Monitoring report form for CDM project activity (Version 09.0)

MONITORING REPORT			
Title of the project activity	ESTRE's Paulínia Landfill Gas Project (EPLGP)		
UNFCCC reference number of the project activity	0165		
Version number of the PDD applicable to this monitoring report	04.5		
Version number of this monitoring report	2.0		
Completion date of this monitoring report	08/11/2021		
Monitoring period number	#16		
Duration of this monitoring period	14/09/2013 - 30/09/2014		
Monitoring report number for this monitoring period	Not applicable.		
Project participants	ESTRE Ambiental S/A Nordic Environment Finance Corporation		
Host Party	Brazil		
Applied methodologies and standardized baselines	ACM0001 - "Flaring or use of landfill gas" (version 13.0.0)		
Sectoral scopes	13 - Waste handling and disposal		
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013 until 31 December 2020	Amount achieved from 1 January 2021
	-	491,939 tCO_2e	-
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	523,726 tCO_2e		

SECTION A. Description of project activity

A.1. General description of project activity

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The CDM project activity "ESTRE's Paulínia Landfill Gas Project (EPLGP)" is implemented at the CGR Paulínia landfill[1]. The project activity promotes real and measurable permanent abatement of greenhouse gas (GHG) emissions through collection and destruction (combustion in high temperature enclosed flares) of landfill gas (LFG) that is generated at this landfill.

LFG is rich in methane (CH_4), a powerful GHG. The CGR Paulínia landfill has been under operation by the project owner and host-country project participant ESTRE Ambiental S/A since its commissioning date in May 2000.

LFG is generated at the CGR Paulínia landfill as a result of anaerobic decomposition of municipal solid waste (MSW) historically disposed at the landfill. The project activity so far encompasses the following components/infrastructure:

(i) Capturing of LFG through a set of LFG collecting wells that are interconnected through a LFG collection pipeline network
(ii) Destruction of all collected LFG (which is collected by the LFG collecting wells and transported through the LFG collection pipeline network) by combustion (in high temperature enclosed flares installed in the project's LFG destruction facility).

As indicated in the registered version of the PDD valid for the 2nd 7-year renewable crediting period of the project activity (PPD version 4.5 dated 29/02/2016, hereafter denominated as PDD), the project design under its current configuration does not encompass any utilization of LFG. The project activity was implemented and remains being operated without having any share of collected LFG being utilized as energy carrier or fuel as being utilized under any other kind of economic utilization. During the monitoring period from 14/09/2013 to 30/09/2014, no collected LFG was thus utilized as gaseous fuel for electricity generation, as gaseous fuel in boilers or for any purpose other than being destroyed through combustion in the installed high temperature enclosed flares.

By the end of the considered monitoring period, the implemented project's LFG collection system encompassed about 411 vertical LFG collection wells. No horizontal LFG collection trenches have so far been utilized for collecting LFG at the CGR Paulínia landfill. During the considered monitoring period, LFG was collected at the CGR Paulínia landfill with the utilization of 4 centrifugal blowers which are connected to the project's LFG collecting pipeline network.

As part of the operation of the project activity, all collected LFG is conducted within the LFG collecting pipeline network to main pipelines that are interconnected in a main pipeline in the LFG destruction facility. LFG sent to the flares is combusted under high temperature and controlled conditions.

The amount and quality of collected LFG which is sent to the set of flares have been continuously measured, recorded and reported along the considered monitoring period. During the considered monitoring period, monitoring activities encompassed continuous measurements of LFG flow sent to the flares, CH_4 content of collected LFG sent to the flares, LFG temperature and LFG pressure. As also established in the project's monitoring procedure valid for the 2nd 7-year crediting period, the status/conditions of the high temperature enclosed flares and their compliance with operational requirements (as established by the flare equipment manufacturer) are also monitored.

[1] CGR stands for "*Centro de Gerenciamento de Resíduos"* in Brazilian Portuguese language ("Waste Management Center" when translated into English language).

All LFG related monitoring instruments/equipment (incl. LFG flow meter, LFG pressure sensor, LFG temperature sensor, LFG CH_4 content gas analyzer) are installed in the main LFG pipeline of the project activity. Thermocouples for measuring temperature of the exhaust gas of the flares are installed in the upper section of each flare. The installed high temperature enclosed flares are also equipped with Ultra-violet (UV) flame detectors (of which status (flare "*on*" or flare "*off*") is also continuously monitored). The set of LFG and flaring related continuous measurements are recorded and reported with an every minute frequency. Data is stored in a computerized database located in the project's control room.

During the considered monitoring period, the project activity was implemented and has operated under the following configuration:

- 4 identical centrifugal blowers with LFG collection capacity of up to 5,000 Nm^3/h each
- 6 high temperature enclosed flares (of which specifications are presented in the PDD).
- 2 backup captive off-grid backup electricity generators fuelled by diesel with nameplate installed capacity of 450 kVA and 512 kVA (that are used to supply the project's electricity demand during temporary planned or unplanned events when the supply of grid-sourced electricity to the project activity is interrupted)
- All monitoring instruments/equipment which are required for measuring LFG related parameters, temperature of the exhaust gas of the flares, status of the flares and grid electricity consumption (of which specifications are presented in Section D.2).

The MSW disposal area at the CGR Paulínia landfill comprises about 603,812 square meters. About 20,250,000 ton of MSW are disposed in such area. During the considered monitoring period, about 75% of the project's existing LFG collecting wells were connected to the project's LFG collecting pipeline (in the average)[2].

Further details about installed GHG abatement equipment are included in Section B.1. Details about all installed monitoring equipment/instruments are made available in Section D.2.

ESTRE Ambiental S/A (the host country project participant for the project activity and the owner and operator of the CGR Paulínia landfill) has implemented a quality assurance and control (QA/QC) and environmental management (EMS) system for all activities undertaken at the CGR Paulínia landfill. The company's ISO 14001 certified QA/QC/EMS system was previously implemented in year 2006. The boundary/scope of this QA/QC/EMS system currently also encompasses applicable work procedures for the operation and monitoring of the project activity.

GHG emission reductions achieved by the project activity during the considered monitoring period from 14/09/2013 to 30/09/2014: 491,939 tCO_2e.

A.2. Location of project activity

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The project activity is implemented at the CGR Paulínia landfill that is located in the city of Paulínia that is positioned within the Metropolitan Region of Campinas, which is formed by 18 municipalities. The CGR Paulínia landfill is located at Estrada Municipal PLN 190, s/no., Parque da Represa, Paulínia – SP, Brazil. The project site is located about 130 km Northern São Paulo city.

[2] As part of the normal operation of the CGR Paulínia landfill (and also as part of the normal operation of the project activity), some of the project's LFG collecting wells are often temporarily disconnected from the project's LFG collection pipeline in order to facilitate continuous activities of MSW disposal and compacting, thus allowing transit of machinery (wheel loaders and excavators) and trucks as part of the normal operations of the CGR Paulínia landfill. Furthermore, sometimes some of the project's LFG extracting wells are also often temporarily disconnected from the LFG collection pipeline due to repair, operational and/or maintenance reasons. (welding and other repair services at the wells and/or pipeline, repositioning of the LFG pipeline, maintenance in the head of the LFG wells, etc.).

The project site has the following geographical coordinates:

- Latitude: -22.773506°
- Longitude: -47.196161°

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Brazil (host)	ESTRE Ambiental S/A	No
Norway	Nordic Environment Finance Corporation.	No

A.4. References to applied methodologies and standardized baselines

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The project activity applies the following large-scale CDM baseline and monitoring methodology:

- ACM0001 - ”Flaring or use of landfill gas” (version 13.0.0). (http://cdm.unfccc.int/filestorage/E/Y/F/EYFHCV3K4J5P06DTQSG9WLMOBNUX2I/EB67_repan12_ACM0001_ver13.0.0.pdf?t=aWV8bmVmZHlhfDAbkn62RDZuyjHVzDOMoxMx)

For the considered monitoring period, as also established in the PDD, the following methodological tools are also applied[3]:

- “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” (version 01) (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf).

  The application of this tool refers to the ex-post application of the “Tool to calculate the emission factor for an electricity system” (version 03.0) (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v3.0.pdf)

- “Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion” (version 02) (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf)

- “Project emissions from flaring” (version 02.0.0, EB 68) (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-06-v2.0.pdf);

- “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (version 02.0.0, EB 61) (http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-08-v2.0.0.pdf);

[3] The PDD also refers to the methodological tool “Emissions from solid waste disposal sites” (version 06.0.1, EB66). However, it is crucial to note that, as outlined in the PDD, applicable guidance of this methodological tool is only applied in the context of ex-ante estimation of emission reductions to be achieved by the project activity during the 2nd 7-year crediting period. This methodological tool is not applied for the ex-post determination of emission reductions achieved by the project activity. The following methodological tools (that are also outlined in the PDD) are not applied in the context of the ex-post determination of emission reductions achieved by the project activity either:

- “Tool to determine the baseline efficiency of thermal or electric energy generation systems” (Version 01);
- “Tool to determine the remaining lifetime of equipment” (Version 01);
- “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” (Version 03.0.1);
- “Combined tool to identify the baseline scenario and demonstrate additionality” (Version 05.0.0);

A.5. Crediting period type and duration

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From 14/09/2013 to 13/09/2020 (2nd 7-year renewable crediting period).

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

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The "ESTRE's Paulínia Landfill Gas Project (EPLGP)" was registered under the CDM on 03/03/2006. The construction of the project's LFG capture and destruction system (using high temperature enclosed flares) was initiated in March 2006 and was concluded in September 2006. While related testing and commissioning phases occurred in September 2006, the official starting of operations of the project activity (with monitoring data measurements being recorded) is 14/09/2006.

At the end of the considered monitoring period, the implemented project's LFG collection system consisted of about 411 operational LFG collecting wells interconnected through a high-density polyethylene pipeline network. The LFG collecting wells are used to extract LFG from inner section of the landfill. All collected LFG is transported to the project's LFG destruction facility (where the 6 high temperature enclosed flares are positioned) through a high-density polyethylene (HDPE) pipeline network. This pipeline includes condensation pots (where most of the humidity in collected LFG is physically removed/drained through condensation).

During the considered monitoring period, collected LFG has been sucked and pressurized by the installed 4 centrifugal blowers powered by electricity motors. The quantity and quality of collected LFG that is sent to the installed high temperature enclosed flares are measured by following applicable guidance of ACM0001 (version 13.0.0) and the methodological tool "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 02.0.0) (with Option C being applied). Thus the determination of the absolute humidity of the gaseous stream is not required. Fraction of CH_4 in collected LFG stream as well as LFG flow for each individual flare (monitoring parameters "Volumetric flow of LFG stream in time interval *t* on a wet basis" ($V_{t,wb}$) and "Volumetric fraction of CH_4 in the collected LFG in time interval *t* on a wet basis" ($v_{i,t,wb}$) respectively) are assumed as monitored on the same basis.

During the whole monitoring period from 14/09/2013 to 30/09/2014, the project's LFG destruction facility operated under the following equipment/instrument configuration:

- 4 centrifugal blowers model 77A1.03, manufactured by Continental Industrie S.A.S powered by electric motor with nameplate power of 75 kW).
- LFG monitoring equipment/instruments:
  - LFG mass flow meter
  - LFG temperature sensor,
  - LFG pressure sensor,
  - CH_4/O_2 content gas analyzer,
  - 6 thermocouples (1 thermocouple for each installed high temperature enclosed flare in order to measure temperature in the exhaust gases of each installed flare)
  - 6 UV flame detectors (1 flame detector in each installed flare in order to monitor the operational and flame status of each one of the installed flares)
- 6 high temperature enclosed flares manufactured by Biotecnogás s.r.l.
- 2 backup captive off-grid backup electricity generators fuelled by diesel with the following specifications:

	Generator 1	Generator 2
Manufacturer	STEMAC S/A Grupos Geradores	Leon Heimer S/A
Model	GTA	40/41

Nameplate installed capacity:	450 kVA	512 kVA

- 2 electricity meters (one for measuring grid electricity consumed by the project activity and another for measuring the electricity consumption supplied from the 2 captive off-grid backup electricity generators fuelled by diesel.

Further details about monitoring instruments/equipment are included in Section D.2.

The following picture provides overview of the project activity's infrastructure:

Figure 1 – Partial view of the LFG destruction station

The CGR Paulínia landfill is regarded as a very well-designed and well-managed landfill. It applies the best practice in Brazil in terms of landfill design and operation. As established by the valid environmental and operational permits, disposed MSW is constantly covered and levelled with the use of heavy equipment (excavators, compacting equipment, etc.). Furthermore, safety requirements are defined and addressed as part of the operation of the landfill by using a preventative approach. No practice to increase the amount of methane generated at the CGR Paulínia landfill has ever been applied. While the project activity represents real improvement in terms of LFG management at the landfill (when compared to the situation prior to the implementation of the project activity (baseline scenario)), no change in terms of MSW disposal practice at the CGR Paulínia landfill was ever promoted or influenced by the implemented CDM project activity. Further details are included in Section D.2 (under details for the monitoring parameter "Management of SWDS").

During the considered monitoring period, the project activity faced events when it became temporarily out of operation due to different reasons (occurrence of previously planned or unplanned equipment maintenance/repair events, performance regular calibration events, draining of excess of condensate material from the project's LFG pipeline, identification of unexpected problems in the PLC panel, data communication problems, etc.).

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

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The below summarized temporary deviation from the applied methodology/registered monitoring plan is acknowledged as being occurred during the considered monitoring period and was

proposed as a post-registration change (PRC) under the "prior-approval" process track that was approved by the CDM-EB on 25/07/2016 (under the PRC reference number PRC-0165-001).

Due to the utilization of a single/unique flow meter for continuously measuring the flow of LFG sent to the set of flares, the project participants proposed a deviation request that, for addressing the lack of individual flow meters for each installed flare, applies a conservative approach for calculation of emission reductions by adopting inter alia the Default Value of Option A of the Methodological Tool "Project emissions from flaring" for the calculation of $PE_{flare,y}$ (in the particular case of the project activity (in which LFG is flared in low-height flares) the default value is thus selected as 0.80).

Also as a conservative approach to address the lack of individual flow meters for each one of the installed flares, a criteria to discount all emission reductions generated from the combustion of methane at the LFG flaring facility during the periods where one or more flares operated outside the specified operational parameters is applied during the considered deviation period (that encompasses the whole monitoring period), thus assuring that no emission reductions are claimed during time periods when the flares operate outside the specified operational parameters for LFG flow and temperature. Therefore, if one of the flares is not operational in accordance with the manufacturer specifications for maximum and minimum temperature during a given minute, no emission reductions are accounted for such minute.

Further details for the approved PRC process encompassing the deviation in question are available at the CDM website under the reference PRC-0165-001.

B.2.2. Corrections

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Not applicable for the considered monitoring period. There are no Corrections (in information that do not affect the project design) encompassed by the considered monitoring period that are to be submitted with this Monitoring Report as part of the request for issuance (post-registration change – issuance track).

It is however relevant to note that Corrections (in information that do not affect the project design) were previously approved under PRC-0165-001 as follows:

Ref of PRC processes so far encompassed by the project activity	Approval date	Description of the post-registration change(s) under the category "*Corrections (in information that do not affect the project design)*"
PRC-0165-001	25/07/2016 (prior-approval track)	Corrections (that do not affect the project design): - Inclusion of additional fixed (ex-ante determined) parameters as required by ACM0001 (version 13.0.0) + applicable methodological tools; - General text revisions of project description in order to fully comply with the currently applicable requirements for completing the CDM-PDD form (version 06.0) as established by the attachment document "Instructions for filling out the project design document form for CDM project activities" and to enhance/improve the project design description; - Minor text improvements (incl. review of statements and correction of previously existent typographic mistakes) in order to improve the overall project description; - Revisions in the texts referring to individual flow meters to measure

		LFG flow sent to each flare in order to adequate to the actual project's configuration (one LFG flow meter installed for each individual flare); - Revision/correction of the adopted calculation approach for the parameter "flare efficiency for minute m" ($\eta_{flare,m}$) as per the methodological tool "Project emissions from flaring"

B.2.3. Changes to the start date of the crediting period

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Not applicable for the considered and/or previous monitoring periods. There are no changes to start date of the crediting period encompassed by the considered monitoring period and/or previously approved by the CDM-EB.

In fact, no change to start date of the crediting period was ever addressed in the context of previously performed and approved post-registration changes for the project activity (PRC-0165-001).

B.2.4. Inclusion of monitoring plan

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Not applicable for the considered and/or previous monitoring periods. There is no inclusion of monitoring plan (and/or applicable methodological tools) encompassed by the considered monitoring period and/or previously approved by the CDM-EB as being applicable for the considered monitoring period.

In fact, no inclusion of monitoring plan was ever addressed in the context of previously performed and approved post-registration changes for the project activity (PRC-0165-001).

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

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Not applicable for the considered monitoring period. There are no permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied CDM baseline and monitoring methodology and/or applicable methodological tools encompassed by the considered monitoring period that are to be submitted with this Monitoring Report as part of the request for issuance (post-registration change – issuance track).

It is however relevant to note that permanent changes to the registered monitoring plan (revision of the monitoring plan) were previously approved under PRC-0165-001 as follows:

Ref of PRC processes so far encompassed by the project activity	Approval date	Description of the post-registration change(s) under the category *"Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied CDM baseline and monitoring methodology and/or applicable methodological tools"*
PRC-0165-001	25/07/2016 (prior-approval track)	- Inclusion of additional alternative approach for the determination of the amount of methane in collected LFG which is sent to the flares ($F_{CH4,sent\_flare,y}$) as per Option C of the applicable "Tool to determine the mass flow of a greenhouse gas in a gaseous stream";

		- Inclusion of the maximum operation temperature of 1,200ºC in the flare specifications and in the monitored parameter $SPEC_{flare}$;

B.2.6. Changes to project design

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Not applicable for the considered monitoring period. There are no permanent changes to the design of the project activity encompassed by the considered monitoring period that are to be submitted with this Monitoring Report as part of the request for issuance (post-registration change – issuance track).

It is however relevant to note that permanent changes to the design of the project activity were previously approved under PRC-0165-001 as follows:

Ref of PRC processes so far encompassed by the project activity	Approval date	Description of the post-registration change(s) under the category *"Permanent changes to the design of the project activity"*
PRC-0165-001	25/07/2016 (prior-approval track)	- Revision of the ex-ante estimates of GHG emission reductions to be achieved by the project activity during the 2nd 7-year crediting period by considering updated amount of annual waste to be disposed at the CGR Paulínia landfill;

B.2.7. Changes specific to afforestation or reforestation project activity

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Not applicable.

SECTION C. Description of monitoring system

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As part of the application of the designed monitoring plan valid for the 2nd 7-year crediting period, as reported in the PDD, LFG and flaring related monitoring data is automatically measured, processed and recorded with the use of related monitoring instruments/equipment, a datalogger a Programmable Logic Controller (PLC) unit and a SQL based database (with customized design and configuration) that are all integrated to a data supervisory system (SCADA) of which design and configuration are also customized to the project activity.

The monitoring equipment is presented in the next figure:

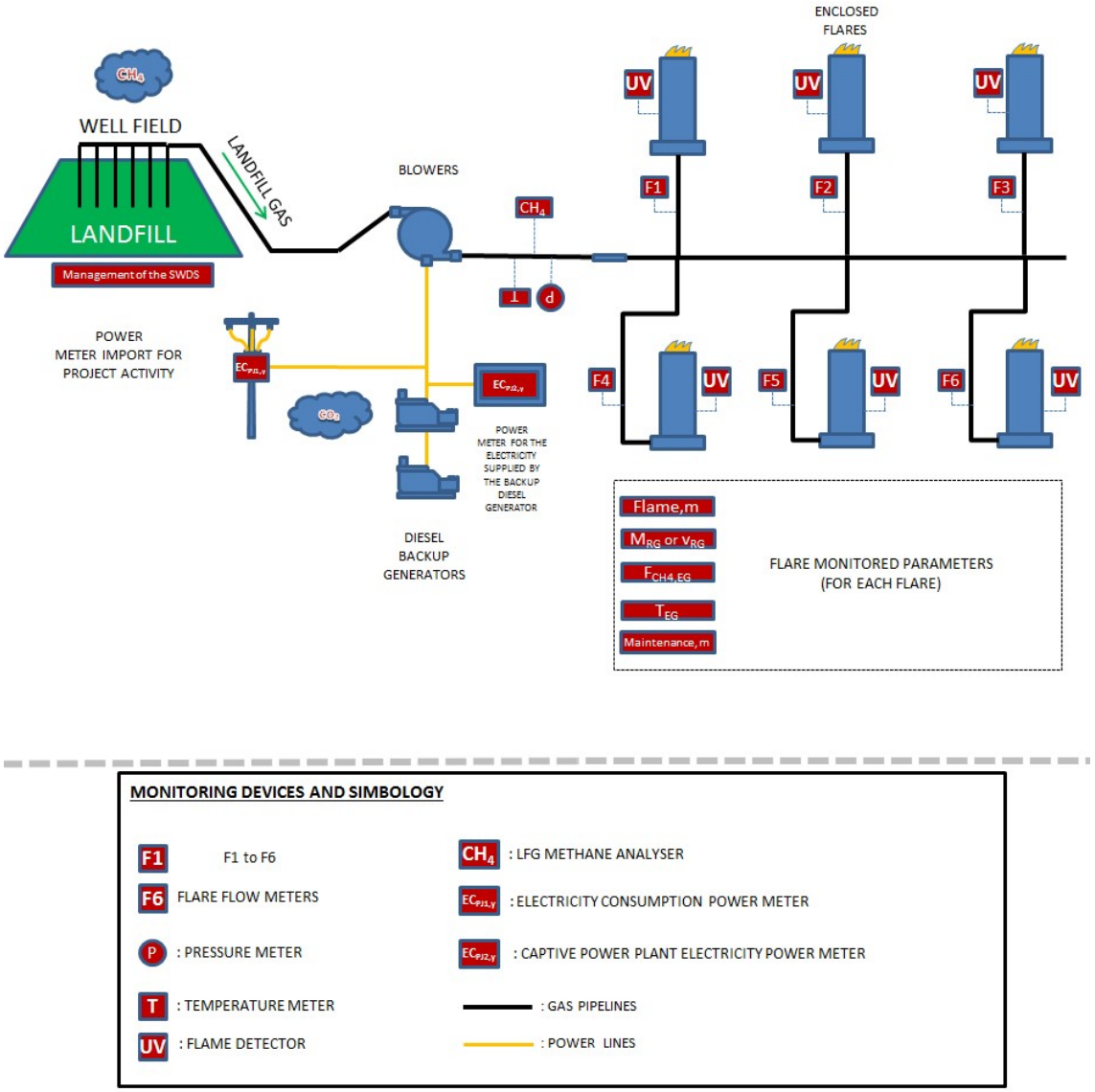

Figure 2 – Monitoring equipment

While values for related measurements are visible at the project's supervisory system (SCADA system), all continuously measured parameters (parameters related to volumetric flow of the gaseous stream, LFG CH_4 concentration, LFG temperature, LFG pressure, flare temperature, flare operating hours, electricity from the grid and electricity from diesel generators) are processed in a programmable logic controller (PLC) unit and recorded electronically in database which has the capability to aggregate, record and report collected data in the frequency range required. Every-minute recorded data is used as input data for emission reduction calculations.

Backup of recorded monitoring data is carried out every week. The monitoring instruments uncertainty levels, methods and the associated accuracy levels are presented in section D.2 of the Monitoring Report. Data records are kept and archived electronically for two years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

As part of the QA/QC procedure applicable for the operation of the project activity, recorded data are daily analyzed by consultants. If any implausible value is detected among available records, apparent or real inconsistencies are then reported in a log-book and corrective actions will be performed if required/applicable.

During the considered monitoring period, continuous measurements of LFG flow sent to each installed flare, LFG pressure, LFG temperature, LFG CH_4 content, LFG O_2 content[4], temperature of the exhaust gas in each installed flare, status of the flame detector in each installed flare, consumption of grid-sourced electricity by the project activity and consumption of electricity sourced by the backup off-grid electricity generators (fuelled by diesel) were all processed by the project's PLC unit and recorded within an every-minute frequency by the project's SQL format database.

As part of the implemented data reporting and emission reduction calculation procedures applicable for the 2nd 7-year crediting period of the project activity, one MS-Excel format spreadsheet file with monitoring records (raw-data file) is generated for each individual month.

The data file contains LFG and flaring related monitoring records for every 1-month period encompassed by the considered monitoring period, as well as data from electricity consumption by the project activity (both from the grid and from the off-grid captive backup diesel generator). Data in MS-Excel format is handled as a primary data input for the performance of emission reduction calculations (data is used as input data for the compilation of monthly emission reduction calculation spreadsheets that are enclosed to this Monitoring Report).

As per applicable documented working procedures, the project activity is managed by the Operational Director at ESTRE Ambiental S.A (under authority of the President). The Operational Director manages the Biogas Coordinator who supervises the Biogas Supervisor, which is responsible by the 4 operators, environmental assistant, welding supervision and 4 general assistants.

The Biogas Coordinator is in charge of all monitoring related activities (handling of data, preparation of the Monitoring Report and emission reduction calculation spreadsheet). The project activity is fully supported by CDM specialists (consultants) from the CDM consultancy company UniCarbo Energia e Biogás Ltda. The operation of the project activity and the application of the monitoring plan is responsibility of the Biogas Coordinator, who reports all relevant project related issues to the Operational Director (operation status of the project activity, results and events, collection and storage of monitoring data, calibration events, and maintenance of equipment). The CDM specialists (consultants) also support the project team in operational and monitoring related issues.

The diagram bellow shows the hierarchy for the project management.

[4] Continuous monitoring of LFG O_2 content is not required as per ACM0001 (version 13.0.0) + applicable methodological tools. Moreover, the monitoring plan of the PDD does not refer to monitoring of LFG O_2 contents either. However, LFG O_2 content is measured due to safety and operational requirements.

Figure 3 - ESTRE Ambiental S/A's organizational structure

Under conformance with the monitoring plan for the project activity, all the measurement instruments/equipment were subject to regular calibration (if applicable) as per manufacturer's specifications. The project's LFG coordinator is responsible for checking/confirming instrument/equipment's proper working conditions, as well as checking and storing up the calibration certificates and records. All considered calibration frequencies are in line with the manufacturer's specifications. Calibration certificates for all monitoring instruments/equipment will be kept archived during the entire 2nd 7-year crediting period and at least two years after its ending.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter:	**OX_{top_layer}**
Unit	Dimensionless
Description	Fraction of methane that would be oxidized in the top layer of the SWDS in the baseline.

Source of data	The PDD refers to the default value as per the CDM baseline and monitoring methodology ACM0001 (version 13.0.0). The value is consistent with how oxidation is accounted for in the methodological tool "Emissions from solid waste disposal sites" (version 06.0.1).
Value(s) applied	0.1
Choice of data or measurement methods and procedures	Default value as per the applied CDM baseline and monitoring methodology ACM0001 "Flaring or use of landfill gas" (version 13.0.0)
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter:	**GWP_{CH4}**
Unit	tCO_2e/tCH_4
Description	Global Warming Potential of CH_4
Source of data	The PDD refers to IPCC Fourth Assessment Report: Climate Change 2007, item 2.10.2: Direct Global Warming Potentials, Table 2.14. Available at: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html The applied value is also in accordance with the "Standard for application of the global warming potential to clean development mechanism project activities and programmes of activities for the second commitment period of the Kyoto Protocol".
Value(s) applied	25
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

<table>
<tr><td>Data/Parameter:</td><td>$SPEC_{flare}$</td></tr>
<tr><td>Unit</td><td>Temperature - °C
Flow rate - Nm³/h
Maintenance schedule - number of days</td></tr>
<tr><td>Description</td><td>Manufacturer’s flare specifications for temperature, flow rate and maintenance schedule interval.</td></tr>
<tr><td>Source of data</td><td>The PDD refers to data as per the flare manufacturer.</td></tr>
<tr><td>Value(s) applied</td><td>Flare 1 and Flare 2:
<table>
<tr><th colspan="2">Flare model: 2000 HT - $SPEC_{flare,\ Flare\ 1}$ / $SPEC_{flare,\ Flare\ 2}$</th></tr>
<tr><td>Operational LFG flow for each flare (for continuous operation):</td><td>Minimum flow: 400 Nm³/h
---
Maximum flow: 2,000 Nm³/h</td></tr>
<tr><td>Minimum flare temperature</td><td>850 °C</td></tr>
<tr><td>Maximum flare temperature</td><td>1,200 °C</td></tr>
<tr><td>Maximum duration in days between maintenance events</td><td>7 days[5]</td></tr>
</table>
Flare 3, Flare 4, Flare 5 and Flare 6:
<table>
<tr><th colspan="2">Flare model: 2500 HT - $SPEC_{flare,\ Flare\ 3}$ / $SPEC_{flare,\ Flare\ 4}$ / $SPEC_{flare,\ Flare\ 5}$ / $SPEC_{flare,\ Flare\ 6}$</th></tr>
<tr><td>Operational LFG flow for each flare (for continuous operation):</td><td>Minimum flow: 500 Nm³/h
---
Maximum flow: 2,500 Nm³/h</td></tr>
<tr><td>Minimum flare temperature</td><td>850 °C</td></tr>
<tr><td>Maximum flare temperature</td><td>1,200 °C</td></tr>
<tr><td>Maximum duration in days between maintenance events</td><td>7 days</td></tr>
</table></td></tr>
<tr><td>Choice of data or measurement methods and procedures</td><td>As established by the methodological tool “Project emissions from flaring”, the flare specifications and operational + maintenance requirements (as set/recommended by the equipment manufacturer) are documented and considered for the ex-ante determination of applicable values for the parameter $SPEC_{flare}$.</td></tr>
</table>

[5] The maximum duration in days between maintenance events has been chosen considering ESTRE preventive maintenance program which defines the frequency for checking flare equipment situation every week.

Purpose of data/parameter	Calculation of baseline emissions
Additional comments	All flare specification and operation details/requirements are based on information provided by the equipment manufacturer.

Data/Parameter	**R_u**
Unit	Pa.m3/kmol.K
Description	Universal ideal gases constant
Source of data	Default value as per the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0)
Value(s) applied	8,314
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Data is use for determination of baseline emissions
Additional comments	-

Data/Parameter:	**P_{ref}**
Unit	Pa
Description	Atmospheric pressure at reference conditions
Source of data	The PDD refers to the default value as per the "Project emissions from flaring".
Value(s) applied	101,325
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter:	**T_{ref}**
Unit	K
Description	Temperature at reference conditions

Source of data	The PDD refers to the default value as per the "Project emissions from flaring".
Value(s) applied	273.15
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter:	**MM_i**
Unit	kg/kmol
Description	Molecular mass of greenhouse gas *i*
Source of data	The PDD refers to the default value as per the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream".
Value(s) applied	As outlined in the PDD, the following value of molecular mass is applicable for CH_4 (the only GHG which is considered):
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	**-**

Compound	Structure	Molecular mass (kg/mol)
Methane	CH_4	16.04

Data/Parameter:	**MM_k**
Unit	kg/kmol
Description	Molecular mass of gas k
Source of data	The PDD refers to the default value as per the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream".
Value(s) applied	
Choice of data or measurement methods and procedures	-

Compound	Structure	Molecular mass (kg/mol)
Nitrogen	N_2	28.01

Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter:	**MM_{H2O}**
Unit	kg/kmol
Description	Molecular mass of water
Source of data	The PDD refers to the default value as per the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream".
Value(s) applied	18.0152
Choice of data or measurement methods and procedures	-
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter:	**$EF_{grid,BM,y}$**
Unit	tCO_2/MWh
Description	Build margin emission factor for the grid in year *y*
Source of data	As outlined in the PDD, the selected value is the value calculated by the DNA of Brazil and valid for year 2012.
Value(s) applied	0.2010
Choice of data or measurement methods and procedures	The build margin emission factor has been defined by the Brazilian DNA.
Purpose of data/parameter	Calculation of project emissions (due to consumption of grid-sourced electricity by the project activity).
Additional comments	-

Data/Parameter	**w_{BM}**
Unit	%
Description	Weighting of build margin emissions factor
Source of data	Applicable default value as per the "Tool to calculate the emission factor for an electricity system" (version 3.0.0)

Value(s) applied	0.75 (75%) during the 2nd 7-year crediting period
Choice of data or measurement methods and procedures	The applicable value valid for 2nd crediting period as per the "Tool to calculate the emission factor for an electricity system" (Version 3.0.0) is selected.
Purpose of data/parameter	Data is used for determination of project emissions (due to the consumption of grid electricity by the project activity).
Additional comments	-

Data/Parameter	w_{OM}
Unit	%
Description	Weighting of operating margin emissions factor
Source of data	Applicable default value as per the "Tool to calculate the emission factor for an electricity system" (version 3.0.0)
Value(s) applied	0.25 (25%) during the 2nd 7-year crediting period
Choice of data or measurement methods and procedures	The applicable value for the 2nd crediting period as per the "Tool to calculate the emission factor for an electricity system" (version 3.0.0) is selected.
Purpose of data/parameter	Data is used for determination of project emissions (due to the consumption of grid electricity by the project activity).
Additional comments	-

Ex-ante determined parameters not used in the context of ex-post determination and calculation of emission reductions achieved by the project activity:

The following ex-ante determined parameters (that are also included in the PDD) are not used for the purpose of ex-post determination of baseline emissions and project emissions achieved by the project activity during the considered monitoring period:

- Waste composition
- Efficiency of the LFG capture system that will be installed in the project activity (η_{PJ})
- Default value for model correction factor to account for model uncertainties ($\varphi_{default}$)
- Oxidation factor (reflecting the amount of methane from the considered SWDS that is oxidized in the soil (or other material covering the waste)) (OX)
- Fraction of methane in the SWDS gas (volume fraction) (F)
- Default value for the fraction of degradable organic carbon (DOC) in MSW that decomposes in the SWDS ($DOC_{f,default}$)
- Methane correction factor ($MCF_{default}$)
- Fraction of degradable organic carbon in the waste type j (weight fraction) (DOC_j)
- Decay rate for the waste type *j* (k_j)

Data for the above-listed parameters are used only in the context of ex-ante estimation of annual accumulated values for the "Amount of methane in the LFG which is flared and/or used in the project activity in year y" ($F_{CH4,PJ,y}$) (in the context of ex-ante estimation of emission reductions to be achieved by the project activity during the 2nd 7-year renewable crediting period). Due to that, details for the above-listed parameters are not included in this Section as they are not relevant in the context of determination of emission reductions achieved by the project activity during the considered monitoring period. Relevant details for such not reported parameters are included in Section B.6.2 of the PDD.

D.2. Data and parameters monitored

Data/Parameter	**Management of SWDS**
Unit	Dimensionless
Description	Management of the SWDS

Measured/calculated/ default	As per the adopted monitoring procedure for the project activity, the management of the CGR Paulínia landfill is yearly compared against the previously conceived original construction and operational design of the landfill in order to confirm that the overall management and operation of the CGR Paulínia landfill (including relevant aspects related to landfilling practice) were not modified with the unique aim to increase generation of methane on site. By performing the checking annually, it is monitored whether any practice aiming to increase methane generation in the landfill has occurred. As required by ACM0001 (version 13.0.0), any change in the management of the landfill after the implementation of the project activity should be justified by referring to applicable technical or regulatory specifications.
Source of data	A technical report regarding the operational conditions of the CGR Paulínia landfill (by taking into account required reporting of operational conditions of the landfill as required in the valid Operational Licence for the CGR Paulínia landfill landfill) was elaborated by the technical staff of ESTRE Ambiental S/A on 15/10/2014 This technical report is titled "*Relatório de Monitoramento Geotécnico*" and was submitted to the environmental agency/authority of the State of São Paulo (CETESB). The title of the technical report is translated into English language as "*Report of Geotechnical Monitoring*". Previous versions of the same report were issued by ESTRE Ambiental S/A on 15/10/2013 and 15/10/2012. As outlined in all versions of such technical report, the current design configuration and operational conditions of the CGR Paulínia landfill are under conformance with all previously conceived design and operational conditions of the landfill that were established as part of the licensing process of the landfill prior to the implementation of the project activity.

Value(s) of monitored parameter	The content of the issued technical reports confirms that the previously conceived original design of the landfill (dated prior to the implementation of the project activity) has not modified during the period from 14/09/2006 (date when the project activity started to operate) until September 2020. These reports confirm that no practices to deliberately increase methane generation at the CGR Paulínia landfill have occurred (when compared to management and MSW landfilling practices prior to implementation of the project activity). Aspects, conditions and circumstances related to management of the landfill (e.g. waste disposal, waste covering, waste compacting, management of leachate, draining of rainwater, etc.) were not changed with an aim to increase methane generation on site. It is relevant to note that MSW management business (collection and disposal of MSW) in Brazil has its own economics, dynamics, policies and related regulations. That makes MSW disposal activity for the CGR Paulínia landfill and other similar landfills in Brazil completely independent from the CDM mechanism and/or revenues of commercialization of CERs generated by project based destruction of methane in landfills. In the particular case of the CGR Paulínia landfill, it is important to note that this landfill was designed and it has operated *inter alia* as per terms and conditions from MSW disposal of the public service concession contracts previously established with the Administration of the Municipality of Campinas and other Municipalities in the region. Moreover, the design and operation of this particular landfill is also under conformance with previously defined terms and conditions of the environmental licensing of the site that are regularly monitored by the competent environmental authority from São Paulo State (CETESB). While the occurrence of changes in the quantitative condition related to MSW disposal in this landfill are completely independent from the CDM project activity, the project activity per se does not represent any incentive for promoting a change in the management of the landfill in order to increase the amount of methane generated in the site. Furthermore, as outlined in the PDD, the project activity does not encompass any MSW management related measures. Currently, there is still no climate change of waste management policy in Brazil which would provide an incentive or a mandate to have MSW being disposed in landfills with better/improved LFG collection / destruction systems (such as the project's LFG collection and destruction system currently implemented at the CGR Paulínia landfill).
Monitoring equipment	Not applicable. No measuring equipment is used for monitoring management of the CGR Paulínia landfill.
Measuring/reading/recording frequency	Annual checking is to be performed.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at ESTRE Ambiental S/A in accordance with detailed working instructions that are included in the company's ISO 14001 certified quality management and control (QA/QC).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	**$O_{pj,h}$**
Unit	-
Description	Operation of the equipment that consumes the LFG
Measured/calculated/ default	As per the PDD, "*(…) For each equipment unit j using the LFG monitor that the plant is operating in hour h by the monitoring parameter below:* • *Temperature. Determine the location for temperature measurements and minimum operational temperature based on manufacturer's specifications of the burning equipment. The flare temperature meter (thermocouple) is located at the middle third of each of the 6 flares at the flare system. The minimum flare temperature which guarantees the operation of the equipment is 850ºC.* *$O_{pj,h}$=0 when:* • *One or more temperature measurements are missing or below the minimum threshold in hour h (instantaneous measurements are made at least every minute);* *Otherwise, $O_{pj,h}$=1* *The accuracy and uncertainty of the monitoring instrument will be in accordance with manufacturer specifications. (…)*" In the particular case of the project activity, the operation of each one of the flares is monitored continuously on the basis of measurements of temperature in the exhaust gas of the flare in question (measurements performed by the installed 6 thermocouples (1 thermocouple for each enclosed flare)).
Source of data	The temperature in the exhaust gas of the enclosed flares is continuously measured as part of the operation of the project activity by applying appropriate monitoring instruments (6 thermocouples) (with recordable electronic signal).
Value(s) of monitored parameter	While measurements of temperature in the exhaust gas of the enclosed flares are performed by installed 6 thermocouples (one for each individual installed flare), the monitoring parameter $O_{pj,h}$ is thus measured, recorded and reported on the basis of the following sub-parameters: - $O_{pj,h,flare-1}$: Operation of the Flare 1 - $O_{pj,h,flare-2}$: Operation of the Flare 2 - $O_{pj,h,flare-3}$: Operation of the Flare 3 - $O_{pj,h,flare-4}$: Operation of the Flare 4 - $O_{pj,h,flare-5}$: Operation of the Flare 5 - $O_{pj,h,flare-6}$: Operation of the Flare 6 The monthly emission reduction calculation spreadsheets (that are enclosed to this Monitoring Report) include all records for $O_{pj,h,flare-1}$, $O_{pj,h,flare-2}$, (…), $O_{pj,h,flare-6}$ during the considered monitoring period. Measurement data is recorded and reported with an every-minute frequency.

Monitoring equipment	Continuous measurements are performed by thermocouples that are installed in each one of the 6 high temperature enclosed flares. The specifications and calibration details for the installed thermocouples are presented below in the applicable table for the monitoring parameter "Temperature in the exhaust gas of the enclosed flare in minute *m*" ($T_{EG,m}$).
Measuring/reading/recording frequency	Continuous measurements of temperature in the exhaust gas of the enclosed flares are recorded and reported with an every-minute frequency. Based on such measurement records, values of $O_{pj,h}$ for each installed enclosed flare ($O_{pj,h,flare-1}$, $O_{pj,h,flare-2}$:, (…), $O_{pj,h,flare-6}$) are also determined and reported with an every minute frequency.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed ESTRE Ambiental S/A. in accordance with detailed working instructions that are included in the company's ISO 14001 certified quality management.
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Tool to determine the mass flow of a greenhouse gas in a gaseous stream:

Data/Parameter	**$V_{t,wb}$**
Unit	m^3 wet gas/h
Description	Volumetric flow of the gaseous stream in time interval t on a wet basis
Measured/calculated/ default	Continuously measured by an installed LFG flow meter
Source of data	Measured as part of the operation of the project activity by applying appropriate monitoring instrument (LFG flow meter) (with recordable electronic signal).
Value(s) of monitored parameter	The monthly emission reduction calculation spreadsheets (that are enclosed to this Monitoring Report) include all records of measurement data of LFG flow sent to the installed high temperature enclosed flares during the considered monitoring period. Measurement data is recorded and reported with an every-minute frequency.

Monitoring equipment	Measurements are performed by an appropriate LFG flow meter that is installed in a section of the LFG pipeline between the centrifugal blowers and the high temperature enclosed flares. *Specifications and calibration details for the installed LFG flow meter:* - Manufacturer: ABB - Model: S-4000 - Accuracy: +/-0.5% - Serial Number: 240297184/X001 - Calibration frequency (as specified by the monitoring methodology/tool and/or in the PDD): The PDD establishes that "*Periodic calibration against a primary device provided by an independent accredited laboratory is mandatory. The calibration frequency of this monitoring equipment should be in accordance with manufacturer's specifications.".* - Calibration frequency (as per the application of the monitoring plan and recommendations from the equipment manufacturer): Calibration events are performed every 3 years - Dates for performed calibration events valid for the considered monitoring period: 07/02/2011 and 06/02/2014 - Validity of the performed calibration events: the calibration event performed on 07/02/2011 is valid until 07/02/2014 (3 years) and the calibration event performed on 06/02/2014 is valid until 06/02/2017 (3 years) - Entity/company responsible for performing the calibration events: the calibration event of 07/02/2011 was performed by Run Time Automação Industrial & Metrologia and the calibration event of 06/02/2014 was performed by CSouza Dias Instrumentação e Serviços Tecnológicos
Measuring/reading/recording frequency	Continuous measurements are recorded and reported with an every-minute frequency.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at Estre Ambiental S/A in accordance with detailed working instructions that are included in the company's ISO 14001 certified quality management and control (QA/QC).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	The design of the installed LFG flow meter ensures that measurement data is automatically converted and recorded in normal cubic meters per hour (Nm^3/h). Due to that, measurements of LFG pressure and LFG temperature are not required for performing GHG calculations (see further details in Section E.1).

Data/Parameter	$\mathbf{V_{i,t,wb}}$
Unit	m^3 CH_4/m^3 wet gas

Description	Volumetric fraction of greenhouse gas methane in a hourly time interval *t* on a wet basis
Measured/calculated/ default	Continuously measured by continuous CH_4 content gas analyzer.
Source of data	Measured as part of the operation of the project activity by applying appropriate monitoring instruments (CH_4 content gas analyser) (with recordable electronic signal).
Value(s) of monitored parameter	The monthly emission reduction calculation spreadsheets (that are enclosed to this Monitoring Report) include measurement data for $v_{i,t,wb}$ that are recorded and reported with an every-minute frequency.
Monitoring equipment	Measurements are performed by installed continuous CH_4 content gas analyser for which the LFG sample collecting point is located in the main LFG pipeline in a section between the centrifugal blowers and the high temperature enclosed flares. *Specifications and calibration details for the installed continuous CH_4 content gas analyzer:* - Manufacturer: SIEMENS - Model: ULTRAMAT 23 - Accuracy: ±0.5% - Serial Number: N1-U4-0790 - Calibration frequency (as per the application of the monitoring plan and recommendations from the equipment manufacturer): Calibration events are performed every year. - Dates for performed calibration events valid for the considered monitoring period: 22/12/2012, 20/12/2013 and 19/12/2014 - Validity of the performed calibration events: the calibration event performed on 22/12/2012 is valid until 22/12/2013 (1 year), the calibration event performed on 20/12/2013 is valid until 20/12/2014 (1 year) and the calibration event performed on 19/12/2014 is valid until 19/12/2015 (1 year) - Entity/company responsible for performing the calibration events: The calibration event of 22/12/2012 was performed by Run Time Automação Industrial & Metrologia and the calibration events of 20/12/2013 and 19/12/2014 were both performed by CSouza Dias Instrumentação e Serviços Tecnológicos. Calibration events valid for the considered monitoring period were performed by using certified span gas cylinders with a known CH_4 composition. Certified span gases utilized for performing the calibration events valid for the considered monitoring period: - Gas cylinders with a calibration mixture of 50.01 mol/mol of CH_4, 40.09 mol/mol CO_2 and 2.011 mol/mol O_2: cylinder n° 479, certificate number 41019406, supplied by White Martins Gases Industriais Ltda. - Gas cylinders with a calibration mixture of 53.96 mol/mol of CH_4, 20.00 mol/mol CO_2 and 2.029 mol/mol O_2: cylinder n° 521822, certificate number 40834922, supplied by White Martins Gases Industriais Ltda.
Measuring/reading/recording frequency	Continuously measurements are recorded/reported every minute.
Calculation method (if applicable)	Not applicable.

QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at ESTRE Ambiental S/A in accordance with detailed working instructions that are included in the company's ISO 14001 certified quality management and control (QA/QC).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	**T_t**
Unit	K
Description	Temperature of the gaseous stream in time interval *t*
Measured/calculated/ default	Continuously measured by LFG temperature sensor. Measurements are primarily recorded and reported in ^oC. Recorded/reported data is converted into Kelvin and data is also reported in this unit, thus meeting the related monitoring requirement as per the PDD.
Source of data	Measured as part of the operation of the project activity by applying appropriate monitoring instruments (temperature sensor) (with recordable electronic signal).
Value(s) of monitored parameter	The monthly emission reduction calculation spreadsheets (that are enclosed to this Monitoring Report) include measurement data for T_t that are recorded and reported with an every-minute frequency.

Monitoring equipment	Measurements are performed by installed LFG temperature sensor that is installed in the main LFG pipeline in a section between the centrifugal blowers and the high temperature enclosed flares. *Specifications and calibration details for the LFG temperature sensor:* - Manufacturer: ABB - Model: TSP321 - Accuracy: ±0.35% - Serial Number (S/N): 210000516854001 - Calibration frequency: as specified by the monitoring methodology/tool): Periodically calibrated by an officially accredited entity. - Calibration frequency (as per the application of the monitoring plan): every 3 years - Date for performed calibration events valid for the considered monitoring period: 07/02/2011 and 06/02/2014 - Validity of the performed calibration events: The calibration event of 07/02/2011 is valid until 07/02/2014 (3 years) and the calibration event of 06/02/2014 is valid until 06/02/2017 (3 years). - Entity/company responsible for performing the calibration events: the calibration event of 07/02/2011 was performed by Run Time Automação Industrial & Metrologia and the calibration event of 06/02/2014 was performed by CSouza Dias Instrumentação e Serviços Tecnológicos
Measuring/reading/recording frequency	Continuously measurements are recorded/reported every minute.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at Estre Ambiental S/A in accordance with detailed working instructions that are included in the company's 14001 certified quality management and control (QA/QC).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	In accordance with the PDD, since measurements of LFG flow are automatically converted and recorded in normalized cubic meters (by considering standard temperature and pressure (STP) conditions), monitoring of "Pressure of the gaseous stream in time interval *t*" (P_t) and "Temperature of the gaseous stream in time interval *t"* (T_t) are not required.

Data/Parameter	**P_t**
Unit	Pa
Description	Pressure of the LFG stream in time interval *t*
Measured/calculated/ default	Continuously measured by LFG pressure sensor.
Source of data	Measured as part of the operation of the project activity by applying appropriate monitoring instruments (pressure sensor) (with recordable electronic signal).

Value(s) of monitored parameter	Measurement data for P_t that are recorded with an every-minute frequency are available in the raw data file which serves as input data for the monthly emission reductions calculation spreadsheets. While monitoring records of P_t are not used in the calculations of emission reductions achieved by the project activity during the considered monitoring period, the monthly emission reductions calculation spreadsheets thus not present any monitoring records for this parameter.
Monitoring equipment	Measurements are performed by installed LFG pressure sensor that is installed in the main LFG pipeline in a section between the centrifugal blowers and the high temperature enclosed flares. *Specifications and calibration details for the LFG pressure sensor:* - Manufacturer: ABB - Model: 2600T - Accuracy: ±0.075% - Serial Number: 6410001002 - Calibration frequency (as specified by the monitoring methodology/tool): Periodically calibrated by an officially accredited entity - Calibration frequency (as per the application of the monitoring plan): every 3 years - Date for performed calibration events valid for the considered monitoring period: 07/02/2011 and 06/02/2014 - Validity of the performed calibration events: The calibration event of 07/02/2011 is valid until 07/02/2014 (3 years) and the calibration event of 06/02/2014 is valid until 06/02/2017 (3 years). - Entity/company responsible for performing the calibration events: the calibration event of 07/02/2011 was performed by Run Time Automação Industrial & Metrologia and the calibration event of 06/02/2014 was performed by CSouza Dias Instrumentação e Serviços Tecnológicos
Measuring/reading/recording frequency	Continuously measurements are recorded/reported every minute.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at Estre Ambiental S/A in accordance with detailed working instructions that are included in the company's ISO 14001 certified quality management and control (QA/QC).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	In accordance with the PDD, since measurements of LFG flow are automatically converted and recorded in normalized cubic meters (by considering standard temperature and pressure (STP) conditions), monitoring of "Pressure of the gaseous stream in time interval *t*" (P_t) and "Temperature of the gaseous stream in time interval *t"* (T_t) are not required.

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

Data/Parameter	**$EF_{grid,CM,y}$**
Unit	tCO_2/MWh
Description	Combined margin emission factor for the grid in year y
Measured/calculated/ default	Calculated as the weighted average of the dispatch data analysis OM (Operating Margin) and the BM (Build margin).
Source of data	The selected annual values for $EF_{grid,CM,y}$ valid for years 2013 and 2014 are calculated as the weighted averages of the operating margin and build margin emission factors. To weight these two factors, the default values applicable to both for the 2nd crediting period are applied. The values of $EF_{grid,CM,y}$ valid for the considered monitoring period are thus obtained as follows: $EF_{grid,CM,y} = w_{OM} * EF_{grid,OM,y} + w_{BM} * EF_{grid,BM,y}$
Value(s) of monitored parameter	0.2991 tCO_2/MWh (year 2013) 0.2967 tCO_2/MWh (year 2014)
Monitoring equipment	Not applicable
Measuring/reading/recording frequency	Values are calculated annually.
Calculation method (if applicable)	Values applicable for the years of 2013 and 2014 are calculated by considering the applicable guidance of the "Tool to calculate the emission factor for an electricity system".
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at ESTRE Ambiental S/A in accordance with detailed working instructions that are included in the company's ISO 14001 certified quality management and control (QA/QC) (EMS).
Purpose of data/parameter	Calculation of project emissions (due to consumption of grid-sourced electricity by the project activity)
Additional comments	-

Data/Parameter	**$EF_{grid,OM,y}$**
Unit	tCO_2/MWh
Description	Operating margin emission factor for the grid in year *y*
Measured/calculated/ default	Calculated (based on official monthly values as calculated and published by the DNA of Brazil).

Source of data	Selected average annual values of $EF_{grid,OM,y}$ valid for years 2013 and 2014 are calculated by the DNA of Brazil and are made publicly available at the website of the DNA of Brazil: https://antigo.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/textogeral/emissao_despacho.html
Value(s) of monitored parameter	0.5932 tCO_2/MWh (year 2013) 0.5837 tCO_2/MWh (year 2014)
Monitoring equipment	Not applicable
Measuring/reading/recording frequency	Values are calculated annually.
Calculation method (if applicable)	Values applicable for year 2013 and year 2014 are calculated by the DNA of Brazil as per applicable guidance of the calculation method "dispatch data analysis operating margin CO_2 emission factor" of the "Tool to calculate the emission factor for an electricity system".
QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at Estre Ambiental S/A in accordance with detailed working instructions that are included in the company's ISO 14001 certified quality management and control (QA/QC).
Purpose of data/parameter	Calculation of project emissions (due to consumption of grid-sourced electricity by the project activity).
Additional comments	-

Data/Parameter	**$TDL_{j,y}$**
Unit	-
Description	Average technical transmission and distribution losses for providing electricity to source j in year y
Measured/calculated/ default	Default value is selected.
Source of data	Default value as per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" is selected.
Value(s) of monitored parameter	20%)
Monitoring equipment	Not applicable
Measuring/reading/recording frequency	Annually. For the considered monitoring period, the default value as per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" is selected.
Calculation method (if applicable)	Not applicable.

QA/QC procedures	Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at ESTRE Ambiental S/A in accordance with detailed working instructions that are included in the company's ISO 14001 certified quality management and control (QA/QC).
Purpose of data/parameter	Calculation of project emissions (due to consumption of grid-sourced electricity by the project activity)
Additional comments	-

Data/Parameter	**$EG_{EC1,y} = EC_{PJ1,y}$**
Unit	MWh/y
Description	Quantity of electricity consumed from the grid by the project activity during the year y
Measured/calculated/ default	Continuously measured by electricity meter.
Source of data	Measured as part of the operation of the project activity by applying appropriate monitoring instrument (electricity meter).
Value(s) of monitored parameter	Monthly records of grid-sourced electricity consumption valid for the considered monitoring period:

Month	Amount of consumed grid electricity (MWh)
14 Sep. 2013 to 30 Sep. 2013	48.891
Oct. 2013	88.489
Nov. 2013	86.376
Dec. 2013	86.985
Jan. 2014	81.160
Feb. 2014	73.977
Mar. 2014	80.643
Apr. 2014	79.142
May. 2014	83.526
Jun 2014	80.099
Jul. 2014	76.595
Aug. 2014	72.240
Sep. 2014	68.352

Monitoring equipment	During the considered monitoring period, measurements of $EC_{PJ1,y}$ were performed by 3 different electricity meters of the same model which were used alternately. *Specifications and calibration details for the installed electricity meters:* Electricity meter 01 (installed during the period from 14/09/2013 to 16/10/2013 within the considered monitoring period): - Manufacturer: CIBER - Model: UPD200-2480M - Accuracy: ±0.5% - Serial Number: 40964201180 Electricity meter 02 (installed during the period from 16/10/2013 to 25/09/2014 within the considered monitoring period): - Manufacturer: CIBER - Model: UPD200-2480M - Accuracy: ±0.5% - Serial Number: 40962200099 Electricity meter 03 (installed during the period from 25/09/2014 to 30/09/2014 within the considered monitoring period): - Manufacturer: CIBER - Model: UPD200-2480M - Accuracy: ±0.5% - Serial Number: 40964200869 Calibration requirements for Electricity meter 01, 02 and 03: - Calibration frequency (as specified by the monitoring methodology/tool): As per the PDD, "*(...) Electricity meter will be subject to regular (in accordance with stipulation of the meter supplier) maintenance and testing to ensure accuracy. Periodical calibration as per manufacturer specifications to ensure validity of data measured.* *The readings will be double checked by the electricity distribution company.* *The calibration frequency of this monitoring equipment should be according to the manufacturer's specifications*.". - Calibration frequency (as per the recommendation of the meter manufacturer): it is important to note that the installed meters are approved/certified by INMETRO (The Brazilian national authority for metrology and standardization issues), and they are thus in conformance with INMETRO's requirements for maintenance and testing of electricity meters. According to the instrument manufacturer, the meters are to be calibrated every year. An yearly calibration frequency was thus adopted. - Date of valid calibration events: Electricity meter 01: calibration event dated 22/10/2012 performed by Run Time Automação Industrial & Metrologia Electricity meter 02: calibration event dated 27/09/2013 performed by IPT – Instituto de Pesquisas Tecnológicas Electricity meter 03: calibration event dated 18/09/2014 performed by IPT – Instituto de Pesquisas Tecnológicas - Validity of the performed calibration events: Electricity meter 01: the calibration event dated 22/10/2012 is valid until 22/10/2013 (1 year) Electricity meter 02: the calibration event dated 27/09/2013

	is valid until 27/09/2014 (1 year) Electricity meter 03: the calibration event dated 18/09/2014 is valid until 18/09/2015 (1 year)
Measuring/reading/recording frequency	Continuously measurements are recorded/reported every minute.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at ESTRE Ambiental S/A in accordance with detailed working instructions that are included in the company's ISO 14001 certified quality management and control (QA/QC).
Purpose of data/parameter	Calculation of project emissions (due to consumption of grid-sourced electricity by the project activity).
Additional comments	-

Data/Parameter	**$EG_{EC2,y} = EC_{PJ2,y}$**
Unit	MWh/y
Description	Quantity of electricity consumed from diesel generators by the project activity during the year y
Measured/calculated/ default	Continuously measured by electricity meter.
Source of data	Measured as part of the operation of the project activity by applying appropriate monitoring instrument (electricity meter).
Value(s) of monitored parameter	Monthly records of electricity sourced by the 2 installed backup diesel generators valid for the considered monitoring period:

Month	Amount of consumed electricity sourced by the diesel generator (MWh)
14 Sep. 2013 to 30 Sep. 2013	0.000
Oct. 20313	0.000
Nov. 2013	0.290
Dec. 2013	0.271
Jan. 2014	0.000
Feb. 2014	0.000
Mar. 2014	0.134
Apr. 2014	0.000
May. 2014	0.000
Jun 2014	0.000
Jul. 2014	0.028
Aug. 2014	0.000
Sep. 2014	0.162

Monitoring equipment	During the considered monitoring period, measurements of EGEC2,y were performed by 3 different electricity meters of the same model which were used alternately. Specifications and calibration details for the installed electricity meters: Electricity meter 04 (installed during the period from 14/09/2013 to 16/10/2013 within the considered monitoring period): - Manufacturer: CIBER - Model: UPD200-2480M - Accuracy: ±0.5% - Serial Number: 40962200002 Electricity meter 05 (installed during the period from 16/10/2013 to 25/09/2014 within the considered monitoring period): - Manufacturer: CIBER - Model: UPD200-2480M - Accuracy: ±0.5% - Serial Number: 40991700175 Electricity meter 06 (installed during the period from 25/09/2014 to 30/09/2014 within the considered monitoring period): - Manufacturer: CIBER - Model: UPD200-2480M - Accuracy: ±0.5% - Serial Number: 40962200082 Calibration requirements for Electricity meter 04, 05 and 06: - Calibration frequency (as specified by the monitoring methodology/tool): As per the PDD, "(...) Calibration of instrument as per manufacturer specifications to ensure validity of data measured. The calibration frequency of this monitoring equipment should be according to the manufacturer's specifications.". - Calibration frequency (as per the recommendation of the meter manufacturer): it is important to note that the installed meters are approved/certified by INMETRO (The Brazilian national authority for metrology and standardization issues), and they are thus in conformance with INMETRO's requirements for maintenance and testing of electricity meters. According to the instrument manufacturer, the meters are to be calibrated every year. An yearly calibration frequency was thus adopted. - Date of valid calibration events: Electricity meter 04: calibration event dated 22/10/2012 performed by Run Time Automação Industrial & Metrologia Electricity meter 05: calibration event dated 27/09/2013 performed by IPT – Instituto de Pesquisas Tecnológicas Electricity meter 06: calibration event dated 17/09/2014 performed by IPT – Instituto de Pesquisas Tecnológicas - Validity of the performed calibration events: Electricity meter 04: the calibration event dated 22/10/2012 is valid until 22/10/2013 (1 year) Electricity meter 05: the calibration event dated 27/09/2013 is valid until 27/09/2014 (1 year)

	Electricity meter 06: the calibration event dated 17/09/2014 is valid until 17/09/2015 (1 year)
Measuring/reading/recording frequency	Continuously measurements are recorded/reported every minute.
Calculation method (if applicable)	Not applicable.
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at Estre Ambiental S/A in accordance with detailed working instructions that are included in the company's ISO 14001 certified quality management and control (QA/QC).
Purpose of data/parameter	Calculation of project emissions (due to consumption of electricity sourced by the backup diesel generators).
Additional comments	-

Methodological tool "Project emissions from flaring"

Data/Parameter	**$T_{EG,m}$**
Unit	^{o}C
Description	Temperature in the exhaust gas of the enclosed flare in minute *m*
Measured/calculated/ default	Continuously measured by thermocouples installed in the 6 enclosed flares (one thermocouple for each installed high temperature enclosed flare).
Source of data	Measured as part of the operation of the project activity by applying appropriate monitoring instruments (thermocouples) (with recordable electronic signal).
Value(s) of monitored parameter	Values for each one of the installed 6 high temperature enclosed flares are reported in the monthly emission reduction calculation spreadsheets (that are enclosed to this Monitoring Report). Measurement data is recorded and reported with an every-minute frequency. While measurements are performed by 6 thermocouples (one thermocouple installed in each individual installed flare), the monitoring parameter $T_{EG,m}$ is measured, recorded and reported on the basis of the following sub-parameters: - $T_{EG,m,flare-1}$: Temperature in the exhaust gas of Flare 1 - $T_{EG,m,flare-2}$: Temperature in the exhaust gas of Flare 2 - $T_{EG,m,flare-3}$: Temperature in the exhaust gas of Flare 3 - $T_{EG,m,flare-4}$: Temperature in the exhaust gas of Flare 4 - $T_{EG,m,flare-5}$: Temperature in the exhaust gas of Flare 5 - $T_{EG,m,flare-6}$: Temperature in the exhaust gas of Flare 6

Monitoring equipment	*Specifications and calibration details for the installed/utilized thermocouples:* *Thermocouple used for measuring $T_{EG,m,flare-1}$ (Flare 1):* - Manufacturer: ELSI - Model: type S - Accuracy: [2.704 + (0.0025 x measured temperature)] ℃, if measured temperature is equal or higher than 600℃ - Serial Number: 118583 - Calibration frequency (as specified by the monitoring methodology/tool): periodically calibrated by an officially accredited entity - Calibration frequency (as per the application of the monitoring plan): yearly - Calibration Dates: 22/12/2012 (performed by Run Time Automação Industrial & Metrologia), 20/12/2013 (performed by CSouza Dias Instrumentação e Serviços Tecnológicos) and 19/12/2014 (performed by CSouza Dias Instrumentação e Serviços Tecnológicos - Validity of the performed calibration events: The calibration event dated 22/12/2012 is valid until 22/12/2013 (1 year), the calibration event dated 20/12/2013 is valid until 20/12/2014 (1 year) and the calibration event dated 19/12/2014 is valid until 19/12/2015 (1 year). *Thermocouple used for measuring $T_{EG,m,flare-2}$ (Flare 2):* - Manufacturer: ELSI - Model: type S - Accuracy: [2.704 + (0.0025 x measured temperature)] ℃, if measured temperature is equal or higher than 600℃ - Serial Number: 11-09/5207 - Calibration frequency (as specified by the monitoring methodology/tool): periodically calibrated by an officially accredited entity - Calibration frequency (as per the application of the monitoring plan): yearly - Calibration Dates: 22/12/2012 (performed by Run Time Automação Industrial & Metrologia), 20/12/2013 (performed by CSouza Dias Instrumentação e Serviços Tecnológicos) and 19/12/2014 (performed by CSouza Dias Instrumentação e Serviços Tecnológicos - Validity of the performed calibration events: The calibration event dated 22/12/2012 is valid until 22/12/2013 (1 year), the calibration event dated 20/12/2013 is valid until 20/12/2014 (1 year) and the calibration event dated 19/12/2014 is valid until 19/12/2015 (1 year). *Thermocouple used for measuring $T_{EG,m,flare-3}$ (Flare 3):* - Manufacturer: ELSI - Model: type S - Accuracy: [2.704 + (0.0025 x measured temperature)] ℃, if measured temperature is equal or higher than 600℃ - Serial Number: 05-06/0619 - Calibration frequency (as specified by the monitoring methodology/tool): periodically calibrated by an officially accredited entity - Calibration frequency (as per the application of the monitoring plan): yearly - Calibration Dates: 22/12/2012 (performed by Run Time Automação Industrial & Metrologia), 20/12/2013 (performed by CSouza Dias Instrumentação e Serviços Tecnológicos) and 19/12/2014 (performed by CSouza Dias Instrumentação e Serviços Tecnológicos

	- Validity of the performed calibration events: The calibration event dated 22/12/2012 is valid until 22/12/2013 (1 year), the calibration event dated 20/12/2013 is valid until 20/12/2014 (1 year) and the calibration event dated 19/12/2014 is valid until 19/12/2015 (1 year). *Thermocouple used for measuring $T_{EG,m,flare-4}$ (Flare 4):* - Manufacturer: ELSI - Model: type S - Accuracy: [2.704 + (0.0025 x measured temperature)] ℃, if measured temperature is equal or higher than 600℃ - Serial Number: 11-09/5208 - Calibration frequency (as specified by the monitoring methodology/tool): periodically calibrated by an officially accredited entity - Calibration frequency (as per the application of the monitoring plan): yearly - Calibration Dates: 22/12/2012 (performed by Run Time Automação Industrial & Metrologia), 20/12/2013 (performed by CSouza Dias Instrumentação e Serviços Tecnológicos) and 19/12/2014 (performed by CSouza Dias Instrumentação e Serviços Tecnológicos - Validity of the performed calibration events: The calibration event dated 22/12/2012 is valid until 22/12/2013 (1 year), the calibration event dated 20/12/2013 is valid until 20/12/2014 (1 year) and the calibration event dated 19/12/2014 is valid until 19/12/2015 (1 year). *Thermocouple used for measuring $T_{EG,m,flare-5}$ (Flare 5):* - Manufacturer: ELSI - Model: type S - Accuracy: [2.704 + (0.0025 x measured temperature)] ℃, if measured temperature is equal or higher than 600℃ - Serial Number: 11-09/5209 - Calibration frequency (as specified by the monitoring methodology/tool): periodically calibrated by an officially accredited entity - Calibration frequency (as per the application of the monitoring plan): yearly - Calibration Dates: 22/12/2012 (performed by Run Time Automação Industrial & Metrologia), 20/12/2013 (performed by CSouza Dias Instrumentação e Serviços Tecnológicos) and 19/12/2014 (performed by CSouza Dias Instrumentação e Serviços Tecnológicos - Validity of the performed calibration events: The calibration event dated 22/12/2012 is valid until 22/12/2013 (1 year), the calibration event dated 20/12/2013 is valid until 20/12/2014 (1 year) and the calibration event dated 19/12/2014 is valid until 19/12/2015 (1 year). *Thermocouple used for measuring $T_{EG,m,flare-6}$ (Flare 6):* - Manufacturer: ELSI - Model: type S - Accuracy: [2.704 + (0.0025 x measured temperature)] ℃, if measured temperature is equal or higher than 600℃ - Serial Number: 08-12/64188 - Calibration frequency (as specified by the monitoring methodology/tool): periodically calibrated by an officially accredited entity - Calibration frequency (as per the application of the monitoring plan): yearly - Calibration Dates: 30/08/2013 (performed by Run Time Automação Industrial & Metrologia), 20/12/2013 (performed by CSouza Dias

	Instrumentação e Serviços Tecnológicos) and 19/12/2014 (performed by CSouza Dias Instrumentação e Serviços Tecnológicos - Validity of the performed calibration events: The calibration event dated 30/08/2013 is valid until 30/08/2014 (1 year), the calibration event dated 20/12/2013 is valid until 20/12/2014 (1 year) and the calibration event dated 19/12/2014 is valid until 19/12/2015 (1 year).
Measuring/reading/recording frequency	Continuously measurements are recorded/reported every minute.
Calculation method (if applicable)	-
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at Estre Ambiental S/A in accordance with detailed working instructions that are included in the company's 14001 certified quality management and control (QA/QC).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	-

Data/Parameter	**$Flame_m$**
Unit	Flame on or Flame off
Description	Flame detection of flare in the minute m
Measured/calculated/ default	Continuously measured by Ultra violet (UV) flame detectors (one UV flame detector for each installed high temperature enclosed flare).
Source of data	For each one of the flares, whenever flame is detected in the flare, flame status "*on*" or "1" value is attributed. Whenever no flame is detected in the flare, flame status "*off*" or "0" is attributed.
Value(s) of monitored parameter	Values for each one of the installed 6 high temperature enclosed flares are reported in the monthly emission reduction calculation spreadsheets (that is enclosed to this Monitoring Report). Measurement data is recorded and reported with an every-minute frequency. While measurements are performed by 6 UV flame detectors (one UV flame detector installed in each individual installed flare), the monitoring parameter $Flame_m$ is thus measured, recorded and reported on the basis of the following sub-parameters: - $Flame_{m,flare-1}$: Flame detection in Flare 1 - $Flame_{m,flare-2}$: Flame detection in Flare 2 - $Flame_{m,flare-3}$: Flame detection in Flare 3 - $Flame_{m,flare-4}$: Flame detection in Flare 4 - $Flame_{m,flare-5}$: Flame detection in Flare 5 - $Flame_{m,flare-6}$: Flame detection in Flare 6

Monitoring equipment	6 UV flame detectors (one UV flame detector installed in each individual installed flare). *Specifications of the installed/utilized UV Flame detectors:* - Manufacturer: Krom Schroder - Model: UVS6 - Calibration frequency: No calibration event is required as the equipment has a self-checking function.
Measuring/reading/recording frequency	Continuously measurements are recorded/reported every minute.
Calculation method (if applicable)	Not applicable
QA/QC procedures	Monitoring equipment/instruments are calibrated and maintained as per instrument specifications and/or recommendations of manufacturer. Procedures related to collection/gathering, recording, storing and reporting of monitoring data for the project activity are performed at ESTRE Ambiental S/A in accordance with detailed working instructions that are included in the company's ISO 14001 certified quality management and control (QA/QC).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	Not applicable

Data/Parameter	**$Maintenance_y$**
Unit	Calendar dates
Description	Maintenance events completed in year *y*
Measured/calculated/ default	-
Source of data	Maintenance logs
Value(s) of monitored parameter	As per the applied maintenance practice for the project activity, general inspection services on the flares are performed every week. Weekly performed general maintenance service includes at least visual checking of the conditions of the flares' ceramic revetment material. While the ceramic revetment material for all flares are currently under good conditions, no material replacement or major overhauling was yet performed. Maintenance service in the flares (including inspection events) are weekly performed by trained and skilled technical service team under conformance with maintenance requirements for the flares (as established by equipment manufacturer) and as required by the ex-ante determined parameter $SPEC_{flare}$. Further details about the parameter $SPEC_{flare}$ are included in Section D.1.
Monitoring equipment	Not applicable.
Measuring/reading/recording frequency	$Maintenance_y$ is monitored annually as per the monitoring plan of the PDD.
Calculation method (if applicable)	Not applicable.

QA/QC procedures	The maintenance event logs and documentation for the whole project activity are recorded as per requirement of the company's ISO 14001 certified quality and control (QA/QC).
Purpose of data/parameter	Calculation of baseline emissions
Additional comments	Monitoring of this parameter is required for the case of enclosed flares and the project participant selects Option B to determine flare efficiency. These dates are required so that they can be compared to the maintenance schedule to check that maintenance events were completed within the minimum time between maintenance events specified by the manufacturer ($SPEC_{flare}$).

The following monitoring parameters (which are also included in the monitoring plan of the PDD) were not monitored during the considered monitoring period and/or were not considered in the context of the determination of achieved emission reductions for the considered monitoring period since the methodological options for which they are applicable were not selected/applied as monitoring or calculation approaches for the determination of baseline emissions achieved by the project activity during the considered monitoring period:

- Volumetric flow of gaseous stream in time interval t on a dry basis ($V_{t,db}$)
- Volumetric fraction of greenhouse gas methane in a hourly time interval *t* on a dry basis ($v_{i,t,db} = v_{i,RG,m}$)
- Saturation pressure of H_2O at temperature Tt in time interval *t* ($P_{H20,t,Sat}$)
- Mass flow of methane in the exhaust gas of the flare on a dry basis at reference conditions in the time period t ($F_{CH4,EG,t}$)

D.3. Implementation of sampling plan

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Not applicable.

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

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Under conformance with provisions and calculation approach of the PDD, Baseline Baseline emissions (BE_y) for the considered monitoring period are determined (in tCO_2e) as follows:

$$BE_y = BE_{CH4,y}$$

Where:

$BE_{CH4,y}$ Baseline emissions of methane from the SWDS[6]. As established by ACM0001 (version 13.0.0), the determination of $BE_{CH4,y}$ is based on the amount of methane that is actually captured and combusted (destroyed) by the project activity and also by taking into account the amount of methane that, in the absence of the project activity (baseline scenario), would be otherwise captured and destroyed in the landfill by the pre-project conventional passive LFG destruction system. In addition,

[6] SWDS = Solid Waste Disposal Site.

the effect of methane oxidation (that, as per ACM0001 (version 13.0.0), is assumed as existing in the baseline and not in the project scenario) is also taken into account. $BE_{CH4,y}$ is thus determined as follows:

$$BE_{CH4,y} = (1 - OX_{top\_layer}) * (F_{CH4,PJ,y} - F_{CH4,BL,y}) * GWP_{CH4}$$

Where:

OX_{top_layer} Fraction of methane in the LFG that would be oxidized in the top layer of the SWDS in the baseline scenario. OX_{top_layer} is ex-ante determined as 10%. Further details about the selection of the value for OX_{top_layer} is included in Section D.1 and in the PDD.

$GWP_{CH4,y}$ Global warming potential of CH_4. GWP_{CH4} is ex-ante determined as 25. Further details about the selection of the value for GWP_{CH4} is included in Section D.1 and in the PDD.

$F_{CH4,BL,y}$ Amount of methane in the LFG that would be flared in the baseline scenario (absence of project activity). As outlined in Section B.6.1 of the PDD, $F_{CH4,BL,y}$ is calculated as per the applicable case 4 of ACM0001 (version 13.0.0) as follows:

$$F_{CH4,BL,y} = F_{CH4,BL,sys,y} = 0.2 * F_{CH4,PJ,y}$$

Where:

$F_{CH4,PJ,y}$ In the particular context of the determination of value of every minute value of $F_{CH4,BL,y}$ for the considered monitoring period and under conformance with ACM0001 (version 13.0.0), the term "*0.2 * $F_{CH4,PJ,y}$*" is calculated as 0.2 times the total amount of captured methane that is sent to all flares for combustion during each the minute *m* within the considered monitoring period ($F_{CH4,PJ,capt,y}$).
Thus, differently than the approach required for the determination of Amount of methane in the LFG flared by the project activity ($F_{CH4,flared,y}$), records for operational status of the flares (parameter Operation of the equipment that consumes the LFG ($O_{pj,h}$)), flame detection in the flares (monitoring parameter $Flame_m$), and/or efficiency of the flares (calculation parameter $\eta_{flare,calc,y}$) are not taken into account in related calculations. This is under conformance with ACM0001 (version 13.0.0). In the particular context of determination of $F_{CH4,BL,y}$, the following thus applies:

$$F_{CH4,BL,y} = 0.2 * F_{CH4,PJ,capt,y}$$

Where:
$F_{CH4,PJ,capt,y} = F_{CH4,sent\_flare,y}$

Details for the determination of every-minute values for $F_{CH4,sent\_flare,y}$ are presented below (under "*Determination of every-minute values for the calculation parameter $F_{CH4,sent\_flare,y}$*").

For the considered monitoring period, the accumulated value for $F_{CH4,BL,y}$ is calculated as 8,123 tCH_4

$F_{CH4,PJ,y}$ Amount of methane in the LFG which is flared and/or used in the project activity.

In the particular case of the project activity, $F_{CH4,PJ,y}$ is determined as follows:

$F_{CH4,PJ,y} = F_{CH4,flared,y}$

Where:

$F_{CH4,flared,y}$ Amount of methane in the LFG flared by the project activity (in tCH_4). In accordance with calculation guidance included in the PDD and by following applicable guidance of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream", every-minute values for $F_{CH4,flared,y}$ are determined as the difference between the amount of methane supplied to the flares and residual methane emissions from combustion of LFG in the flares, as follows:

$F_{CH4,flared,y} = F_{CH4,sent\_flare,y} – (PE_{flare,y} / GWP_{CH4})$

Where:

$F_{CH4,sent\_flare,y}$ Amount of methane in the LFG which is sent to the flares. Details for the determination of every-minute values for $F_{CH4,sent\_flare,y}$ for each individual flare are presented below (under "*Determination of every-minute values for the calculation parameter $F_{CH4,sent\_flare,y}$*").

$PE_{flare,y}$ Project emissions from flaring of the residual gas stream. Details for the determination of every-minute values for $PE_{flare,y}$ for each individual flare are presented below (under "*Determination of $PE_{flare,y}$*").

Determination of every-minute values for the calculation parameter $F_{CH4,sent\_flare,y}$:

For the considered monitoring period, Option C of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (where the gaseous stream the tool shall be applied to is the stream of collected LFG that is sent to the flares)[7] is the selected approach for determination of every minute values for $F_{CH4,sent\_flare,y}$. By following calculation option C (that is one of the applicable calculation methods the PDD refers to), the mass flow of greenhouse gas *i* ($F_{i,t}$) (*i* = CH_4) that is sent to the flares is determined as follows:

$F_{CH4,sent\_flare,y} = F_{CH4,t} = V_{t,wb,n} * v_{CH4,t,wb} * \rho_{CH4,n}$

Where:

[7] It is relevant to note that the PDD states that $F_{CH4,sent\_flare,y}$: will be determined by the following the applicable guidance of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream".

$V_{t,wb,n}$ Volumetric flow of the gaseous stream (LFG) in time interval *t* on a wet basis at reference conditions[8]. For the considered monitoring period, every-minute values of the calculation parameter $V_{t,wb,n}$ (in Nm³ wet gas/h) represents calculated and reported in the monthly emission reduction calculation spreadsheets valid for the considered monitoring period (and enclosed to this Monitoring Report). $V_{t,wb,n}$ thus represents records for the monitoring parameter "Volumetric flow of the gaseous stream in time interval t on a wet basis" ($V_{t,wb}$). Since measurements of LFG flow to the flares are automatically converted and recorded in normalized cubic meters monitoring of pressure and temperature of the LFG is not required for the determination of $V_{t,wb,n}$.

$v_{i,t,wb}$ Volumetric fraction of CH_4 in the gaseous stream in time interval *t* on a wet basis. As per the applied monitoring procedure, every-minute values of the monitoring parameter $v_{i,t,wb}$ (in m³ of CH_4 / m³ of wet LFG) are reported in the monthly emission reduction calculation spreadsheet valid for the considered monitoring period (and enclosed to this Monitoring Report). Further monitoring details about the monitoring parameter $v_{i,t,wb}$ are included in Section D.2.

$\rho_{CH4,n}$ Density of CH_4 in the gaseous stream (LFG) at reference conditions. For the considered monitoring period, value of $\rho_{CH4,n}$ (in kg of CH_4 / m^3 of CH_4) is calculated and reported in the monthly emission reduction calculation spreadsheets valid for the considered monitoring period (and enclosed to this Monitoring Report) as follows:

$$\rho_{CH4,n} = (P_{ref} * MM_i) / (R_u * T_{ref})$$

Where:

P_{ref} Absolute pressure at reference conditions. P_t is ex-ante determined as 101,325 Pa. Further details about the ex-ante determined parameter P_{ref} are included in Section D.1 and in the PDD.

T_{ref} Temperature at reference conditions. T_{ref} is ex-ante determined as 273.15 Kelvin. Further details about the ex-ante determined parameter T_{ref} are included in Section D.1 and in the PDD.

MM_i Molecular mass of greenhouse gas *i* (*i* = CH_4). MM_i (*i* = CH_4) is ex-ante determined as 16.04 kg/mol. Further details about the ex-ante determined parameter MM_i (*i* = CH_4) are presented in Section D.1 and in the PDD.

R_u Universal ideal gases constant. R_u is ex-ante determined as 8,314 Pa.m^3 /kmol.K. Further details about the determination of R_u are presented in the PDD.

[8] As previously indicated in Section B.2., during the period since the start of operation of the project activity until 31/07/2015, a unique LFG flow meter was used for measuring the amount of the LFG sent to all the installed high temperature enclosed flares. While as per as per the applied CDM baseline and monitoring methodology ACM0001 (version 13.0.0) and the methodological tool "Project emissions from Flaring", a unique LFG flow meter is to be utilized for measuring the amount of LFG sent to each one of the installed flares, the lack of flow meters during the considered monitoring period represents a temporary deviation from the registered monitoring plan and applied methodology. As also outlined in Section B.2., in order to address such temporary deviation, a conservative approach is applied for calculating project emissions from flaring ($PE_{flare,y}$) during the considered monitoring period.

$\rho_{CH4,n}$ is calculated as 0.7156650 $kgCH_4$ / m^3CH_4 as reported in the monthly emission reduction calculation spreadsheet valid for the considered monitoring period.

While the calculated every-minute values $F_{i,t}$ (as defined by Option C of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream") are equivalent to every-minute values for $F_{CH4,sent\_flare,y}$ (as defined by ACM0001 (version 13.0.0)), the monthly emission reduction calculation spreadsheets valid for the considered monitoring period include the determination of every minute values of $F_{CH4,sent\_flare,y}$ applicable for the set of installed high temperature enclosed flares (for which collected LFG is sent for combustion under controlled conditions).

Determination of $PE_{flare,y}$:

$PE_{flare,y}$ is determined by following applicable stepwise guidance of the methodological tool "Project emissions from flaring" (version 02.0.0). Every minute values for $PE_{flare,y}$ are determined as a function of every-minute records of mass flow of methane sent to the set of operating flares ($F_{CH4,RG,m}$)[9] as well as based on the assumed default values for flare efficiency ($\eta_{flare,m}$) that is applicable for each one of installed flares as follows:

$$PE_{flare,y} = GWP_{CH4} * \sum_{m=1}^{525,600} F_{CH4,RG,m} * (1 - \eta_{flare,m}) * 10^{-3}$$

Where:

$F_{CH4,RG,m}$ Methane mass flow in the residual gas. For each minute *m* of the considered monitoring period, values for $F_{CH4,RG,m}$ valid for the set of installed flares are equal to every-minute reported measurement records of the calculation sub-parameter "Amount of methane in the LFG which is sent to the flares" ($F_{CH4,sent\_flare,y}$).

$\eta_{flare,m}$ Flare efficiency in minute *m*. For the considered monitoring period, the application of the default 80%[10] value is selected for the determination of $\eta_{flare,m}$ for each individual minute *m* by following applicable guidance as per Option A (Default value) of the methodological tool "Project emissions from flaring" (version 02.0.0), from which the following related guidance of the PDD is effectively applied:

> "(…)
> <u>*Option A: Default value:*</u>
> *For each one of the high temperature enclosed flares installed as part of the project activity, the flare efficiency for each minute m ($\eta_{flare,m}$) is 90% when the following two operational conditions/requirements are simultaneously met (in order to demonstrate that the flare is operating as per the recommendations and requirements set by the equipment manufacturer for the minute m in question):*
> *(1) The temperature of the exhaust gases o the flare (monitoring parameter $T_{EG.m}$) and the flow rate of LFG to the flare (monitoring parameter $F_{RG,m}$)*

[9] As per ACM0001 (version 13.0.0), flare efficiency represents the combustion efficiency of LFG in the flare in terms of CH_4 by considering *inter alia* the time that the flare in question is operating. The combustion efficiency for the enclosed flares may be determined by either applying a default efficiency value or by determining the flare efficiency based on monitored data (as per applicable measurements and calculations).

For enclosed flares that are defined as low height flares, which is the case of the project activity, the flare efficiency in the minute m (nflare,m) shall be adjusted, as a conservative approach, by subtracting 0.1 from the efficiency as determined in Option B. Therefore, the default value applied should be 80%.

is within the manufacturer's specification/requirements for the flare (monitoring parameter $SPEC_{flare}$) in minute m;

(2) Flame is detected in the flare in minute m (monitoring parameter $Flame_m$).

(…)"

The monthly emission reduction spreadsheets (that are enclosed to this Monitoring Report) include every-minute records for both the monitoring parameters $T_{EG.m}$ and $F_{RG,m}$ as per the methodological tool "Project emissions from flaring" valid for the considered monitoring period (where $F_{RG,m}$ is equivalent to $V_{t,wb,n}$ in the particular case of the project activity). As per the applied monitoring procedure, compliance with operational and maintenance requirements for the flares, as established by the *ex-ante* determined parameter "Manufacturer's flare specifications for temperature, flow rate and maintenance schedule interval" ($SPEC_{flare}$), is also considered for the selection of the conservative default value for $\eta_{flare,m}$ as also outlined in the monthly emission reduction spreadsheets. Data records for the monitoring parameter "Flame detection of flare in the minute *m*" ($Flame_m$) are also considered when assuming every-minute value for $\eta_{flare,m}$ as equal to 80% or equal to 0% in the context of the calculation of every minute values of $PE_{flare,y}$ for the considered monitoring period. For each installed flare, the time the flare has operated is determined by monitoring the flame combustion status/condition by using an UV flame detector (of which status signal (flame status "*on*" or "*off*") is continuously recorded and reported). Moreover, the monitoring requirements related to operational requirements/conditions for the flares (as provided by the manufacturer's specifications for operating conditions as per the ex-ante determined parameter $SPEC_{flare}$ (min. and max. flow of LFG to the flares + temperature of exhaust gas of the flare + meeting of maintenance requirements)) are also considered in the context of the application of determined values for $\eta_{flare,m}$ along the considered monitoring period. As outlined in the monthly emission reduction spreadsheets, for each minute *m* within the considered monitoring period whenever it is detected that operating flares have combusted LFG by not operating in accordance with the operational criteria as established by the ex-ante estimated parameter $SPEC_{flare}$ (in terms of LFG flow, temperature of exhaust gas or maintenance practice), no destruction of methane is accounted for the flares as part of the calculation values of $F_{CH4,PJ,y} = F_{CH4,flared,y}$ achieved by the project activity.

As a conservative approach, a criteria to discount all emission reductions generated during the periods when one or more flares operate outside the specified operational ranges is applied, thus assuring that no emission reductions are claimed with the flares operating in non-conformity with the specified operational ranges for the flares. Therefore, if one of the flares is not operating in accordance with the manufacturer specifications for flare temperature, no emission reductions are accounted for the period in question, as a conservative approach[11].

For the considered monitoring period, the accumulated value for $F_{CH4,PJ,y} = F_{CH4,flared,y}$ is calculated as 30,003 tCH_4 .

For the considered monitoring period, baseline emissions of methane from the SWDS ($BE_y = BE_{CH4,y}$) are calculated as 492,300 tCO_2e.

[11] This conservative approach is part of the proposed deviation from the monitoring methodology/monitoring plan of the PDD that was addressed as a post-registration change (PRC) and approved by the CDM-EB on 25/07/2016 (available online: https://cdm.unfccc.int/PRCContainer/DB/prcp795206430/view).

The summarized emission reduction calculation spreadsheets (that are enclosed to this Monitoring Report) summarizes the determination of $BE_y = BE_{CH4,y}$ for the considered monitoring period.

E.2. Calculation of project emissions or actual net removals

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As outlined in the PDD, the operation of the project activity requires consumption of electricity (grid-source electricity or electricity sourced by captive off-grid backup electricity generators). As also established in the PDD, project emissions due to consumption of these electricity carriers are determined by following the applicable guidance of the "Tool to calculated baseline, project and/or leakage emissions from electricity consumption".

Project emissions (PE_y) for the considered monitoring period are determined (in tCO_2e) as follows:

$$PE_y = PE_{EC,1} + PE_{EC,2}$$

Where:

$PE_{EC,1}$ Project emissions due to the consumption of grid-sourced electricity by the project activity

$PE_{EC,2}$ Project emissions due to the consumption electricity by the project activity of electricity sourced by captive off-grid backup electricity generators

Project emissions due to the consumption of grid-sourced electricity by the project activity ($PE_{EC,1}$)

Project emissions due to the consumption of grid-sourced electricity by the project activity ($PE_{EC,1}$) are calculated as per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (version 01) as follows:

$$PE_{EC1,y} = EC_{PJ1,y} * EF_{EL,grid} * (1 + TDL_{j,y})$$

Where:

$TDL_{j,y}$ Average technical transmission and distribution losses for providing electricity to source *j* in year *y.* $TDL_{j,y}$ is determined as 20%. Further details about the ex-post determination of $TDL_{j,y}$ are included in Section D.2.

$EC_{PJ1,y}$ Quantity of electricity consumed from the grid by the project activity during the year *y* As per the applied monitoring procedure, monthly records of grid-sourced electricity consumption valid for the considered monitoring period are summarized below:

Month	Amount of consumed grid-sourced electricity (MWh)
Sep 2013 (from 14/09/2013 to 30/09/2013)	48.891
Oct. 2013	88.489
Nov. 2013	86.376
Dec. 2013	86.985
Jan. 2014	81.160
Feb. 2014	73.977
Mar. 2014	80.643
Apr. 2014	79.142

May. 2014	83.526
Jun. 2014	80.099
Jul. 2014	76.595
Aug. 2014	72.240
Sep. 2014	68.352

Additional monitoring details about the monitoring parameter $EC_{PJ,1}$ are included in Section D.2.

$EF_{EL,grid}$ Emission factor for grid-sourced electricity in year *y*. $EF_{EL,grid}$ is determined as the combined margin emission factor ($EF_{grid,CM,y}$) that is calculated as the weighted average of the operating margin and build margin emission factors. To weight these two factors, the default values applicable to both for the 2nd crediting period are applied. The combined margin emission factor is thus obtained as follows:

$$EF_{grid,CM,y} = w_{OM} * EF_{grid,OM,y} + w_{BM} * EF_{grid,BM,y}$$

Where:

w_{OM} Weighting of operating margin emissions factor. w_{OM} is ex-ante selected as 0.25%. Further details about the ex-ante selected parameter w_{OM} are included the PDD.

w_{BM} Weighting of operating margin emissions factor. w_{BM} is ex-ante selected as 0.75%. Further details about the ex-ante selected parameter w_{BM} are included in the PDD.

$EF_{grid,OM}$ Operating margin CO_2 emission factor in year *y*. As per the applied monitoring procedure, the selected values for the monitoring parameter $EF_{grid,OM,y} = EF_{grid,OM-DD,y}$ (0.5932 tCO_2/MWh and 0.5837 tCO_2/MWh) represent the official average value for years (vintages) 2013 and 2014 respectively as calculated and made public available by the DNA of Brazil. Further details about the monitoring parameter $EF_{grid,OM}$ are included in Section D.2.

$EF_{grid,BM}$ Build margin CO_2 emission factor in year *y*. $EF_{grid,BM}$ is ex-ante determined as 0.2010 tCO_2/MWh. Further details about the ex-ante determined parameter $EF_{grid,BM}$ are included in the PDD.

For the considered monitoring period, project emissions due to the consumption of grid-sourced electricity by the project activity ($PE_{EC1,y}$) are thus calculated as 359 tCO_2 (rounded value).

Project emissions due to the consumption by the project activity of electricity sourced by backup captive off-grid electricity generators ($PE_{EC2,y}$)

Project emissions due to the consumption by the project activity of electricity sourced by backup captive off-grid electricity generators ($PE_{EC2,y}$) are calculated as follows:

$$PE_{EC2,y} = EC_{PJ,2} * EF_{EL,j,y}$$

Where:

$EC_{PJ2,y}$ Quantity of electricity sourced by backup captive off-grid electricity generators consumed by the project activity. As per the applied monitoring procedure, accumulated consumption of electricity sourced by the backup captive off-grid

electricity generators consumption valid for the considered monitoring period is 0.885 MWh. Additional monitoring details about the monitoring parameter $EC_{PJ2,y}$ are included in Section D.2.

$EF_{EL,j,y}$ Emission factor for the diesel generators $EF_{EL,j,y}$ is determined as 1.3 tCO_2/MWh (conservative default value as per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption").

For the considered monitoring period, project emissions due to the consumption of electricity sourced by backup captive off-grid electricity generators ($PE_{EC2,y}$) are calculated as follows:

$PE_{EC,2}$ = 0.885 MWh * 1.3 tCO_2/MWh = 2 tCO_2 (rounded value)

The summarized emission reduction calculation spreadsheet (that is enclosed to this Monitoring Report) includes all calculations related to the determination of $PE_{EC1,y}$ and $PE_{EC2,y}$ for the considered monitoring period.

Total project emissions ($PE_y = PE_{EC,y}$) for the considered monitoring period are calculated as 361 tCO_2 (rounded value)-

E.3. Calculation of leakage emissions

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Not applicable.

E.4. Calculation of emission reductions or net anthropogenic removals

Emission reductions achieved by the project activity during the considered monitoring period are determined as the difference between the accumulated calculated values for baseline emissions (BE_y) and project emissions (PE_y) valid for such period. Calculations of baseline emissions (BE_y) are presented in Section E.1. Calculations of project emissions (PE_y) are presented in Section E.2. As summarized in the table below, during the monitoring period from 14/09/2013 to 30/09/2014 achieved emission reductions are calculated and reported as 491,939 tCO_2e (rounded value):

	Baseline GHG emissions or baseline net GHG removals (t CO_2e)	Project GHG emissions or actual net GHG removals (t CO_2e)	Leakage GHG emissions (t CO_2e)	GHG emission reductions or net anthropogenic GHG removals (t CO_2e)			
				Before 01/01/ 2013	From 01/01/ 2013 until 31/12/ 2020	From 01/01/ 2021	Total amount
Total	492,300	361	-	-	491,939	-	491,939

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO_2e)	Amount estimated ex ante for this monitoring period in the PDD (t CO_2e)
491,939	523,726

E.5.1. Explanation of calculation of "amount estimated ex ante for this monitoring period in the PDD"

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The 523,726 tCO_2e value is calculated as the sum of the estimated emission reductions for the share of year 2013 encompassed by the 2nd 7-year crediting period (from 14/09/2013 to 31/12/2013) + the estimated equivalent emission reductions to be achieved during the share of the monitoring period within year 2014 (from 01/01/2014 to 30/09/2014). Such estimates are calculated as 145,501 tCO_2e + 505,686 tCO_2e * 273/365.

E.6. Remarks on increase in achieved emission reductions

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Not applicable. Achieved emission reductions are about 6% lower than equivalent ex-ante estimated emission reductions for the considered monitoring period.

E.7. Remarks on scale of small-scale project activity

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Not applicable.

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Document information

Version	*Date*	*Description*
09.0	8 October 2021	Revision to: • Ensure consistency with version 03.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN).
08.0	6 April 2021	Revision to: • Reflect the "Clarification: Regulatory requirements under temporary measures for post-2020 cases" (CDM-EB109-A01-CLAR).
07.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
06.0	7 June 2017	Revision to: • Ensure consistency with version 01.0 of the "CDM project standard for project activities" (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from *F-CDM-MR* to *CDM-MR-FORM*; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.

Version	*Date*	*Description*
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.

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