</sub> / FV <sub>RG,h</sub>	INCONTROL / VTGEX200	VG084B6	Flow meter	1.0	<b>Calibrated:</b> 13/12/2006 <b>Validity:</b> 12/12/2011  <b>Calibrated:</b> 10/03/2011 <b>Validity:</b> 09/03/2016	1.439	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From 27/03/2014 To 14/04/2014</b> ---- 03/2014 and 04/2014
Temperature transmitter (FIR 400) <b>Cal. frequency: 5 years</b>		ASTA / PT-100	S502987	Temperature transmitter	0.1775	<b>Calibrated:</b> 26/03/2009 <b>Validity:</b> 25/03/2014  <b>Calibrated:</b> 14/03/2014 <b>Validity:</b> 13/03/2019			
Pressure transmitter (FIR 400) <b>Cal. frequency: 5 years</b>		SMAR / LD291	L42237	Pressure transmitter	0.20	<b>Calibrated:</b> 27/03/2009 <b>Validity:</b> 26/03/2014			



years						<b>Calibrated:</b> 15/04/2014 <b>Validity:</b> 14/04/2019			
<b>Turbine flow meter (FIR 500 – gas flow to powerhouse)</b> <b>Cal. frequency: 5 years</b>	LFG <sub>FIR500, y</sub> / FV <sub>RG, h</sub>	INCONTROL / VTGEX200	VG086B6	Flow meter	1.0	<b>Calibrated:</b> 13/12/2006 <b>Validity:</b> 12/12/2011  <b>Calibrated:</b> 14/12/2011 <b>Validity:</b> 13/12/2016  <b>Calibrated:</b> 10/02/2017 <b>Validity:</b> 09/02/2022	1.673	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 14/12/2016 <b>To</b> 09/02/2017 ---- 12/2016 01/2017 and 02/2017
Temperature transmitter (FIR 500) <b>Cal. frequency: 5 years</b>		ASTA / PT-100	S502988	Temperature transmitter	0.8717	<b>Calibrated:</b> 26/03/2009 <b>Validity:</b> 25/03/2014  <b>Calibrated:</b> 14/03/2014 <b>Validity:</b> 13/03/2019			
Pressure transmitter (FIR 500) <b>Cal. frequency: 5 years</b>		SMAR / LD291	33006-06	Pressure transmitter	0.20	<b>Calibrated:</b> 23/06/2009 <b>Validity:</b> 22/06/2014  <b>Calibrated:</b> 28/02/2014 <b>Validity:</b> 27/02/2019			
<b>Turbine flow meter (FIR 600 – gas flow to</b>	LFG <sub>FIR600, y</sub> / FV <sub>RG, h</sub>	INCONTROL / VTGEX200	VG085B6	Flow meter	1.0	<b>Calibrated:</b> 13/12/2006 <b>Validity:</b>	1.442	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 14/09/2016 <b>To</b> 14/12/2016 ----

powerhouse) Cal. frequency: 5 years	LFGElectricity, y					12/12/2011  <b>Calibrated:</b> 14/09/2011 <b>Validity:</b> 13/09/ 2016  <b>Calibrated:</b> 15/12/2016 <b>Validity:</b> 14/12/ 2021			09/2016 to 12/2016
Temperature transmitter (FIR 600) Cal. frequency: 5 years		ASTA / PT- 100	S502989	Temperature transmitter	0.1998	<b>Calibrated:</b> 26/03/2009 <b>Validity:</b> 25/03/2014  <b>Calibrated:</b> 02/04/2014 <b>Validity:</b> 01/04/2019			
Pressure transmitter (FIR 600) Cal. frequency: 5 years		SMAR / LD291	33005-06	Pressure transmitter	0.20	<b>Calibrated:</b> 17/04/2009 <b>Validity:</b> 16/04/2014  <b>Calibrated:</b> 28/02/2014 <b>Validity:</b> 27/02/2019			
Methane (gas) analyser Cal. frequency: weekly	fvi,h / wCH4,y	Rosemount - NUK	99965398	Binos 100M	1.0	Calibrated every week against a standard certified gas cylinder/s.	1.0	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	No delay.
Electricity meters (Landfill) Cal. frequency: 2 years	EL <sub>LFG</sub> , y	Schneider Electronic / CM4000	11001426		0.2	<b>Calibrated:</b> 30/10/2009 <b>Validity:</b> 29/10/2011	0.200	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 01/09/2009 <b>To</b> 29/10/2009  <b>From</b> 30/10/2011 <b>To</b> 15/04/2012

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						<b>Calibrated:</b> 16/04/2012 <b>Validity:</b> 15/04/2014			<b>From</b> 16/04/2012 <b>To</b> 15/06/2017  <b><u>Not used for</u></b> <b><u>ER</u></b> <b><u>calculations</u></b>
		Schneider Electronic / CM4000	11001414			<b>Calibrated:</b> 30/10/2009 <b>Validity:</b> 29/10/2011  <b>Calibrated:</b> 16/04/2012 <b>Validity:</b> 15/04/2014			
		Power Logic / CM4000	12001437			<b>Calibrated:</b> 16/06/2017 <b>Validity:</b> 16/06/2019			
Electricity meters (Substation) <b>Cal. frequency: 2 years</b>	EL <sub>LFG, y</sub>	Landis gyr / Saga 1000	1168593		0.2	<b>Calibrated:</b> 15/07/2015 <b>Validity:</b> 14/07/2017	0.200	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	<b>From</b> 01/09/2012 <b>To</b> 14/07/2015  <b>From</b> 15/07/2017 <b>To</b> 22/12/2017 ----- 09/2012 to 07/2015 07/2017 to 12/2017
		Landis gyr / Saga 1000	1168594			<b>Calibrated:</b> 15/07/2015 <b>Validity:</b> 14/07/2017			

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
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