Monitoring report form
(Version 05.1)

MONITORING REPORT		
Title of the project activity	Industrial Wastewater Methane Recovery Project of Bengbu Tushan Thermoelectricity Co.,Ltd.	
UNFCCC reference number of the project activity	6988	
Version number of the monitoring report	01	
Completion date of the monitoring report	12/09/2016	
Monitoring period number and duration of this monitoring period	Period 2 01/09/2013-31/08/2016, three years monitoring period	
Project participant(s)	COFCO Biochemistry (Anhui) Co.,Ltd. LAKEWOOD CARBON CORP. (Purchaser) UPM Umwelt-Projekt-Management GmbH(Purchaser)	
Host Party	People’s Republic of China	
Sectoral scope(s)	Sectoral Scope 13: Waste handling and disposal	
Selected methodology(ies)	ACM0014(Version 04.1.0): “Mitigation of greenhouse gas emissions from treatment of industrial wastewater”	
Selected standardized baseline(s)	Not applicable	
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	597,899tCO_2e	
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	Not applicable	554,177 tCO_2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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The Industrial Wastewater Methane Recovery Project of Bengbu Tushan Thermoelectricity Co., Ltd. (hereinafter referred to as the “Project”) is to recover the biogas generated in the process of wastewater treatment as well as to create heat currently supplied by a fossil fuel. The Project is developed by the COFCO Biochemistry (Anhui) Co.,Ltd. (hereinafter referred to as the “Project Owner”), which is located at the Bengbu City, Anhui Province.

The purpose of the project is to recover biogas generated from the open lagoons while considering the CDM revenue. The main constructions would be newly-built MIC anaerobic reactors, a biogas cleaning system, a co-firing system and a retrofitting aerobic treatment facility. After the implementation of the project, the biogas generated from MIC anaerobic reactors would firstly be sent to the purification system, then the purified biogas would be transported into the retrofitted coal-fired boilers to generate steam. The sludge from the wastewater treatment would be combusted in the boilers after dewatering and drying. When the boiler is in trouble due to failure or malfunction or under maintenance, biogas collected from the MIC reactor is open flared.

A.2. Location of project activity

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The Project is located in Bengbu City, Anhui Province, the People’s Republic of China, which is at the confluence of Jinpu line and Huaihe. The geographic coordinates are north 32° 56’ 01” and east 117° 17’ 11”, respectively.

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
People’s Republic of China (host)	COFCO Biochemistry (Anhui) Co.,Ltd.	No
United Kingdom of Great Britain and Northern Ireland	UPM Umwelt-Projekt-Management GmbH	No
United Kingdom of Great Britain and Northern Ireland	Lakewood Carbon Corp.	No

A.4. Reference of applied methodology and standardized baseline

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The approved baseline and monitoring methodologies which are applicable to the project activity are as follows:
ACM0014: Mitigation of greenhouse gas emissions from treatment of industrial wastewater (version 04.1.0)
Sectoral Scope 13: Waste handling and disposal

The methodology also refers to the following tools:

- Tool for the demonstration and assessment of additionality (Version 06.0.0)
- Tool to determine project emissions from flaring gases containing methane;
- Tool to calculate the emission factor for an electricity system (Version 02.2.1);
- Tool to calculate baseline, project and/or leakage emissions from electricity consumption (Version 01) ;
- Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion (Version 02).

There is no applicable standardized baseline for this project.

A.5. Crediting period of project activity

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The project is registered on 15/08/2012. The start date of the crediting period is 15/08/2012 and choice of crediting period is 10 years, fixed crediting period.

A.6. Contact information of responsible persons/entities

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Name of responsible entity: Uniufa Energy Technology Co., Ltd
Name of responsible person: Mr. Haiting Shi
Telephone: +86-10-84505948
Email: shihaiting@uniufa.com
The above person/entity is not the project participant.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

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Description of the installed technology, technical processes and equipments
The Project recovers the biogas from anaerobic wastewater treatment of ethanol fuel; the purified biogas co-fired with coal is transported to the boilers to generate steam. So, the technology employed by the Project is composed of wastewater treatment technology, a biogas cleaning system and a co-fired system.
(a) Wastewater treatment system

Pre-treatment: Wastewater of ethanol fuel is cooled through cooler and then is sent into the regulation pond for quality and quantity moderation.

Anaerobic treatment: After pre-treatment the wastewater is sent to the 1st stage MIC anaerobic reactor, where the wastewater is biodegraded completely (the removal rate of the COD can be up to 80%). Effluent from the first stage MIC anaerobic reactors is degassed through the degassing tower and then is sent to the second stage MIC anaerobic reactors for further organic decomposition (where the removal rate of COD is around 60%).

Aerobic treatment: Effluent from the 2nd stage anaerobic reactors goes into the bio-trickling filter tower, where the wastewater on the one hand is further cooled to ensure the environment of the aerobic micro-organism in the two stage aerobic reactors is suitable, and on the other hand to reduce foam generation and sludge bulking. Effluent from the bio-trickling filter tower is put into the bio-double pool for aeration treatment, and then the wastewater is pumped to the existing oxidation ditch which is used as the second stage aerobic treatment facility. The treated waste water finally drains into the efficient sedimentation devices for sedimentation. After that, the precipitation sludge at the bottom of settler is pumped back to the sludge treatment system for further treatment, while the separated fresh water from the fresh water tank meeting primary discharged standards is discharged to the wastewater treatment plant.

MIC reactor (Multi-Internal Circulation), which is the third generation anaerobic reactor based on the second. It is composed of two vertical series-connected chambers. The first is the high load chamber of which the bottom zone includes a water inlet and a back flow zone. The second reactor is low load. There is a biogas collector between the first chamber and the second chamber. The three-phase separators are installed at the upper part of them in addition to a three-phase separation cap on the top of the anaerobic reactor. The two reaction chambers and the three-phase separation cap are connected with a lift pipe and a backflow pipe.

(b) Biogas purification and co-fired system

There is a biogas storage cabinet used to collect the biogas produced by degradation of organic matter from the MIC anaerobic reactors. The collected biogas is transported to the gas desulfurization system for purification, and then the purified biogas is transported to Tushan Thermoelectricity Company's boiler room by the booster fan through the biogas mains and distributed to eight co-fired boilers. In both sides of each boiler are installed 2 biogas burner units. The biogas pipelines to the boilers are explosion-proof and anti-tempering, automatic turn off in case of fire and so on. The surplus sludge in the Project is combusted in the boilers after dehydration and drying.
The desulfurization system consists of an alkali washing tower and a bio-reactor. The alkaline liquid in the bio-reactor can be recycled.

Furthermore, when the boiler is in trouble due to failure or malfunction, biogas collected from the MIC reactor is open flared.

The specifications of the major equipment after the implementation of the Project are shown in table B.1.1.

Table B.1.1 Main technical parameters after the implementation of the Project

Parameters			Value
Wastewater treatment system	1st MIC reactor	Size	Φ15×22.8m
		Number	6 units
		Capacity/unit	4,000m^3
		HRT	35h
	2nd MIC reactor	Size	Φ15×22.8m
		Number	2 units
		Capacity/unit	4,000m^3
		HRT	11.7h
	Bio-double pool	Size	73×30×6.3 m
	Bio-trickling filter tower	Size	Φ15×16m
Biogas utilization system	Biogas burner	Number	16units
		Model number	FRQ-21
		Manufacturer	Xuzhou Funi Control Fired Research Institute Co.,Ltd
	Co-fired steam boiler I	Number	3
		Model number	DG-260/9.81-2
		Manufacturer	Dongfang Boiler Plant
		Boiler efficiency	91%
		Water temperature	215℃
		Rated steam pressure	9.81MPa
		Rated steam temperature	540℃
		Rated output	260t/h
		Date of manufacture	2004.05/2004.06/2004.12
	Co-fired steam boiler II	Number	2
		Model number	CG-130/3.82-M×5
		Manufacturer	Sichuan Boiler Plant
		Boiler efficiency	90.21%
		Water temperature	150℃
		Rated steam pressure	3.82MPa
		Rated steam temperature	450℃
		Rated output	130t/h
		Date of manufacture	2003.03/2003.04
	Co-fired steam boiler III	Number	3
		Model number	SG-130/3.82-M247
		Manufacturer	Shanghai Boiler Plant
		Boiler efficiency	90.63%
		Water temperature	158℃
		Rated steam pressure	3.82MPa
		Rated steam temperature	450℃
		Rated output	130t/h
		Date of manufacture	2000.08/2000.08/2000.08

Flow Diagram after the Implementation of the Project

The figure B.1.1 shows general arrangement after the implementation of the project activity.

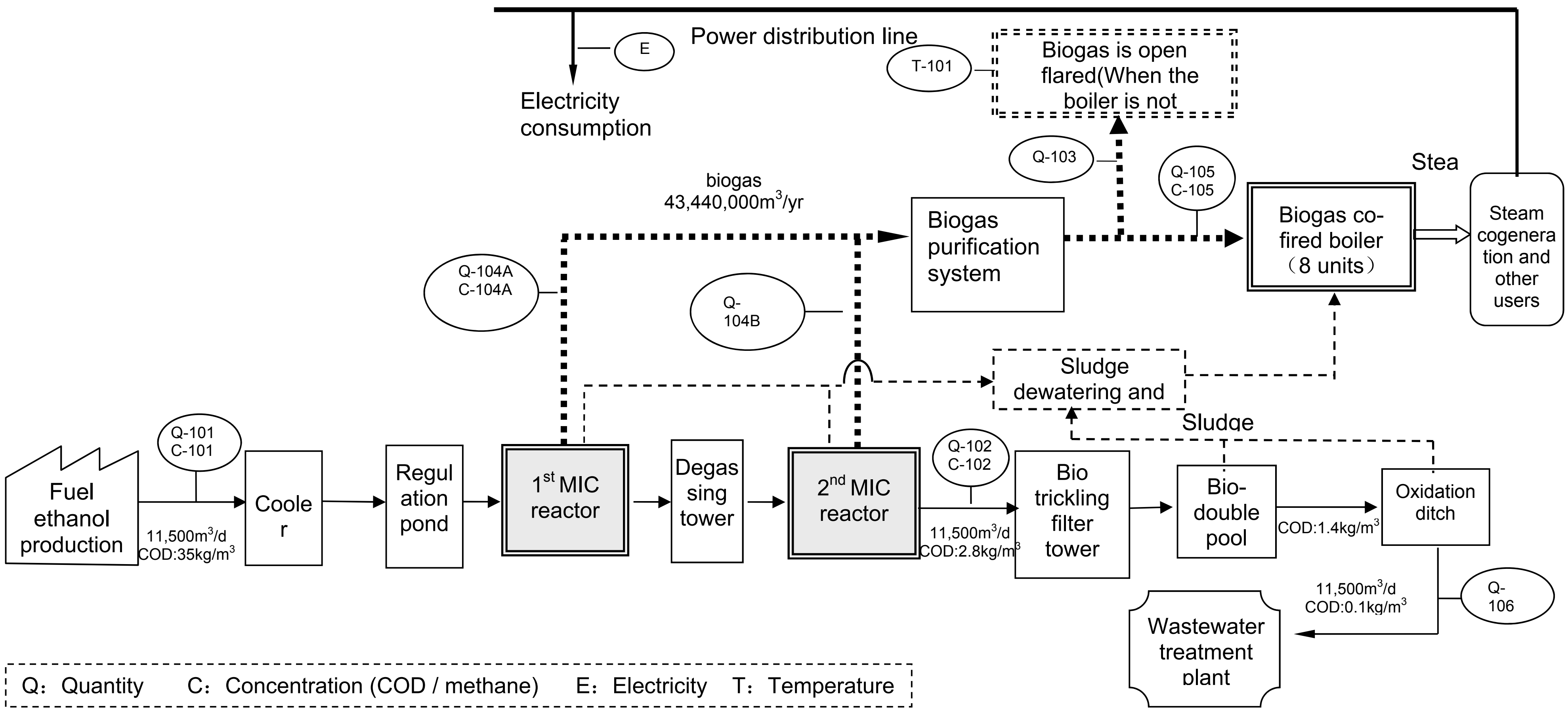

Figure B.1.1. General arrangement drawing after the implementation of the Project

Information on the implementation and actual operation of the project activity

Start date of the project: 18/03/2008
Commissioning date: 09/03/2012
Starting date of continued operation of the Project: 05/06/2012

Actual operation of the project activity during this monitoring period

There were no special events during the monitoring period. No equipment was exchanged or overhauled. The project participant does not submit any request for approval of changes to the registered CDM project.

Events affecting the applicability of the methodology

No events or situations occurred that affected the applicability of the methodology.

B.2. Post-registration changes

B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

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The monitoring plan is the same as described in the registered CDM-PDD. None of the monitoring plan is revised.

B.2.2. Corrections

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No correction is applied during this monitoring period.

B.2.3. Changes to start date of crediting period

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As the registration date of the Project is August 15, 2012, the start date of crediting period is applied to be changed to August 15, 2012 from October 15, 2012.

B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

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N/A

B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

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N/A

B.2.6. Changes to project design of registered project activity

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N/A

B.2.7. Types of changes specific to afforestation or reforestation project activity

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N/A

SECTION C. Description of monitoring system

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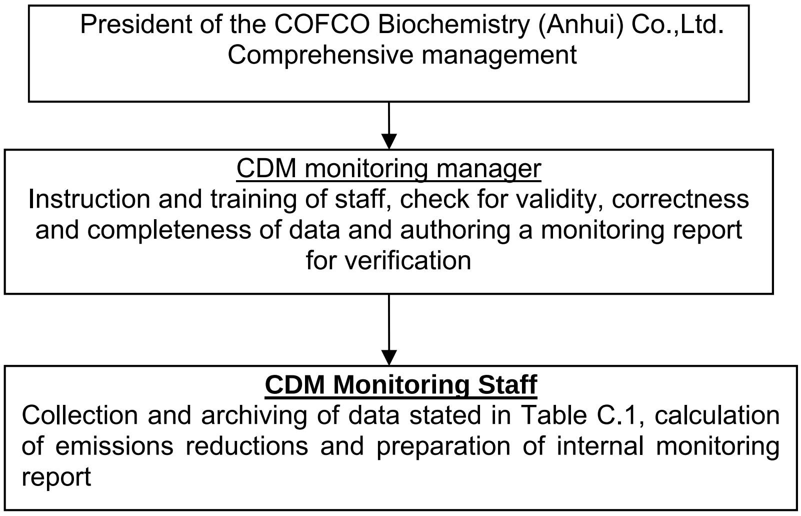
The Monitoring Plan for the Project is developed to ensure complete and reliable data is collected and archived in well-organized manner.

1. Monitoring Organization and Staff Training
An organization dedicated for monitoring of CDM project activity has been set up. The president of the

COFCO Biochemistry (Anhui) Co.,Ltd. appointed one CDM monitoring manager and several CDM monitoring staff. The CDM monitoring group implemented data collection, calibration of meters, recording, archiving of collected data and preparation of monitoring report, etc. The managing structure is shown below.

Figure C.1 Managing structure of the CDM monitoring



The CDM monitoring manager carried out instruction and training of CDM monitoring staff while receiving a necessary support from third party technical experts. The CDM monitoring manager made the CDM monitoring staff understand the importance of monitoring for the CDM project activity as well as instruct technical matters such as how to use, maintain and calibrate monitoring equipment (including on-site training), procedure for error detection, data processing for calculation of emissions reductions, data archiving system (storage media, frequency of recording and backup, etc.), preparation of internal monitoring report and data entry method.

2. Monitoring equipment and installation

Monitoring instrument installation position are shown in Figure B.1.1, monitoring instrument introduction are shown in Table C.1.

Table C.1 Summary of monitoring equipment

No.	Parameter	Location	Remark
Q-101	Wastewater flow	Inlet of anaerobic digester	
C-101	Inflow COD of anaerobic reactor	Inlet of anaerobic digester	Measured periodically
Q-102	Wastewater flow	outlet of anaerobic digester	
C-102	Outflow COD of anaerobic reactor	outlet of anaerobic digester	Measured periodically
C-104A	Methane content	outlet of anaerobic digester, biogas pipe A	Measured periodically
C-104B	Methane content	outlet of anaerobic digester, biogas pipe B	Measured periodically
C-105	Methane content	Biogas boiler entrance pipe / Torch entrance pipe	Measured periodically
Q-104A	Biogas flow meter	Outlet of anaerobic reactor A	
Q-104B	Biogas flow meter	Outlet of anaerobic reactor B	

Q-105	Biogas flow meter	Inlet of co-fired boiler	
Q-103	Biogas flow meter	Inlet of flaring system	
Q-106	Wastewater flow	Outlet of aerobic reactor	
C-106	Outflow COD of aerobic reactor	Outlet of aerobic reactor	
E	Total energy meter	Power distribution cabinet	
T-101	Temperature of the flare	The open flare	

3. Data Collection and Archiving
Data collection and archiving is carried out in conformity with the method stated in section B.7.2.1 of the registered PDD and the monitoring manual was prepared by the starting date of CDM monitoring implementation. Dedicated data entry sheets as well as calculation spreadsheets are prepared. When the data is not temporarily available because of breakdown and/or failure of equipment, conservatively estimated value was used alternatively in transparent and reasonable manner. At the same time, the CDM monitoring manager took actions for prompt recovery from abnormal conditions and minimization of negative impact on production according to the procedures stipulated in the CDM manual. For example, when biogas could not be combusted in the co-fired boiler due to boiler malfunction, the CDM monitoring chief soon directed a CDM monitoring staff to take measures for recovery as well as to record the time when the boiler stops and restarts, and at the same time, informed it to relevant department to adjust plant operation.

4. Data Management
Data monitored for CDM purposes was aggregated, summarized, calculated and recorded as an electronic file at the end of every month. Backup was saved in a digital recording media like CD and as print out. All relevant documents such as maps, drawings, applicable standards, monitoring guidance, etc. are systematically stored in order to use to check appropriateness of data and data management. The collected data and relevant documents were made available to the verifier so that the reliability of the information can be checked. All the data shall be kept until two (2) years after the end of credit period.

5. Quality Assurance and Quality Control
All monitoring equipment was maintained and calibrated in line with manufacturers' instruction or national standards. Calibration was implemented once a year. These activities assure that the equipment operates at the stated level of accuracy.
Data collected by CDM monitoring staff was cross-checked by the CDM monitoring chief and the CDM monitoring manager to detect and correct errors in accordance with the predetermined procedure. In order to check if daily monitoring activities are implemented in compliance with the CDM monitoring manual, and to continuously improve monitoring practice, internal audit was also implemented on once a year. In the internal audit, document survey concerning procedures of data collection, management and archiving, status of calibration, education and training, etc. and onsite audit are made. Corrective action was taken on any deviations from the manual identified though the internal audit.
6. Monitoring Report
COFCO Biochemistry (Anhui) Co.,Ltd. prepared a monitoring report for verification by DOE. The monitoring report included monitoring data biogas flow rate, fraction of methane in biogas, record of calibration of meters, calculations of emission reductions, etc.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data/parameter:	$COD_{out,x}$
Unit	tCOD/y or m
Description	COD of the effluent in the period x (a year of m)
Source of data	FSR
Value(s) applied)	4,830tCOD/y

Choice of data or measurement methods and procedures	/
Purpose of data	Baseline emission calculation
Additional comments	In the FSR, the quantity of the open lagoons effluent COD is less than 1400mg/l, the COD value is conservative.

Data/parameter:	$COD_{in,x}$
Unit	tCOD/y or m
Description	COD directed to the open lagoons in the period x (a year)
Source of data	FSR
Value(s) applied)	120,750 tCOD/y
Choice of data or measurement methods and procedures	/
Purpose of data	Baseline emission calculation
Additional comments	In FSR, the value is monitored actually and conservative

Data/parameter:	Bo
Unit	$tCH_4/tCOD$
Description	Maximum methane producing capacity, expressing the maximum amount of CH_4 that can be produced from a given quantity of chemical oxygen demand (COD)
Source of data	2006 IPCC Guidelines
Value(s) applied)	0.21
Choice of data or measurement methods and procedures	/
Purpose of data	Baseline emission and project emission calculation
Additional comments	/

Data/parameter:	f_d
Unit	/
Description	Factor expressing the influence of the depth of the lagoon or sludge pit on methane generation
Source of data	ACM0014
Value(s) applied)	For the baseline: 50%
Choice of data or measurement methods and procedures	/
Purpose of data	Baseline emission and project emission calculation
Additional comments	/

Data/parameter:	D
Unit	m
Description	Average depth of the lagoon
Source of data	Specification of the baseline anaerobic lagoon
Value(s) applied)	5
Choice of data or measurement methods and procedures	/

Purpose of data	Baseline emission and project emission calculation for determining the f_d
Additional comments	/

Data/parameter:	$EF_{CO2,FF,boiler}$
Unit	tCO_2/GJ
Description	CO_2 emission factor of the fossil fuel type used in the boiler for heat generation in the absence of the project activity
Source of data	IPCC 2006 default value for other bituminous coal
Value(s) applied)	0.0946
Choice of data or measurement methods and procedures	/
Purpose of data	Baseline emission calculation
Additional comments	/

Data/parameter:	$\eta_{BL,boiler}$
Unit	%
Description	Efficiency of the boiler that would be used for heat generation in the absence of the project activity
Source of data	FSR
Value(s) applied)	91
Choice of data or measurement methods and procedures	/
Purpose of data	Baseline emission calculation
Additional comments	/

Data/parameter:	$FL_{biogas,digest}$
Unit	m^3 biogas leaked/ m^3 biogas produced
Description	Fraction of biogas that leak from the digester
Source of data	IPCC(2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5, Chapter 4, Page 4.4)
Value(s) applied)	0.05
Choice of data or measurement methods and procedures	/
Purpose of data	Project emission calculation
Additional comments	Applicable to the new anaerobic digester

Data/parameter:	GWP_{CH4}
Unit	tCO_2/tCH_4
Description	Global warming potential for CH_4
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value(s) applied)	25
Choice of data or measurement methods and procedures	25 after 1/1/2013

Purpose of data	Baseline emission and project emission calculation
Additional comments	According to paragraph 3 of annex 3 EB 69, emission reductions achieved from 1 January 2013 shall be calculated using GWPs as applied by decision 4/CMP.7; The decision 4/CMP.7 indicates that from 1 January 2013, GWPs should use data in table 2.14 of the errata to the contribution of working Group I to the Fourth Assessment Report of the Intergovernmental Pannel on Climate Change where the GWP_{CH4} is 25.

Data/parameter:	A
Unit	Ha
Description	Surface of the lagoon
Source of data	Specification of the baseline anaerobic lagoon
Value(s) applied)	12.5
Choice of data or measurement methods and procedures	/
Purpose of data	To determine the f_d
Additional comments	/

Data/parameter:	$\rho_{CH4,n}$
Unit	kg/m^3
Description	Density of methane gas at normal conditions
Source of data	Tool to calculate the project emissions of the methane combustion
Value(s) applied)	0.716
Choice of data or measurement methods and procedures	/
Purpose of data	Project emission calculation
Additional comments	/

D.2. Data and parameters monitored

Data/parameter:	$F_{PJ,dig,m}$
Unit	m^3/month
Description	Quantity of wastewater that is treated in the anaerobic digester in the project activity in month m
Measured/calculated/default	Measured
Source of data	Measured by electromagnetic flow meter
Value(s) of monitored parameter	286,536 in September 2013; 289,087 in October 2013; 267,655 in November 2013; 278,854 in December 2013; 278,134 in January 2014; 252,096 in February 2014; 280,001 in March 2014; 231,930 in April 2014; 0 in May 2014; 185,801 in June 2014; 280,130 in July 2014; 295,238 in August 2014; 253,016 in September 2014; 277,070 in October 2014; 271,734 in November 2014; 279,192 in December 2014; 278,527 in January 2015; 253,655 in February 2015; 279,544 in March 2015; 220,681 in April 2015; 0 in May 2015; 258,180 in June 2015; 296,094 in July 2015; 300,212 in August 2015; 252,248 in September 2015; 269,885 in October 2015; 270,506 in November 2015; 282,728 in December 2015; 277,606 in January 2016; 262,194 in February 2016; 278,792 in March 2016; 265,649 in April 2016; 0 in May 2016; 131,107 in June 2016; 296,394 in July 2016; 267,010 in August 2016;

Monitoring equipment	electromagnetic flow meter Type: HHD-350K3C1E2F1T1P1D1J2 Serial number:HH12012902 Accuracy class: 0.5 Calibration frequency: annually Date of the last four calibration: 10/05/2013,17/05/2014,16/05/2015 and 15/05/2016 Validity:2 years
Measuring/reading/recording frequency:	Monitored continuously with a flow meter and recorded every day, but aggregated monthly and annually for calculation
Calculation method (if applicable):	/
QA/QC procedures:	The electromagnetic flow meter undergoes calibration in line with national standard JJG1033-2007.
Purpose of data:	Baseline emissions
Additional comments:	/

Data/parameter:	$w_{COD,dig,m}$
Unit	tCOD/ m^3
Description	Average chemical oxygen demand in the wastewater that is treated in the anaerobic digester in the project activity in month m
Measured/calculated/default	Measured
Source of data	Measured by testing in lab
Value(s) of monitored parameter	33,925 in September 2013; 33,984 in October 2013; 34,025 in November 2013; 33,959 in December 2013; 33,953 in January 2014; 34,022 in February 2014; 33,916 in March 2014; 34,032 in April 2014; 0 in May 2014; 33,900 in June 2014; 34,048 in July 2014; 33,955 in August 2014; 33,990 in September 2014; 33,990 in October 2014; 33,962 in November 2014; 34,020 in December 2014; 33,971 in January 2015; 33,926 in February 2015; 33,888 in March 2015; 34,032 in April 2015; 0 in May 2015; 34,053 in June 2015; 33,968 in July 2015; 33,972 in August 2015; 33,911 in September 2015; 33,948 in October 2015; 33,966 in November 2015; 33,999 in December 2015; 34,102 in January 2016; 34,028 in February 2016; 34,008 in March 2016; 33,985 in April 2016; 0 in May 2016; 33,885 in June 2016; 33,981 in July 2016; 33,952 in August 2016;
Monitoring equipment	Measured in lab
Measuring/reading/recording frequency:	Measured periodically and recorded every day, calculated monthly and annually
Calculation method (if applicable):	The arithmetic mean value in month "m" is used for baseline emission calculation
QA/QC procedures:	Measured periodically according to the national standard of Water quality-Determination of the chemical oxygen demand- Dichromate method (GB11914-89), aggregated monthly and annually for calculation
Purpose of data:	Baseline emission calculation
Additional comments:	

Data/parameter:	$F_{PJ,effl,dig,m}$
Unit	m^3/month
Description	Quantity of effluent from the digester in month m
Measured/calculated/default	Measured
Source of data	Measured by electromagnetic flow meter

Value(s) of monitored parameter	286,665 in September 2013; 289,297 in October 2013; 268,079 in November 2013; 279,269 in December 2013; 278,603 in January 2014; 252,346 in February 2014; 280,363 in March 2014; 232,224 in April 2014; 0 in May 2014; 185,258 in June 2014; 280,324 in July 2014; 295,516 in August 2014; 253,358 in September 2014; 277,200 in October 2014; 272,149 in November 2014; 279,444 in December 2014; 278,912 in January 2015; 253,890 in February 2015; 279,465 in March 2015; 221,067 in April 2015; 0 in May 2015; 258,441 in June 2015; 296,258 in July 2015; 300,089 in August 2015; 252,565 in September 2015; 270,148 in October 2015; 270,980 in November 2015; 282,864 in December 2015; 279,199 in January 2016; 262,489 in February 2016; 278,842 in March 2016; 266,039 in April 2016; 0 in May 2016; 130,527 in June 2016; 296,443 in July 2016; 267,290 in August 2016;
Monitoring equipment	Electromagnetic flow meter Type: HHD-350K3C1E2F1T1P1D1J2 Serial number:HH12012903 Accuracy class: 0.5 Calibration frequency: annually Date of the last four calibration: 10/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Validity:2 years
Measuring/reading/recording frequency:	Monitored continuously with a flow meter and recorded every day, but aggregated monthly and annually for calculation
Calculation method (if applicable):	/
QA/QC procedures:	The meter was calibrated according to national standard of Verification regulation of electromagnetic flowmeters (JJG1033-2007). According to this regulation, the meter was calibrated every two years.
Purpose of data:	Project emissions
Additional comments:	/

Data/parameter:	$w_{COD,\ effl,\ dig,m}$
Unit	$tCOD/\ m^3$
Description	Average chemical oxygen demand in the effluent from the digester in month m
Measured/calculated/default	Measured
Source of data	Measured by testing in lab
Value(s) of monitored parameter	2,880 in September 2013; 2,878 in October 2013; 2,877 in November 2013; 2,881 in December 2013; 2,870 in January 2014; 2,880 in February 2014; 2,880 in March 2014; 2,880 in April 2014; 0 in May 2014; 2,877 in June 2014; 2,879 in July 2014; 2,879 in August 2014; 2,872 in September 2014; 2,877 in October 2014; 2,877 in November 2014; 2,873 in December 2014; 2,877 in January 2015; 2,872 in February 2015; 2,890 in March 2015; 2,876 in April 2015; 0 in May 2015; 2,871 in June 2015; 2,871 in July 2015; 2,877 in August 2015; 2,870 in September 2015; 2,876 in October 2015; 2,882 in November 2015; 2,873 in December 2015; 2,869 in January 2016; 2,877 in February 2016; 2,879 in March 2016; 2,869 in April 2016; 0 in May 2016; 2,861in June 2016; 2,875 in July 2016; 2,878 in August 2016;
Monitoring equipment	Measured in lab
Measuring/reading/recording frequency:	Measured in lab and recorded every day, calculated monthly and annually
Calculation method (if applicable):	The arithmetic mean value in month “m” is used for project emission calculation.
QA/QC procedures:	Maintain and calibrate COD according to the national standard of Water quality-Determination of the chemical oxygen demand-Dichromate method (GB11914-89), aggregated monthly and annually for calculation.
Purpose of data:	Project emission calculation

Additional comments:	/

Data/parameter:	$F_{PJ,effl,lag,m}$
Unit	m^3/month
Description	Quantity of effluent from the open lagoon in which the effluent from the digester is treated in month m
Measured/calculated/default	Measured
Source of data	Measured by electromagnetic flow meter
Value(s) of monitored parameter	282,403 in September 2013; 284,613 in October 2013; 263,578 in November 2013; 274,494 in December 2013; 273,661 in January 2014; 248,212 in February 2014; 275,509 in March 2014; 228,224 in April 2014; 0 in May 2014; 181,685 in June 2014; 275,712 in July 2014; 290,702 in August 2014; 248,907 in September 2014; 272,798 in October 2014; 267,491 in November 2014; 274,924 in December 2014; 274,059 in January 2015; 249,735 in February 2015; 275,322 in March 2015; 217,614 in April 2015; 0 in May 2015; 253,860 in June 2015; 291,541 in July 2015; 295,628 in August 2015; 248,219 in September 2015; 265,767 in October 2015; 266,375 in November 2015; 279,359 in December 2015; 273,262 in January 2016; 258,141 in February 2016; 274,429 in March 2016; 261,892 in April 2016; 0 in May 2016;128,6081in June 2016; 292,003 in July 2016;262,554 in August 2016;
Monitoring equipment	Electromagnetic flow meter Type: HHD-450K3C1E2F1T1P1D1J2 Serial number:HH12012904 Accuracy class: 0.5 Calibration frequency: annually Date of the last four calibration: 10/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Validity:2 years
Measuring/reading/recording frequency:	Measured by flow meter, monitored continuously but aggregated annually for calculations.
Calculation method (if applicable):	/
QA/QC procedures:	The electromagnetic flow meter undergoes calibration in line with national standards JJG1033-2007.
Purpose of data:	For project emission calculation
Additional comments:	/

Data/parameter:	$w_{COD,\ effl,\ lag,m}$
Unit	tCOD/ m^3
Description	Average chemical oxygen demand in the effluent from the open lagoon in which the effluent from the digester is treated in month m
Measured/calculated/default	Measured
Source of data	Measured in lab
Value(s) of monitored parameter	74 in September 2013; 74 in October 2013; 74 in November 2013;75 in December 2013; 76 in January 2014; 76 in February 2014; 74 in March 2014; 75 in April 2014; 0 in May 2014; 67 in June 2014; 65 in July 2014; 65 in August 2014; 65 in September 65 in October 2014; 66 in November 2014; 65 in December 2014; 65 in January 2015; 64 in February 2015; 65 in March 2015; 64 in April 2015; 0 in May 2015; 65 in June 2015;62 in July 2015; 65 in August 2015; 64 in September 2015; 66 in October 2015; 65 in November 2015; 65 in December 2015; 65 in January 2016; 66 in February 2016; 64 in March 2016; 65 in April 2016; 0 in May 2016; 651in June 2016; 65 in July 2016; 65 in August 2016;

Monitoring equipment	Measured in lab
Measuring/reading/recording frequency:	Measure the COD regularly, calculate average monthly and annually values
Calculation method (if applicable):	The arithmetic mean value in month "m" is used for project emission calculation.
QA/QC procedures:	The meter undergoes maintenance and calibration in line with manufacture's recommendation
Purpose of data:	For project emission calculation
Additional comments:	/

Data/parameter:	$T_{2,m}$
Unit	K
Description	Average temperature at the project site in month m
Measured/calculated/default	Measured
Source of data	Weather statistic from Anhui Province Meteorological Administration
Value(s) of monitored parameter	295.56 in September 2013; 290.16 in October 2013; 282.36 in November 2013; 275.86 in December 2013;277.46 in January 2014; 276.56 in February 2014; 284.36 in March 2014; 288.66 in April 2014; 295.06 in May 2014; 298.06 in June 2014; 300.36 in July 2014; 297.76 in August 2014; 294.96 in September 2014; 290.76 in October 2014; 283.56 in November 2014; 275.56 in December 2014; 276.96 in January 2015; 277.96 in February 2015; 278.56 in March 2015; 287.86 in April 2015; 294.06 in May 2015; 297.46 in June 2015; 299.36 in July 2015; 299.46 in August 2015; 295.16 in September 2015; 290.66 in October 2015; 282.36 in November 2015; 277.56 in December 2015;274.76 in January 2016; 278.06 in February 2016; 283.76 in March 2016; 290.16 in April 2016; 292.86 in May 2016; 297.26 in June 2016; 299.36 in July 2016; 299.46 in August 2016;
Monitoring equipment	Official statistic data
Measuring/reading/recording frequency:	Continuously, aggregated in monthly average values
Calculation method (if applicable):	/
QA/QC procedures:	/
Purpose of data:	To calculate baseline emission and project emission
Additional comments:	/

Data/parameter:	$\mathbf{HG_{PJ,y}}$
Unit	GJ
Description	Net quantity of heat generated in year y with biogas from the new anaerobic digester
Measured/calculated/default	Calculated
Source of data	Calculated on the basis of measurements of the volume of biogas captured and used for heat generation ($F_{boiler,biogas,y}$) multiplied by the methane content of the gas ($W_{CH4,biogas,y}$), CV methane (NCV_{CH4}), and the efficiency of the boiler during the project (i.e. with biogas: $\eta_{PJ,boiler}$). The efficiency of the boiler during the project ($\eta_{PJ,boiler}$) is set as 91.0%
Value(s) of monitored parameter	708,628 from 01/09/2013 to 31/08/2014 726,982 from 01/09/2014 to 31/08/2015 701,387 from 01/09/2015 to 31/08/2016

Monitoring equipment	For measuring $F_{boiler,biogas,y}$ the biogas flow meter was used. Type: YHNZ-1-1-500-121-112 Serial number: 120218 Accuracy class: 1.0 Calibration frequency: annually Date of the latest four calibration: 09/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Validity:1 year Temperature transmitter Type: KRD-SBWZ-2480-240 Serial number: 181201002 Accuracy class:0.5 Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Industrial platinum resistance Type: Pt100 Serial number: 181201002 Accuracy class: B Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Pressure transmitter Type: T350 Serial number: T12160014 Accuracy class: 0.2 Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 12/05/2014,14/05/2015 and 11/05/2016 Pressure transmitter Type: T350 Serial number: C12160013 Accuracy class: 0.2 Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 12/05/2014,14/05/2015 and 11/05/2016 For measuring $W_{CH4,biogas,y}$ gas analyzer was used. Type: Gasboard-3200L Serial number: 11302270206111000049 Accuracy class: 2.0 Calibration frequency: annually Date of the latest four calibration: 10/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Validity:1 year
Measuring/reading/recording frequency:	The volume of biogas captured and used for heat generation was measured continuously and the methane content of biogas was measured at 5, 10,15, 20, 25 and the end of every month.
Calculation method (if applicable):	$HG_{PJ,y} = F_{boiler,biogas,y} * W_{CH4,biogas,y} * NCV_{CH4} * \eta_{PJ,boiler}$
QA/QC procedures:	The meter undergoes maintenance and calibration in line with manufacture's recommendation
Purpose of data:	Baseline emission
Additional comments:	/

Data/parameter:	$\mathbf{F_{biogas,y}}$
Unit	m^3
Description	Total amount of biogas collected in the outlet of the new digester
Measured/calculated/default	Measured
Source of data	Biogas flow volume
Value(s) of monitored parameter	36,814,778 from 01/09/2013 to 31/08/2014 37,388,513 from 01/09/2014 to 31/08/2015 35,937,994 from 01/09/2015 to 31/08/2016

Monitoring equipment	Gas flow meter 1 Type: ANB-LS Serial number: ANB12010501 Accuracy class: 1.5 Calibration frequency: annually Date of the latest four calibration: 09/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Industrial platinum resistance Type: Pt100 Serial number: 1201006 Accuracy class: B Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Pressure transmitter Type: ZY-PMC Serial number: ZY20120105001 Accuracy class: 0.2 Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 12/05/2014,14/05/2015 and 11/05/2016 Type: EJA110A Serial number: 91LC25311108 Accuracy class: 0.2 Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 12/05/2014,14/05/2015 and 11/05/2016 Gas flow meter 2 Type: YHNZ-1-1-400-121-112 Serial number: 120217 Accuracy class: 1.0 Calibration frequency: annually Date of the latest four calibration: 09/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Temperature transmitter Type: KRD-SBWZ-2480-240 Serial number: 181201001 Accuracy class: 0.5 Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Industrial platinum resistance Type: Pt100 Serial number: 181201001 Accuracy class: B Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Pressure transmitter Type: T350 Serial number: T12160015 Accuracy class: 0.2 Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 12/05/2014,14/05/2015 and 11/05/2016 Type: EJA110A Serial number: 91MB07617251 Accuracy class: 0.2 Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 12/05/2014,14/05/2015 and 11/05/2016

Measuring/reading/recording frequency:	Monitored continuously and recorded daily, aggregated annually for calculation
Calculation method (if applicable):	Volume of biogas from anaerobic outlet 1 added that from outlet 2
QA/QC procedures:	Maintain and calibrate the meter according to national standard of Verification regulation of differential pressure type flowmeter (JJG640-1994). According to this standard, this meter was calibrated annually.
Purpose of data:	Applied to estimate emissions associated with physical leakage from the digester.
Additional comments:	/

Data/parameter:	$F_{boiler,biogas,y}$
Unit	m^3
Description	Amount of biogas of the pumped into boiler in the monitoring period
Measured/calculated/default	Measured
Source of data	Biogas flow volume
Value(s) of monitored parameter	36,723,304 from 01/09/2013 to 31/08/2014 37,293,893 from 01/09/2014 to 31/08/2015 35,847,196 from 01/09/2015 to 31/08/2016

Monitoring equipment	Type: YHNZ-1-1-500-121-112 Serial number: 120218 Accuracy class: 1.0 Calibration frequency: annually Date of the latest four calibration: 09/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Validity:1 year Temperature transmitter Type: KRD-SBWZ-2480-240 Serial number: 181201002 Accuracy class:0.5 Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Industrial platinum resistance Type: Pt100 Serial number: 181201002 Accuracy class: B Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Pressure transmitter Type: T350 Serial number: T12160014 Accuracy class: 0.2 Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 12/05/2014,14/05/2015 and 11/05/2016 Pressure transmitter Type: T350 Serial number: C12160013 Accuracy class: 0.2 Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 12/05/2014, 14/05/2015 and 11/05/2016
Measuring/reading/recording frequency:	Monitored continuously and recorded daily, aggregated annually for calculation
Calculation method (if applicable):	/
QA/QC procedures:	Maintain and calibrate the meter according to national standard of Verification regulation of differential pressure type flowmeter (JJG640-1994). According to this standard, this meter was calibrated annually.
Purpose of data:	Applied to estimate emissions associated with physical leakage from the digester.
Additional comments:	/

Data/parameter:	**$FV_{RG,h}$**
Unit	m^3/h
Description	Volumetric flow rate of the biogas in the hour h
Measured/calculated/default	Measured
Source of data	Monitoring data by gas flow meter
Value(s) of monitored parameter	0

Monitoring equipment	Gas flow meter Type: AVS-100/EX-30CG11DJ Serial number: 12022123 Accuracy class: 1.0 Calibration frequency: annually Date of the latest four calibration: 09/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Validity:1 year
Measuring/reading/recording frequency:	Continuously, aggregated in monthly average values
Calculation method (if applicable):	/
QA/QC procedures:	/
Purpose of data:	To calculate project emission
Additional comments:	/

Data/parameter:	**$W_{CH4,biogas,y}$/$W_{CH4,y}$**
Unit	$kgCH_4/m^3$/%
Description	Concentration of methane in the biogas
Measured/calculated/default	Measured
Source of data	Monitoring data by gas analyzer
Value(s) of monitored parameter	0.4341/60.6 for outlet 1 from 01/09/2013 to 31/08/2014; 0.4341/60.6 for outlet 2 from 01/09/2013 to 31/08/2014; 0.4384/61.2 for outlet 1 from 01/09/2014 to 31/08/2015; 0.4384/61.2 for outlet 2 from 01/09/2014 to 31/08/2015; 0.4380/61.2 for outlet 1 from 01/09/2015 to 31/08/2016; 0.4376/61.1 for outlet 2 from 01/09/2015 to 31/08/2016;
Monitoring equipment	Gas analyser was used. Type: Gasboard-3200L Serial number: 11302270206111000049 Accuracy class: 2.0 Calibration frequency: annually Date of the latest four calibration: 10/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Validity:1 year
Measuring/reading/recording frequency:	Measured at 5, 10, 15, 20, 25 and the end of every month, aggregated in monthly average values
Calculation method (if applicable):	/
QA/QC procedures:	/
Purpose of data:	To calculate project emission and baseline emission
Additional comments:	The methane content was measured at boiler, at outlet 1 of the anaerobic reactors and outlet 2 of the anaerobic reactors.

Data/parameter:	**$EC_{PJ,l,y}$**
Unit	MWh
Description	Quantity of electricity consumed by the project activity
Measured/calculated/default	Measured
Source of data	Monitoring data by electricity meter
Value(s) of monitored parameter	6,843 from 01/09/2013 to 31/08/2014 10,239 from 01/09/2013 to 31/08/2014 9,849 from 01/09/2013 to 31/08/2014

Monitoring equipment	Electricity meter was used. Type: DSSD566 Serial number: 0507970211 Accuracy class: 0.5 Calibration frequency: annually Date of the last four calibration: 11/6/2012, 16/05/2014, 19/05/2015 and 18/05/2016 Validity:4 years
Measuring/reading/recording frequency:	Continuously, aggregated in monthly average values
Calculation method (if applicable):	/
QA/QC procedures:	/
Purpose of data:	To calculate project emission
Additional comments:	/

Data/parameter:	$T_{flare,y}$
Unit	℃
Description	Temperature of the flare
Measured/calculated/default	Measured
Source of data	Monitoring data by thermocouple
Value(s) of monitored parameter	There is no biogas flared in this monitoring period.
Monitoring equipment	Thermocouple Type: K Serial number: 181201003 Accuracy class: II Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Temperature transmitter Type: KRD-SBWR-2400-200 Serial number: 181201003 Accuracy class:0.5 Calibration frequency: annually Date of the latest four calibration: 13/05/2013, 17/05/2014,16/05/2015 and 15/05/2016 Validity:1 year
Measuring/reading/recording frequency:	Continuously, aggregated in monthly average values
Calculation method (if applicable):	/
QA/QC procedures:	/
Purpose of data:	To calculate project emission
Additional comments:	/

Data/parameter:	$\mathbf{TDL_{j,y}}$
Unit	%
Description	Average technical transmission and distribution losses for providing electricity to source j
Measured/calculated/default	Default
Source of data	Tool to calculate baseline project and/or leakage emissions from electricity consumption

Value(s) of monitored parameter	0
Monitoring equipment	/
Measuring/reading/recording frequency:	/
Calculation method (if applicable):	/
QA/QC procedures:	/
Purpose of data:	To calculate project emission
Additional comments:	/

D.3. Implementation of sampling plan

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In this monitoring period, the parameters $\omega_{CH4,biogas,y}$ and $\omega_{CH4,y}$ are monitored fixed on date 5,10,15,20,25,and the end of each month. The parameters of COD are monitored three times a day. In order to calculate the result, the calculation method of Standard for sampling and surveys for CDM project activities and programme of activities (version04.0) is adopted. The calculation process is:

(a) Description of implemented sampling design;

The objective of this sampling effort is to obtain unbiased and reliable estimates of the mean value of the wastewater COD and biogas methane content during the crediting period. The sampling confidence/ precision level, target population, sampling method, sampling size, and sampling frame of each parameter are listed in the following tables.

Data/Parameter	$w_{COD,dig,m}$
Description	Average chemical oxygen demand in the wastewater that is treated in the anaerobic digester in the project activity in month m
Confidence/Precision level	95/10 There is no requirement in ACM0014 (version 04.1.0) for this parameter. According to “Standard for sampling and surveys for CDM project activities and programme of activities” (version 04.0, EB74, Annex 6) paragraph 10, “where there is no specific guidance in the applicable methodology, project proponents shall use 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large scale project activities.”
Target population	Chemical oxygen demand of wastewater inflow before anaerobic reactor in year y, countless instant values
Sampling method	Systematic sampling
Sampling size	964 from 01/09/2013 to 31/08/2014, 984 from 01/9/2014 to 31/08/2015 and 958 from 01/9/2015 to 31/08/2016
Sampling frame	Chemical oxygen demand of wastewater inflow before anaerobic reactor in year y
Sampling frequency	3 times a day
Additional comment	/

Data/Parameter	$w_{COD, effl, dig,m}$
Description	Average chemical oxygen demand in the effluent from the digester in month m
Confidence/Precision level	95/10 There is no requirement in ACM0014 (version 04.1.0) for this parameter. According to “Standard for sampling and surveys for CDM project activities and programme of activities” (version 04.0, EB74, Annex 6) paragraph 10, “where there is no specific guidance in the applicable methodology, project proponents shall use 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large scale project activities.”
Target population	Chemical oxygen demand of wastewater inflow before anaerobic reactor in year y, countless instant values
Sampling method	Systematic sampling
Sampling size	964 from 01/09/2013 to 31/08/2014, 984 from 01/9/2014 to 31/08/2015 and 958 from 01/9/2015 to 31/08/2016
Sampling frame	Chemical oxygen demand of wastewater inflow before anaerobic reactor in year y
Sampling frequency	3 times a day
Additional comment	/

Data/Parameter	$w_{COD, effl, lag,m}$
Description	Average chemical oxygen demand in the effluent from the open lagoon in which the effluent from the digester is treated in month m
Confidence/Precision level	95/10 There is no requirement in ACM0014 (version 04.1.0) for this parameter. According to “Standard for sampling and surveys for CDM project activities and programme of activities” (version 04.0, EB74, Annex 6) paragraph 10, “where there is no specific guidance in the applicable methodology, project proponents shall use 90/10 confidence/precision as the criteria for reliability of sampling efforts for small-scale project activities and 95/10 for large scale project activities.”
Target population	Chemical oxygen demand of wastewater inflow before anaerobic reactor in year y, countless instant values
Sampling method	Systematic sampling
Sampling size	964 from 01/09/2013 to 31/08/2014, 984 from 01/09/2014 to 31/08/2015 and 958 from 01/09/2015 to 31/08/2016
Sampling frame	Chemical oxygen demand of wastewater inflow before anaerobic reactor in year y
Sampling frequency	3 times a day
Additional comment	/

Data/Parameter	$w_{CH4,biogas,y}$
Description	Concentration of methane at the outlet of the boiler
Confidence/Precision level	95/10 According to the registered PDD, the level of accuracy should be deducted from the average concentration of measurement.
Target population	Concentration of methane at the outlet of the boiler, countless instant values
Sampling method	Systematic sampling
Sampling size	64 from 01/09/2013 to 31/08/2014, 65 from 01/09/2014 to 31/08/2015 and 63from 01/09/2015 to 31/08/2016
Sampling frame	Concentration of methane at the outlet of the boiler
Sampling frequency	At 5, 10, 15, 20, 25 and the end of every month
Additional comment	/

Data/Parameter	$w_{CH4, y, 1}$
Description	Concentration of methane at the outlet 1 of the digester
Confidence/Precision level	95/10 According to the registered PDD, the level of accuracy should be deducted from the average concentration of measurement.
Target population	Concentration of methane at the outlet 1 of the digester, countless instant values
Sampling method	Systematic sampling
Sampling size	64 from 01/09/2013 to 31/08/2014, 65 from 01/09/2014 to 31/08/2015 and 63from 01/09/2015 to 31/08/2016
Sampling frame	Concentration of methane at the outlet 1 of the digester
Sampling frequency	At 5, 10, 15, 20, 25 and the end of every month
Additional comment	/

Data/Parameter	$w_{CH4, y, 2}$
Description	Concentration of methane at the outlet 2 of the digester
Confidence/Precision level	95/10 According to the registered PDD, the level of accuracy should be deducted from the average concentration of measurement.
Target population	Concentration of methane at the outlet 2 of the digester, countless instant values
Sampling method	Systematic sampling
Sampling size	64 from 01/09/2013 to 31/08/2014, 65 from 01/09/2014 to 31/08/2015 and 63from 01/09/2015 to 31/08/2016
Sampling frame	Concentration of methane at the outlet 2 of the digester
Sampling frequency	At 5, 10, 15, 20, 25 and the end of every month
Additional comment	/

(b) Collected data (electronic spreadsheets may be attached and referenced);
The sampling frequency for COD measurement is 3 times a day and the sampling frequency for biogas methane content measurement is five times for a month (On the 5^{th} 10^{th} 15^{th} 20^{th} 25^{th} and the last day of month).
The electronic spreadsheets about details of collected data are attached.

(c) Analysis of the collected data;
According to "Standard for sampling and surveys for CDM project activities and programme of activities"(version 04.0) paragraph 17, "when sampling is undertaken, unless differently specified in the methodology applied, the sample mean (or proportion) value shall be used for the emissions reduction calculation, not the lower or upper bound of the confidence interval". Thus, the sample mean (or proportion) of COD is used in ER calculation. The lower/ upper bond value of concentration of methane is used as it is described in the registered PDD that the level of accuracy should be deducted from the average concentration of measurement.

(d) Demonstration on whether the required confidence/precision has been met.

According to paragraph 11 to 17 in appendix 4 of annex 8 of EB75, the demonstration process is as follows:

(i) Standard error of the mean
The equation for the standard error of the mean when data have been collected using simple random sampling is $\sqrt{(1-f)\frac{s^2}{n}}$
Where,
f is the sampling fraction – the proportion of the population that is sampled. In the following calculation,

f is assumed as 0, because the population is huge and numbers of sampled can be ignored.
s^2 is the sample variance (s is the sample standard deviation).
n is the sample size.

(ii) t-value
This value depends on (i) the level of confidence and (ii) the size of the sample. The exact figure can be acquired from statistical tables for the t-distribution, or using standard statistical software. The value can also be derived in Microsoft Excel using the TINV function.

(iii) Precision
The precision associated with an estimate is: t-value×standard error of the mean.
The relative precision equals to precision divides the average value.

The calculation result is as follows,

Parameter	Average value	Standard deviation	Sample size	tn-1	Lower /upper bound	Precision (calculated)	Precision requirement
$\omega_{CH4,\ biogas,\ y}$ 09/2013-08/2014	59.9	3.2806	64	1.9983	59.1%(lower bound)	1.37%	10%
$\omega_{CH4,\ biogas,\ y}$ 09/2014-08/2015	60.5	3.2472	65	1.9977	59.7%(lower bound)	1.33%	10%
$\omega_{CH4,\ biogas,\ y}$ 90/2015-08/2016	60.6	2.7116	63	1.9990	599%(lower bound)	1.13%	10%
$w_{CH4,y,1}$ 09/2013-08/2014	59.8	3.2931	64	1.9983	60.6% (upper bound)	1.38%	10%
$w_{CH4,y,1}$ 09/2014-08/2015	60.4	3.2110	65	1.9977	61.2% (upper bound)	1.32%	10%
$w_{CH4,y,1}$ 092015-08/2016	60.5	2.7045	63	1.9990	61.2% (upper bound)	1.13%	10%
$w_{CH4,y,2}$ 09/2013-08/2014	59.8	3.3067	64	1.9983	60.6% (upper bound)	1.38%	10%
$w_{CH4,y,2}$ 09/2014-08/2015	60.4	3.2291	65	1.9977	61.2% (upper bound)	1.32%	10%
$w_{CH4,y,2}$ 09/2015-08/2016	60.4	2.7228	63	1.9990	61.1% (upper bound)	1.13%	10%
$w_{COD,dig,m}$ 90/2013-08/2014	33,975	553.0432	964	1.9624	/	0.10%	10%
$w_{COD,dig,m}$ 09/2014-08/2015	33,978	579.8087	984	1.9624	/	0.11%	10%
$w_{COD,dig,m}$ 09/2015-08/2016	33,985	568.0666	958	1.9624		0.11%	10%
$w_{COD,\ effl,\ dig,m}$ 09/2013-08/2014	2,878	41.8831	964	1.9624	/	0.09%	10%
$w_{COD,\ effl,\ dig,m}$ 09/2014-08/2015	2,876	42.9377	984	1.9624	/	0.09%	10%
$w_{COD,\ effl,\ dig,m}$ 09/2015-08/2016	2,874	43.1738	958	1.9624	/	0.10%	10%
$w_{COD,\ effl,\ lag,m}$	72	8.9196	964	1.9624	/	0.78%	10%

09/2013-08/2014							
$w_{COD, effl, lag,m}$ 09/2014-08/2015	65	5.8025	984	1.9624	/	0.56%	10%
$w_{COD, effl, lag,m}$ 09/2015-08/2016	65	5.7030	958	1.9624		0.56%	10%

As demonstrated above, the confidence/precision has been met in accordance with the sampling plan. Further details can be seen from relevant electronic sheets.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

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$$BE_y = BE_{CH4,y} + BE_{EL,y} + BE_{HG,y}$$

Where:

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
BE_y	Baseline emissions in the monitoring period (tCO_2e).	242,633	238,672	235,065
$BE_{CH4,y}$	Methane emissions from anaerobic treatment of the wastewater in open lagoons in the absence of the project activity in the monitoring period (tCO_2e).	168,967	163,098	162,152
$BE_{EL,y}$	CO_2 emissions associated with electricity generation that is displaced by the project activity and/ or electricity consumption in the absence of the project activity in the monitoring period (tCO_2);	0	0	0
$BE_{HG,y}$	CO_2 emissions associated with fossil fuel combustion for heating equipment that is displaced by the project in the monitoring period (tCO_2).	73,666	75,574	72,913

$$BE_{CH4,y} = GWP_{CH4} \times MCF_{BL,y} \times B_o \times COD_{BL,y}$$

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
$BE_{CH4,y}$	Methane emissions from anaerobic treatment of the wastewater in open lagoons in the absence of the project activity in the monitoring period（tCO_2e）	168,967	163,098	162,152
GWP_{CH4}	Global Warming Potential of methane valid for the commitment period（tCO_2e/tCH_4）.	25	25	25
$MCF_{BL,y}$	Average baseline methane conversion factor (fraction) in the monitoring period, representing the fraction of ($COD_{PJ,y}$ x B_o) that would be degraded to CH_4 in the absence of the project activity.	0.3373	0.3209	0.3317

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
B_o	Maximum methane producing capacity, expressing the maximum amount of CH_4 that can be produced from a given quantity of chemical oxygen demand（$tCH_4/tCOD$）.	0.21	0.21	0.21
$COD_{BL,y}$	Quantity of chemical oxygen demand that would be treated in open lagoons in the absence of the project activity in the monitoring period （tCOD）.	95,417	96,810	93,115

$$COD_{BL,y} = AD_{BL} \times COD_{PJ,y}$$

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
COD_{BLy}	Quantity of chemical oxygen demand that would be treated in open lagoons in the absence of the project activity in the monitoring period（tCOD）	95,417	96,810	93,115
$COD_{PJ,y}$	Quantity of chemical oxygen demand that is treated in the anaerobic digester or under clearly aerobic conditions in the project activity in the monitoring period （tCOD）.	99,393	100,843	96,994
AD_{BL}	Effluent adjustment factor expression the percentage of COD that is degraded in open lagoons in the absence of the project activity.	0.96	0.96	0.96

$$AD_{BL} = 1 - \frac{COD_{out,x}}{COD_{in,x}}$$

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
AD_{BL}	Effluent adjustment factor expression the percentage of COD that is degraded in open lagoons in the absence of the project activity	0.96	0.96	0.96
$COD_{out,x}$	Design COD outflow from the baseline anaerobic lagoon in period x (a year)（tCOD/yr）	4,830	4,830	4,830
$COD_{in,x}$	Design COD inflow to the baseline anaerobic lagoon in period x (a year)（tCOD/yr）	120,750	120,750	120,750

$$COD_{PJ,y} = \sum_{m=1}^{12} F_{PJ,dig,m} \times w_{COD,dig,m}$$

Parameter	Description
$COD_{PJ,y}$	Quantity of chemical oxygen demand that is treated in the anaerobic digester or under clearly aerobic conditions in the project activity (t COD)

Parameter	Description
$F_{PJ,dig,m}$	Quantity of wastewater that is treated in the anaerobic digester in the project activity in month m （m³/month）
$w_{COD,dig,m}$	Average chemical oxygen demand in the wastewater that is treated in the anaerobic digester or under clearly aerobic conditions in the project activity in month m. （tCOD/m³）
m	Months of year y of the crediting period

$$MCF_{BL,y} = f_d \times f_{T,y} \times 0.89$$

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
$MCF_{BL,y}$	Average baseline methane conversion factor (fraction) in the monitoring period, representing the fraction of ($COD_{PJ,y}$ x B_o) that would be degraded to CH_4 in the absence of the project activity	0.3373	0.3209	0.3317
f_d	Factor expressing the influence of the depth of the lagoon on methane generation	50%	50%	50%
$f_{T,y}$	Factor expressing the influence of the temperature on the methane generation in the monitoring period	0.7579 The calculation process is available in the ER sheet.	0.7210 The calculation process is available in the ER sheet.	0.7454 The calculation process is available in the ER sheet.
0.89	Conservativeness factor			

Determination of $f_{T,y}$

$COD_{available,m} = COD_{BL,m} + (1 - f_{T,m}) \times COD_{available,m-1}$ with

$$COD_{BL,m} = AD_{BL} \times COD_{PJ,m}$$

$$COD_{PJ,m} = F_{PJ,dig,m} \times w_{COD,dig,m}$$

Where:

$COD_{available,m}$ Quantity of chemical oxygen demand available for degradation in the open lagoon in month m (t COD/month)

$COD_{BL,m}$ Quantity of chemical oxygen demand that would be treated in open lagoons in the absence of the project activity in month m(t COD/month)

$COD_{PJ,m}$ Quantity of chemical oxygen demand that is treated in the anaerobic digester or under clearly aerobic conditions in the project activity in month m (t COD/month)

AD_{BL} Effluent adjustment factor expressing the percentage of COD that is degraded in open lagoons in the absence of the project activity

$F_{PJ,dig,m}$ Quantity of wastewater that is treated in the anaerobic digester or under clearly aerobic conditions in the project activity in month m (m³/month)

$w_{COD,dig,m}$ Average chemical oxygen demand in the wastewater that is treated in the anaerobic digester or under clearly aerobic conditions in the project activity in month m(t COD/m³)

$f_{T,m}$ Factor expressing the influence of the temperature on the methane generation in month m

m Months of year y of the crediting period

The monthly factor to account for the influence of the temperature on methane generation is calculated based on the following van.t Hoff. Arrhenius. Approach

$f_{T,m}$= 0 if $T_{2,m}$<283K

$f_{T,m} = \exp\left(\frac{E*(T_{2,m}-T_1)}{R*T_1*T_{2,m}}\right)$ if 283K< $T_{2,m}$<303K

$f_{T,m}$ =0 if $T_{2,m}$>303K

Where:

$f_{T,m}$	Factor expressing the influence of the temperature on the methane generation in month m
E	Activation energy constant (15,175 cal/mol)
$T_{2,m}$	Average temperature at the project site in month m (K)
T_1	303.16 K (273.16 K + 30 K)
R	Ideal gas constant (1.987 cal/K mol)
M	Months of year *y* of the crediting period

Based on the monthly values $f_{T,m}$, the annual value $f_{T,y}$ is calculated as follows:

$$f_{T,y} = \frac{\sum_{m=1}^{m} f_{T,m} \times COD_{available,m}}{\sum_{m=1}^{m} COD_{BL,m}}$$

Where:

$f_{T,y}$	Factor expressing the influence of the temperature on the methane generation in year y
$f_{T,m}$	Factor expressing the influence of the temperature on the methane generation in month m
$COD_{available,m}$	Quantity of chemical oxygen demand available for degradation in the open lagoon in month m (t COD/month)
$COD_{BL,m}$	Quantity of chemical oxygen demand that would be treated in open lagoons in the absence of the project activity in month m (t COD/month)
m	Months of year y of the crediting period

$$BE_{HG,y} = \frac{HG_{PJ,y} \times EF_{CO2,FF,boiler}}{\eta_{BL,boiler}}$$

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
$BE_{HG,y}$	CO_2 emissions associated with fossil fuel combustion for heating equipment that is displaced by the project in the monitoring period (tCO_2)	73,666	75,574	72,913
$HG_{PJ,y}$	Net quantity of heat generated in the monitoring period with biogas from the new anaerobic digester (GJ)	708,628	726,982	701,387
$EF_{CO2,FF,boiler}$	CO_2 emission factor of the fossil fuel type used in the boiler for heat generation in the absence of the project activity (tCO_2/ TJ)	0.0946	0.0946	0.0946
$\eta_{BL,boiler}$	Efficiency of the boiler that would be used for heat generation in the absence of the project activity	91%	91%	91%

$$HG_{PJ,y} = F_{biogas,y} \times w_{CH4,biogas,y} \times NCV_{CH4} \times \eta_{PJ,boiler}$$

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
$F_{biogas,y}$	Amount of biogas collected at the inlet of the boiler in year y(m^3)	36,723,304	37,293,893	35,847,196
$w_{CH4,biogas,y}$	Concentration of methane in the biogas at the inlet of the boiler.	59.1%	59.7%	59.9%
NCV_{CH4}	Net calorific value of methane (GJ/m^3)	0.0359	0.0359	0.0359

$\eta_{PJ,boiler}$	Efficiency of the boiler during in the Project (i.e. with biogas).	91%	91%	91%

Based on the formula above, the baseline emissions are calculated to be $BE_y = BE_{CH4,y} + BE_{EL,y} + BE_{HG,y}$ =242,633tCO_2e from 01/09/2013 to 31/08/2014, 238,672 tCO_2e from 01/09/2014 to 31/08/2015 and 235,065tCO_2e from 01/09/2015 to 31/08/2016=716,370 tCO_2e.

E.2. Calculation of project emissions or actual net GHG removals by sinks

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$$PE_y = PE_{\mathbf{CH4},effluent,y} + PE_{CH4,digest,y} + PE_{flare,y} + PE_{EC,y}$$

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
PE_y	Project emissions in the monitoring period (tCO_2e)	51,759	55,972	54,462
$PE_{CH4,effluent,y}$	Project emissions from treatment of wastewater effluent from the anaerobic digester in the monitoring period(tCO_2e)	22,886	22,174	21,984
$PE_{CH4,digest,y}$	Project emissions from physical leakage of methane from the anaerobic digester in the monitoring period (tCO_2e)	19,977	20,487	19,675
$PE_{flare,y}$	Project emissions from flaring of biogas generated in the anaerobic digester in the monitoring period (tCO_2e)	0	0	0
$PE_{EC,y}$	Project emissions from electricity consumption in the monitoring period (tCO_2e)	8,896	13,311	12,803

$$PE_{\mathbf{CH4},effluenty} = GWP_{CH4} \times MCF_{PJ,y} \times B_o \times (COD_{PJ,effl,dig,y} - COD_{PJ,effl,lag,y})$$

$$COD_{PJ,effl,dig,y} = \sum_{m=1}^{12} \mathbf{F}_{PJ,effl,dig,m} \times w_{COD,effl,dig,m}$$

$$COD_{PJ,effl,lag,y} = \sum_{m=1}^{12} \mathbf{F}_{PJ,effl,lag,m} \times w_{COD,effl,lag,m}$$

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
$PE_{CH4,effluent,y}$	Project emissions from treatment of wastewater effluent from the anaerobic digester in the monitoring period (tCO_2e)	22,886	22,174	21,984
GWP_{CH4}	Global Warming Potential of methane valid for the commitment period(tCO_2e / tCH_4)	25	25	25

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
$MCF_{PJ,y}$	Project methane conversion factor (fraction) in year y, representing the fraction of ($COD_{PJ,effluent,y}$ x B_o) that degraded to CH_4	0.5306	0.5048	0.5218
B_o	Maximum methane producing capacity, expressing the maximum amount of CH4 that can be produced from a given quantity of chemical oxygen demand(tCH_4 / tCOD)	0.21	0.21	0.21
$COD_{PJ,effl,dig,y}$	Quantity of chemical oxygen demand in the effluent from the digester in the monitoring period (tCOD)	8,427	8,542	8,210
$COD_{PJ,effl,lag,y}$	Quantity of chemical oxygen demand in the effluent of the open lagoon or dewatering facility in which the effluent from the digester is treated in the monitoring period (tCOD)	212	175	185
$F_{PJ,effl,dig,m}$	Quantity of effluent from the digester in month m(m^3 / month)	Data is available in the ER sheet	Data is available in the ER sheet	Data is available in the ER sheet
$w_{COD,effl,dig,m}$	Average chemical oxygen demand in the effluent from the digester in month m (t COD / m^3)	Data is available in the ER sheet	Data is available in the ER sheet	Data is available in the ER sheet
$F_{PJ,effl,lag,m}$	Quantity of effluent from the open lagoon or dewatering facility in which the effluent from the digester is treated in month m	Data is available in the ER sheet	Data is available in the ER sheet	Data is available in the ER sheet
$w_{COD,effl,lag,m}$	Average chemical oxygen demand in the effluent from the open lagoon or dewatering facility in which the effluent from the digester is treated in month m	Data is available in the ER sheet	Data is available in the ER sheet	Data is available in the ER sheet

$MCF_{PJ,y}$ is calculated as follows:

$$MCF_{PJ,y} = f_d \times f_{PJ,T,y}$$

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
$MCF_{PJ,y}$	Project methane conversion factor (fraction), representing the fraction of ($COD_{PJ,effluent,y}$ x B_o) that degraded to CH_4	0.5306	0.5048	0.5218
f_d	Factor expressing the influence of the depth of the lagoon or dewatering facility on methane generation	70%	70%	70%
$f_{PJ,T,y}$	Factor expression the influence of the temperature on the methane generation under the project activity in year y	0.7580 The calculation process is available in the ER sheet.	0.7211 The calculation process is available in the ER sheet.	0.7455 The calculation process is available in the ER sheet.

Determination of $f_{PJ,T,y}$

$$f_{PJ,T,y} = \frac{\sum_{m=1}^{12} f_{T,m} \times COD_{PJ,available,m}}{\sum_{m=1}^{12} (COD_{PJ,effl,dig,m} - COD_{PJ,effl,lag,m})}$$

$$COD_{PJ,available,m} = (COD_{PJ,effl,dig,m} - COD_{PJ,effl,lag,m}) + (1 - f_{T,m}) \times COD_{PJ,available,m-1}$$

$$COD_{PJ,effl,dig,m} = F_{PJ,effl,dig,m} \times w_{COD,effl,dig,m}$$

$$COD_{PJ,effl,lag,m} = F_{PJ,effl,lag,m} \times w_{COD,effl,lag,m}$$

Where:

$COD_{PJ,available,m}$	Quantity of chemical oxygen demand available for degradation in the open lagoon or dewatering facility under the project activity in month m (t COD/month)
$COD_{PJ,effl,dig,m}$	Quantity of chemical oxygen demand in the effluent from the digester in month m (tCOD/month)
$COD_{PJ,effl,lag,m}$	Quantity of chemical oxygen demand in the effluent of the open lagoon or dewatering facility in which the effluent from the digester is treated in month m (tCOD/month)
$F_{PJ,effl,dig,m}$	Quantity of effluent from the digester in month m (m³/month)
$w_{COD,effl,dig,m}$	Average chemical oxygen demand in the effluent from the digester in month m (t COD/m³)
$F_{PJ,effl,lag,m}$	Quantity of effluent from the open lagoon or dewatering facility in which the effluent from the digester is treated in month m (m³/month)
$w_{COD,effl,lag,m}$	Average chemical oxygen demand in the effluent from the open lagoon or dewatering facility in which the effluent from the digester is treated in month m (t COD/m³)
$f_{T,m}$	Factor expressing the influence of the temperature on the methane generation in month m
m	Months of year y of the crediting period

$f_{T,m}$ is calculated based on the equation provided in calculation of baseline emission above.

$$PE_{CH4,digest,y} = F_{biogas,y} \times FL_{biogas,digest} \times w_{CH4,y} \times GWP_{CH4} \times 0.001$$

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
$PE_{CH4,digest,y}$	Project emissions from physical leakage of methane from the anaerobic digester(tCO_2e)	19,977	20,487	19,675
$F_{biogas,y,1}$	Amount of biogas collected in the outlet of the anaerobic outlet 1 (m^3)	31,192,314	31,676,971	30,447,883
$F_{biogas,y,2}$	Amount of biogas collected in the outlet of the anaerobic outlet 2 (m^3)	5,622,464	5,711,542	5,490,111
$FL_{biogas,digest}$	Fraction of biogas that leaks from the digester (m³ biogas leaked / m³ biogas produced)	0.05 according to ACM0014 V04.1	0.05 according to ACM0014 V04.1	0.05 according to ACM0014 V04.1
$w_{CH4,,y,1}$	Concentration of methane in the biogas in the outlet of the new digester 1 (kg CH_4 / m³).	0.4341	0.4384	0.4380
$w_{CH4,,y,2}$	Concentration of methane in the biogas in the outlet of the new digester 2 (kg CH_4 / m³).	0.4341	0.4384	0.4376
GWP_{CH4}	Global Warming Potential of methane valid for the commitment period (tCO_2e / tCH_4)	25	25	25

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

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
$PE_{flare,y}$	Project emissions from flaring of the residual gas stream in the monitoring period (tCO_2e)	0	0	0
$TM_{RG,h}$	Mass flow rate of methane in the residual gas in the hour h (kg/h)	0	0	0
$\eta_{flare,h}$	Flare efficiency in hour h	--	--	--
GWP_{CH4}	Global warming potential of methane valid for the commitment period (tCO_2e/tCH_4)	21	25	25

$$TM_{RG,h} = FV_{RG,h} \times fv_{CH4,RG,h} \times \rho_{CH4,n}$$

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
$FV_{RG,h}$	Volumetric flow rate of the residual gas in dry basis at normal conditions in hour h (m^3/h)	0	0	
$fv_{CH4,RG,h}$	Volumetric fraction of methane in the residual gas on dry basis in hour h (i refers to methane).	--	--	
$\rho_{CH4,n}$	Density of methane at normal conditions (kg/m^3)	0.716	0.716	

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

Parameter	Description	Data from 01/09/2013 to 31/08/2014	Data from 01/09/2014 to 31/08/2015	Data from 01/09/2015 to 31/08/2016
$PE_{EC,y}$	Project emissions from electricity consumption in the monitoring period (tCO_2)	8,896	13,311	12,803
$EC_{PJ,j,y}$	Quantity of electricity consumed by the project electricity consumption source j in year y (MWh)	6,843	10,239	9,849
$EF_{EL,j,y}$	Emission factor for electricity generation for source j in year y (tCO_2/MWh)	1.3	1.3	1.3
$TDL_{j,y}$	Average technical transmission and distribution losses for providing electricity to source *j* in the monitoring period	0%	0%	0%

Based on the formula above, project emissions are calculated to be

$PE_y = PE_{CH4,effluent,y} + PE_{CH4,digest,y} + PE_{flare,y} + PE_{EC,y}$ =51,759tCO_2e from 01/09/2013 to 31/08/2014, 55,972 tCO_2e from 01/09/2014 to 31/08/2015 and 54,462tCO_2e from 01/09/2015 to 31/08/2016=162,193 tCO_2e.

E.3. Calculation of leakage

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E.4. Summary of calculation of emission reductions or net GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	GHG emission reductions or net GHG removals by sinks (t CO_2e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total	716,370	162,193	0	0	554,177	554,177

E.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD

In this monitoring period from 01/09/2013 to 31/08/2016, with 1,096 days of three years in total, and the actual emission reduction is 554,177tCO2e. The estimation of this monitoring period based on the registered PDD is 199,118×1096/365=597,899tCO2e

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO_2e)	597,899	554,177

E.6. Remarks on difference from estimated value in registered PDD

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There is no essential difference between the actual project and the project design due to the wastewater quality and quantity that fluctuates around the designed value which influences the baseline and project emission.

No increase of actual GHG emissions from the registered PDD.

Appendix 1. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	☑ Project participant ☐ Person/entity responsible for completing the CDM-MR-FORM
Organization name	Lakewood Carbon Corp.
Street/P.O. Box	Box 957
Building	Offshore Incorporations Centre
City	Road Town
State/region	Tortola British Virgin Islands
Postcode	/
Country	United Kingdom of Great Britain and Northern Ireland
Telephone	+86-10-84505001(Beijing Office)
Fax	/
E-mail	lcc@lakewoodcarbon.com
Website	/
Contact person	Mr. Robert W. Anderson, Jr.
Title	/
Salutation	Mr.
Last name	Anderson
Middle name	
First name	Robert
Department	/
Mobile	/
Direct fax	/
Direct tel.	+86-010-84505001
Personal e-mail	lcc@lakewoodcarbon.com

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Document information

Version	Date	Description
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.
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 (EB70, 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	28 May 2010	EB 54, Annex 34. Initial adoption.

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