CDM Monitoring Report

UNFCCC Registration Number: 2130

METHANE RECOVERY IN WASTEWATER TREATMENT PROJECT AIN07-W-04, SUMATERA UTARA, INDONESIA

Monitoring Period: 16 January 2009 – 28 February 2010

Document ID: MR01-AIN07-W-04, V.1
Date: 25 March 2010

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Sections

Section A General Project Information

A.1 Project information

UNFCCC Registration Number:	2130
Project Title:	Methane recovery in wastewater treatment project AIN07-W-04, Sumatera Utara, Indonesia
Crediting Period:	16 January 2009 – 15 January 2016 (renewable)
Methodology/Version:	AMS-III.H / Version 7
UNFCCC Registration Date:	16 January 2009
Report Number/Version/Date:	MR01-AIN07-W-04 / V1.0 / 25 March 2010
Monitoring Reporting Period:	16 January 2009 – 28 February 2010

Parties involved:	• Indonesia (NA1 Host Country) • Netherlands (Annex 1 Party)
Project participants:	• PT AES AgriVerde Indonesia • AES AgriVerde Ltd.

A.2 Project emission reduction history

The following table lists the monitoring reports associated with and emission reductions achieved by this project activity.

Report	Dates		ERs	Verifying DOE
	From	To		
MR01-AIN07-W-04	16 Jan 2009	28 Feb 2010	15,240	SIRIM QAS

A.3 Brief description of project activity

Project location: PKS Victorindo Alam Lestari, Sumatera Utara, Indonesia

The project activity will capture and combust methane gas produced from the anaerobic portion of an existing wastewater treatment system in Sumatera Utara, Indonesia. The project activity utilizes a simple, effective and reliable technology to capture lagoon-produced biogas: installing sealed covers over existing anaerobic POME lagoons to create an anaerobic digester system. POME will continue to flow from the anaerobic treatment section to other lagoons and/or land application so that the effluent discharge requirements can be met. The captured biogas will be routed to one or more high temperature, enclosed flares to destroy methane gas as it is produced. Digester sludge will continue to be handled as in the past: it is occasionally pumped into drying beds and is used as fertilizer for oil palm trees.

The mill has the option to use the captured methane for renewable energy, however no CER is claimed for this activity and it is not considered part of the project activity.

A.4 Status of project implementation and operation

A.4.1 Technology

This project technology includes the installation of an anaerobic digester and gas collection and combustion system. Technology installed is as described in the PDD.

A.4.2 Project equipment

The methane recovery and flaring components of the project activity have been implemented. Construction of the digesters and methane recovery system was completed and become operational on 19 June 2008

The mill has the option to utilize the methane captured for renewable energy; however, this renewable energy component was not implemented during this monitoring period.

A.4.3 Monitoring and metering equipment

This project monitoring and metering equipment includes the installation of a gas meter, temperature sensing device, and data capture system. Equipment is installed as described in the PDD.

Section B Monitoring systems and procedures including quality assurance and quality control measures applied

B.1 Monitoring systems overview

Flare and Biogas Monitoring System

The monitoring system (referred to as the data logger) captures and stores readings from the mass flow meters and thermocouples from the flare system. These readings are transmitted to a centralized data storage location. The data from each flare system will be monitored by the Operations, Maintenance & Monitoring (OMM) department to ensure the flare system is functioning properly.

Diagrams of flare combustion systems and monitoring system are shown in Figure 1.

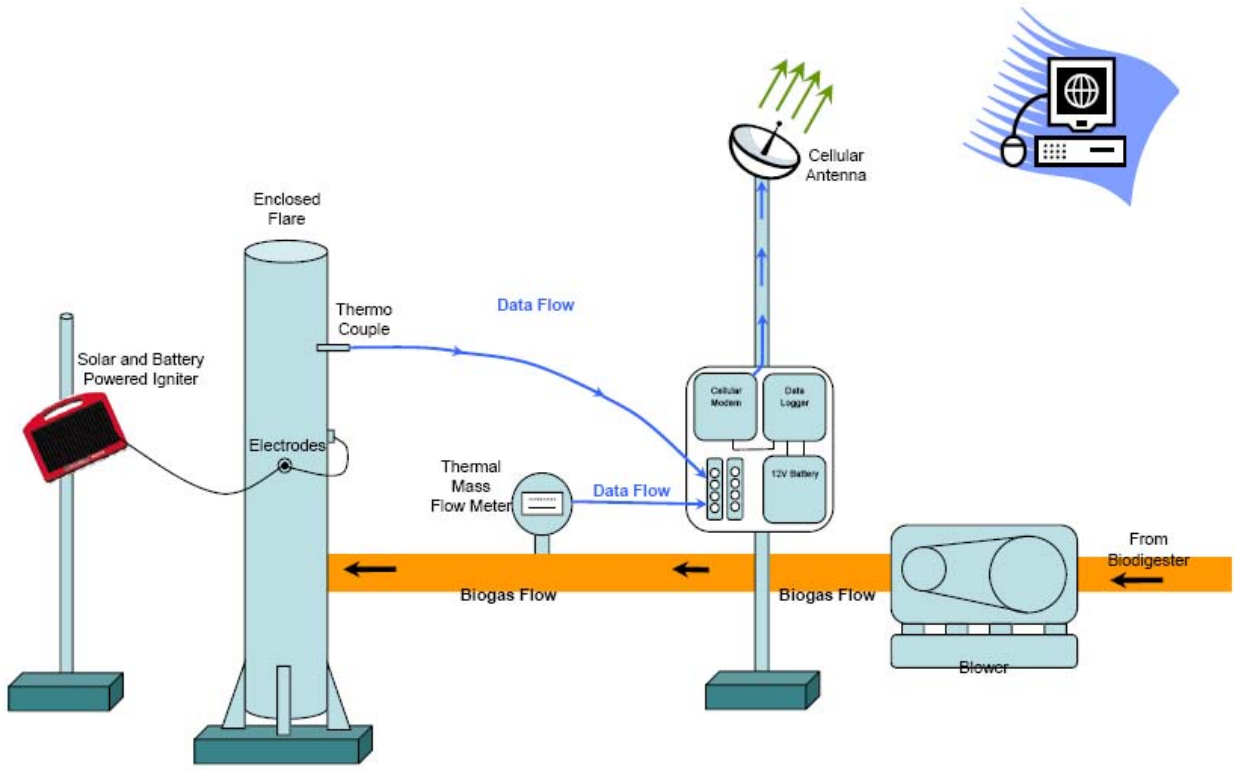

Figure 1. Diagram of Flare with Remote Monitoring System

B.2 Monitoring procedures

Monitoring system and monitoring manual has been developed to ensure accurate data capture during operation.

Field monitoring data is being collected by Regional Maintenance Technician, mill employee and by third party (accredited lab) and once the data has been collected; it is then sent directly to the main office for data integrity check, a joint effort by CDM Services Manager as the coordinator and by Operation: Science and Technology department. Once monitoring data has been thoroughly checked, the data is then uploaded to online storage system for safekeeping.

Detailed step by step procedure can be found in the monitoring manual

Diagrams monitoring data capture and transfer systems are shown in Figure 2.

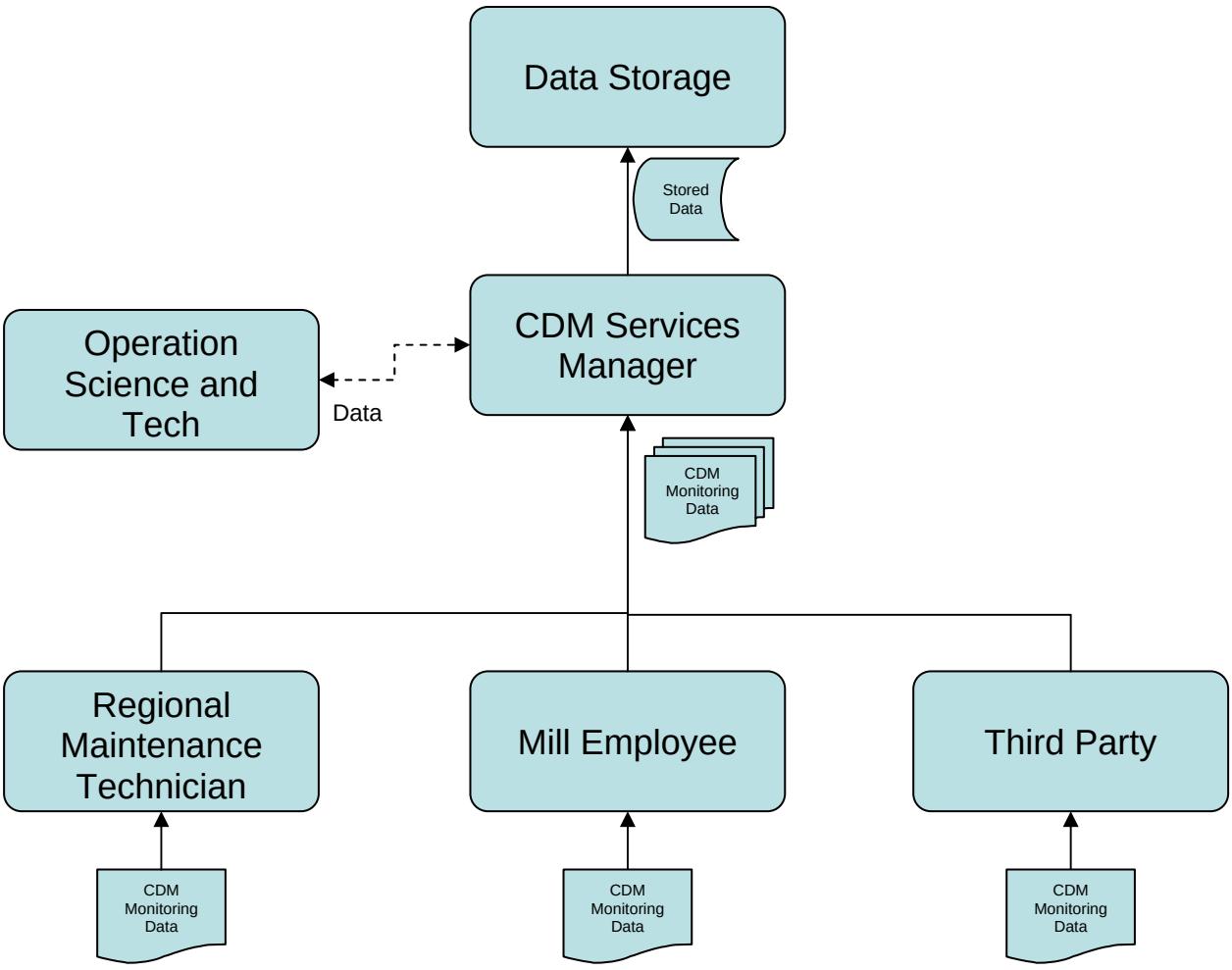

Figure 2. Diagram of monitoring data capture and transfer system

B.3 *The monitoring data for this project are monitored by the Operations, Maintenance & Monitoring (OMM) department with the following procedures based on the monitored parameters:* QA/QC measures applied

B.3.1 QA/QC roles and responsibilities

Complete work instructions and QA/QC roles and responsibilities are listed in Annex 4 of the PDD. Below is a summary of QA/QC responsibilities and documentation applied for the monitored parameters:

Parameter	Documentation	Performed by	QA/QC check performed by:
Volume of wastewater treated ($Q_{y,ww}$)	3rd party lab result	3rd party	3rd party
COD of wastewater entering the digester ($COD_{y,ww,untreated}$)	3rd party lab result	3rd party	3rd party
COD of treated wastewater ($COD_{y,ww,treated}$)	3rd party lab result	3rd party	3rd party
Biogas captured and flared (BGP_{flare})	Quarterly Monitoring Report (Electronic)	RMT	QA, OP
Biogas methane content (MC_{biogas})	Quarterly Monitoring Report (Electronic)	RMT	QA, OP
Flare combustion operation (CFE_{ww})	Paper/electronic from mill records	ME, RMT	QA, OP
Electricity generated by biomass ($EG_{Biomass}$)	Paper/electronic from mill records	ME, RMT	QA,OP
Electricity generated by diesel (EG_{Diesel})	Paper/electronic from mill records	ME, RMT	QA,OP
Electricity consumed by project ($EC_{project}$)	Equipment specification	RMT	QA,OP
End use of final sludge ($S_{f, end\ use}$)	Paper/electronic from mill record	ME, RMT	QA,OP
Processed fresh fruit bunch	Paper/electronic from mill record	ME, RMT	QA, OP

ME- Mill employee, RMT - Regional maintenance technician; QA - quality assurance; OP - operations

B.3.2 Training of operations and monitoring personnel

Below are all relevant trainings associated with the project

Training	Purpose	Description
Waste Water Treatment System	Normal Operation	Basic waste water treatment porcess, anaerobic treatment process & trouble shooting
PDD	Project Process Flow Reporting Procedure Monitoring Procedure Personnel Orientation	1) Monitoring parameters & requirements 2) Data logger manual for 1 flare system 3) Monitoring requirement - regulatory & biology
First Aid Training Level two	First Aid training	1) CPR practical 2) Simulation 3) AED demonstration 4) Fracture, Head and Spinal Injury Management system
Safety Presentation	Safety Video on Fatal 2006 Oilfield Explossion in Missippi	1) Electrical Safety 2) Hand and Power Tool 3) Safety & Awareness
First Aid Training Level two	First Aid training	1) CPR practical 2) Simulation 3) AED demonstration 4) Fracture, Head and Spinal Injury Management system
Defensive Driving Program	Safety and Security Training	2 Days Vehicle Defensive Driving Programme for Staff Development
Safety Presentation	Safety analysis Reporting Procedure Safety database management at docushare Incident Reporting and Escalation	1) Electrical Safety 2) Hand and Power Tool 3) Safety & Awareness
Maximo Training	Reporting Procedure Sub System Specific Module Normal Operation Data Collection & Quality Control	1) Maximo Overview 2) Training manual for WO 3) Training manual for puchasing 4) Training manual for service request
Site Performance Discussion	Project Process Flow Reporting Procedure Monitoring Procedure Normal Operation Personnel Orientation	1) Monitoring parameters & requirements 2) Data logger manual for 1 flare system 3) Monitoring requirement - regulatory & biology 4) Safety procedures (LOTO) for blower maintenance 5) Safety during sampling 6) SupaVac pump - overview
OMM Training	Project Process Flow Reporting Procedure Monitoring Procedure Normal Operation Personnel Orientation	1) Monitoring parameters & requirements 2) Data logger manual for 1 flare system 3) Monitoring requirement - regulatory & biology 4) Safety procedures (LOTO) for blower maintenance 5) Safety during sampling 6) SupaVac pump - overview
CDM Training	Project Process Flow Reporting Procedure Monitoring Procedure Normal Operation Personnel Orientation	1) Monitoring parameters & requirements 2) Data logger manual for 1 flare system 3) Monitoring requirement - regulatory & biology 4) Safety procedures (LOTO) for blower maintenance 5) Safety during sampling 6) SupaVac pump - overview
CDM Training	Project Process Flow Reporting Procedure Monitoring Procedure Normal Operation Personnel Orientation	1) Monitoring parameters & requirements 2) Data logger manual for 1 flare system 3) Monitoring requirement - regulatory & biology 4) Safety procedures (LOTO) for blower maintenance 5) Safety during sampling 6) SupaVac pump - overview

Section C Monitoring parameters and activities

C.1 Monitored parameters used to calculate emission reductions

Parameter	Unit	Description	Frequency	Data Source
BGP_{Flare}	Nm^3	Amount of biogas recovered and directed to flare for combustion	More often than hourly	Continuous flow meter
MC_{biogas}	% CH_4 (volume)	Methane content of biogas	Quarterly	Gas analyser
CFE_{ww}	%	Flares shall be operated in accordance with manufacturer specifications. Flare combustion temperature and biogas flow rate data will be recorded more frequently than hourly. If in any specific hour either of these parameters is out of specification, a flare efficiency of 50% will be used for this specific hour. If at any given time the temperature of the flare is below 500C, 0% efficiency will be used for this period Provided these parameters are within specification, a value of 0.9 shall be used	More often than hourly	Thermocouple (flare temperature) and gas analyzer (biogas flow rate)
$PE_{y, power}$	tCO_2	Emissions from electricity or diesel consumption	n/a	Facility records, Equipment specification
EG_{diesel}	kWh	Electricity produced by on-site diesel generators	Annually	Facility records
$EG_{biomass}$	kWh	Electricity produced by on-site biomass generators	Annually	Facility records
$EC_{project}$	kWh	Electricity consumed by project	n/a	Equipment specification

C.2 Additional monitored parameters

Parameter	Unit	Description	Frequency	Data Source
$Q_{y,ww}$	m^3	Volume of wastewater treated	Annually	Mill records and 3rd party verified conversion factor
$COD_{y,ww,untreated}$	Tonnes/m^3	Chemical oxygen demand of wastewater entering the anaerobic treatment system	Semi-annually	3rd party sampling
$COD_{y,ww,treated}$	Tonnes/m^3	Chemical oxygen demand of wastewater treated in the anaerobic treatment system	Semi-annually	3rd party sampling
$S_{f,end\ use}$		End use of final sludge	Verified quarterly	Desludging record
$FFB_{processed}$	Tonnes	FFB processed by mill	Annually	Mill records
BGP_{RE}	m^3	Amount of biogas recovered and directed to renewable energy unit	More often than hourly	Continuous flow meter
RE_{ON}	°C	Signal to prove the renewable energy unit is combusting the biogas	More often than hourly	Renewable energy unit mounted thermocouple

C.3 Monitoring Activities

Discrepancies, outages or failures occurred during this monitoring period are listed in appendix 1 of this report.

Effluent conversion factor from FFB to wastewater volume was site verified by third party laboratory with result factor of 0.8 m^3 of wastewater per ton of FFB

The Project Activity data was collected in accordance with the registered PDD, and approved monitoring methodology, AMS IIIH V.7. The data shown in Table C.2 is a summation or average of the required waste water parameters that are to be monitored.

No renewable energy unit was utilized during the crediting period and all biogas were directed to the flare unit, consequently no monitoring activities are required for amount of biogas recovered and directed to Renewable Energy Unit (BGP_{RE}) and signal to prove the Renewable Energy Unit is combusting the biogas (RE_{ON})

During crediting period, no sludge were removed from the project activity and consequently end use of final sludge ($S_{f, end\ use}$) were note required to be monitored during crediting period and the methane emission from anaerobic decay of the final sludge were neglected.

Table C.2. Monitored Data

Year	Month	Volume of waste water (m^3)	COD Untreated Tonnes/m^3	COD Treated Tonnes/m^3	Biogas Flared (Nm^3)	CH_4 %	Flare Efficiency (%)	Total Methane destroyed (Tonnes)	Electricity produced from biomass (kWh)	Electricity produced from diesel (kWh)	Electricity consumed by project equipment (kWh)	Final Sludge end use
		$Q_{y,ww}$	$COD_{y,ww,untreated}$	$COD_{y,ww,treated}$	BGP_{Flare}	MC_{biogas}	CFE_{ww}	MDy	$EG_{biomass}$	EG_{diesel}	$EC_{project}$	
2009	1	25,329	0.0408400	0.0071650	0	61.36	90.00%	0.00	1,355,170	26,354	17,164	0
2009	2	16,873	0.0380233	0.0095000	41,232		90.00%	17.95	1,355,170	26,354	17,164	0
2009	3	19,542	0.0393200	0.0084325	59,508		90.00%	25.94	1,355,170	26,354	17,164	0
2009	4	20,826	0.0376200	0.0073420	85,417	64.50	90.00%	37.36	1,355,170	26,354	17,164	0
2009	5	23,108	0.0422300	0.0050700	73,246		90.00%	31.93	1,355,170	26,354	17,164	0
2009	6	24,437	0.0341600	0.0073400	120,695		90.00%	52.62	1,355,170	26,354	17,164	0
2009	7	25,738	0.0345500	0.0072350	88,898	77.00	90.00%	38.86	1,355,170	26,354	17,164	0
2009	8	23,579	0.0356100	0.0048600	166,577		90.00%	33.63	1,355,170	26,354	17,164	0
2009	9	19,117	0.0388650	0.0081100	192,242		90.00%	85.88	1,355,170	26,354	17,164	0
2009	10	25,570	0.0351200	0.0078075	197,093	64.95	90.00%	87.24	1,355,170	26,354	17,164	0
2009	11	22,208	0.0359700	0.0081050	154,602		90.00%	68.25	1,355,170	26,354	17,164	0
2009	12	19,318	0.0386000	0.0086400	184,423		90.00%	78.03	1,355,170	26,354	17,164	0
2010	1	15,422	0.0386000	0.0086400	187,038	65.80	90.00%	82.63	993,550	21,822	17,164	0
2010	2	12,809	0.0386000	0.0086400	192,774		90.00%	85.55	993,550	21,822	17,164	0

Table C.2. Monitored data

C.4 Special events

C.4.1 Equipment outages

During monitoring period, outages that occur are categorized into 2 events:

1. Forced outage, unplanned suspension of normal operation due to unforeseen factor such as: power loss, system interlock, biological condition.
2. Scheduled outage, planned suspension of normal operation such as: equipment replacement, maintenance.

During outages, no data were recorded as reflected in the data collection spreadsheet.

Equipment outages experienced and system impact during this crediting period are listed in appendix 1.

C.4.2 Equipment removal and replacements

Equipment removed or replaced and system impact (if any) during this reporting period is listed below:

		MMD	Serial Number	Date of Install	Date of Replacement	Comments	WO
Biogas Flow Meters	Flare 1	FCI Flow Meter ST50	291297	19-Jun-08	6-Apr-09	Replaced with SN 295700 - Flare 1 Ground flare	3868
		FCI Flow Meter ST50	295700	6-Apr-09	TBD	Current	
	Flare 2	FCI Flow Meter ST50	291298	19-Jun-08	6-Apr-09	Replaced with SN 295689, Flare 2 Ground flare	3868
		FCI Flow Meter ST50	295689	6-Apr-09	TBD	Current	
Thermocouple	Flare 1	thermocouple flare 1	n/a	19-Jun-08	5-Mar-09	first installation	n/a
		thermocouple flare 1	n/a	5-Mar-09	21-Aug-09	first installation replaced with 18"	n/a
		thermocouple flare 1	n/a	21-Aug-09	TBD	Replaced thermocouple due to malfunction	8717
	Flare 2	thermocouple flare 2	n/a	19-Jun-08	5-Mar-09	first installation	n/a
		thermocouple flare 2	n/a	5-Mar-09	10-Nov-09	first installation replaced with 18"	n/a
		thermocouple flare 2	n/a	10-Nov-09	8-Dec-09	Replaced thermocouple due to malfunction	14779
		thermocouple flare 2	n/a	8-Dec-09	TBD	Replaced thermocouple due to malfunction	14439
Data Logger		Data Logger NI module 9211	1343B91	19-Jun-08	TBD	replace no later than 10 June 2010	
		Data Logger NI module 9203	134FFC7	19-Jun-08	TBD	replace no later than 10 June 2010	

Section D Calibration of monitoring instruments

D.1 Measuring and monitoring device (MMD) requiring calibration

All equipment was factory calibrated by the manufacturers and in accordance with the manufacturers, initial calibration period started after initial usage in the system.

		MMD	Serial Number	Calibration Date	Calibration Expires	Comments
Gas Flow Meters	F1	FCI Flow Meter ST50	291297	8-May-08	7-Nov-09	installed on 10 June 2008, replaced on 5 Nov 2009, flare 2 ground flare
		FCI Flow Meter ST50	291298	8-May-08	7-Nov-09	installed on 10 June 2008, replaced on 5 Nov 2009, flare 2 ground flare
	F2	FCI Flow Meter ST50	295700	13-Oct-08	12-Apr-10	installed on 5 Nov 2009, flare 2 ground flare
		FCI Flow Meter ST50	295689	13-Oct-08	12-Apr-10	installed on 5 Nov 2009, flare 2 ground flare
Gas Analyzer		Gas analyzer ADC LFG 20	1139	19-Aug-08	19-Aug-09	Calibration at once a year
		Gas analyzer ADC LFG 20	1139	17-Jun-09	17-Jun-10	Calibration at once a year
		Gas analyzer Landtec	BM12142	12-Jan-10	12-Jul-10	Calibration every 6 month
Data Logger		Data Logger NI module 9211	1343B91	25-Feb-08	19-Jun-10	First installation till present (raw data recorded)
		Data Logger NI module 9203	134FFC7	13-Jun-08	19-Jun-10	First installation till present (raw data recorded)

Section E Emission factors, IPCC default and other reference values

E.1 Fixed values

Parameter	Value	Description
D_{CH4}	0.000718 tCH_4/m^3CH_4	Density of methane at normal conditions in accordance with manufacturer
GWP_{CH4}	21	Global warming potential of methane (IPCC default, AMS.III.H ver.5)
EF_{diesel}	0.8 $kgCO_2/kWh$	Emission factor for on-site diesel generators (default value for >200kW system per AMS.I.D ver. 15 methodology, table 1.D.1)

Section F Applicable deviations or approved post registration changes

F.1 Deviation to the monitoring plan

No deviation was reported during crediting period.

F.2 Approved changes to registered PDD

There were no requested or approved changed to the registered PDD

Section G Calculation of GHG emissions

G.1 Emission reductions

In accordance with AMS-III.H, version 7, paragraph 16:

> *"…the calculation of emission reductions shall be based on the amount of methane recovered and fuelled or flared that is monitored ex-post. Also for these cases, the project emissions and leakage will be deducted from the emission reductions calculated from the methane recovered and combusted."*

Total emission reductions are calculated as follows, as modified from ACM0001:

$$ER_y = (MD_y * GWP\ CH_4) - PE_y$$

Where:

ER_y	Emission reductions in the year "y" (tonnes CO_2e)
MD_y	Amount of methane fuelled and flared in year "y" (tonnes CH_4)
$GWP\ CH_4$	Global warming potential for CH_4
PE_y	Project activity emissions in the year y (tonnes CO_2e)

G.2 Amount of methane destroyed

The total amount of methane destroyed (MD) is determined as follows:

$$MD_y = (BGP_{flare,y} + BGP_{RE,y}) * MC_{biogas,y} * D_{CH4} * CFE_{ww}$$

Where:

$\mathbf{MD_y}$	Amount of methane destroyed in year "y" (tonnes)
$\mathbf{BGP_{flare,y}}$	Amount of biogas recovered and directed to flare for combustion (Nm^3)
$\mathbf{BGP_{RE,y}}$	Amount of biogas recovered and directed to renewable energy system (Nm^3)
$\mathbf{MC_{biogas,y}}$	Methane content of biogas during the year "y" (%)
$\mathbf{D_{CH4}}$	Density of Methane at normal conditions (tCH_4/m^3CH_4)
$\mathbf{CFE_{ww}}$	Efficiency of flaring process (%)

Since the renewable energy system is not utilized yet, the value of $\mathbf{BGP_{RE,y}}$ is zero for this monitoring period.

G.3 Project Emissions

The project emissions in the year "y" are calculated as follows:

$$\mathbf{PE_y = PE_{y,\ power}}$$

Where:

$\mathbf{PE_y}$	Project activity emissions in the year "y" (tonnes CO_2e)
$\mathbf{PE_{y,\ power}}$	Emissions from electricity or diesel consumption in the year "y" (tonnes CO_2e)

The project emissions from electricity consumption are conservatively calculated based upon the total kilowatt hours (kWh) consumed by project activity equipment. To remain conservative, equipment is assumed to be in operation 24 hours per day, 365 days per year.

The following formula is used to convert the data to tCO2e:

$$\mathbf{PE_{y,\ power} = EC_{project} * \%EG_{diesel} * EF_{diesel} / 1000}$$

Where:

$\mathbf{PE_{y,\ power}}$	Project emissions due to electricity consumption of equipment (tCO2e/yr)
$\mathbf{EC_{project}}$	Amount of electricity consumed by project equipment (kWh)
$\mathbf{\%EG_{diesel}}$	Percentage of total site electricity derived from diesel generators
$\mathbf{EF_{diesel}}$	Emission factor for diesel generator system (0.8 $kgCO_2/kWh$)

The electricity required to operate project equipment was sourced from the mill. The mill is not grid connected. The mill produces its own electricity primarily from biomass turbines, with diesel fuel used as a backup power source. Therefore, percentage of electricity derived from diesel generators is determined as follows:

$$\mathbf{\%EG_{diesel} = EG_{diesel} / (EG_{diesel} + EG_{biomass})*100\%}$$

Where:

$\mathbf{EG_{diesel}}$	Amount of electricity produced on-site by diesel generators (kWh)
$\mathbf{EG_{biomass}}$	Amount of electricity produced on-site by biomass turbines (kWh)

Section H Summary of Emission Reductions

H.1 Amount of methane destroyed

The total amount of methane destroyed (MDy) for the current monitoring period is shown in Table H.1. Default value of the efficiency of the flaring / combustion process (CFEww) of 90% and periodical methane content (MCbiogas) has already been incorporated within the calculation of Biogas flared (BGP flare). Detailed information on continuous monitoring of the site was made available to and verified by the DOE.

Table H.1. Amount of methane destroyed				
Year	Month	Biogas flared (Nm^3)	Density of Methane ($tonnes/m^3$)	Total Methane destroyed (Tonnes)
		BGP_{Flare}	D_{CH4}	MD_y
2009	1	0	0.0007179	0.00
2009	2	41,232		17.95
2009	3	59,508		25.94
2009	4	85,417		37.36
2009	5	73,246		31.93
2009	6	120,695		52.62
2009	7	88,898		38.86
2009	8	166,577		33.63
2009	9	192,242		85.88
2009	10	197,093		87.24
2009	11	154,602		68.25
2009	12	184,423		78.03
2010	1	187,038		82.63
2010	2	192,774		85.55
			Total	**725.88**

Table H.1. Methane destroyed

H.2 Methane Content

The periodical measurement of methane content (MCbiogas) for the current monitoring period is shown in Table H.2. Detailed information on continuous monitoring of the site was made available to and verified by the DOE.

Table H.2. Periodical Methand Content

Year	Quarter	Month	CH_4 %
			MC_{biogas}
2009	1	1	61.36
2009		2	
2009		3	
2009	2	4	64.50
2009		5	
2009		6	
2009	3	7	77.00
2009		8	
2009		9	
2009	4	10	64.95
2009		11	
2009		12	
2010	1	1	65.80
2010		2	

Table H.2. Methane content

H.3 Project emissions

Project emissions from the consumption of electricity are shown in Table H.3.

Table H.3. Project Emissions							
Year	Month	Electricity Generation from Biomass Turbine ($EG_{biomass}$)	Electricity Generation from Diesel Generator (EG_{diesel})	Percentage of Electricity from diesel generators ($\%EG_{diesel}$)	Diesel Emission Factor	Total Project Power Consumption	Project Emission from Electricity Consumption (tCO2e)
		kWh	kWh	%	kg CO2/kWh	kWh	$PE_{y, power}$
2009	1	1,355,170	26,354	1.91%	0.80	17,164	0.26
2009	2	1,355,170	26,354	1.91%	0.80	17,164	0.26
2009	3	1,355,170	26,354	1.91%	0.80	17,164	0.26
2009	4	1,355,170	26,354	1.91%	0.80	17,164	0.26
2009	5	1,355,170	26,354	1.91%	0.80	17,164	0.26
2009	6	1,355,170	26,354	1.91%	0.80	17,164	0.26
2009	7	1,355,170	26,354	1.91%	0.80	17,164	0.26
2009	8	1,355,170	26,354	1.91%	0.80	17,164	0.26
2009	9	1,355,170	26,354	1.91%	0.80	17,164	0.26
2009	10	1,355,170	26,354	1.91%	0.80	17,164	0.26
2009	11	1,355,170	26,354	1.91%	0.80	17,164	0.26
2009	12	1,355,170	26,354	1.91%	0.80	17,164	0.26
2010	1	993,550	21,822	2.15%	0.80	17,164	0.30
2010	2	993,550	21,822	2.15%	0.80	17,164	0.30
						Total	**3.73**

Table H.3. Project emission from consumption of diesel fuel

H.4 Total emission reductions during the monitoring period

Emission reductions achieved during the current monitoring period are shown in table H.4.

Table H.4. Emission Reductions				
Monitoring Period	Total methane destroyed (tCH_4)	Global warming potential of methane	Project Emission from Electricity Consumption (tCO2e)	Emission reduction (t CO2e)
	MD_y	GWP_{CH4}	$PE_{y, power}$	ER_y
16 January 2009 - 28 February 2010	725.88	21	3.73	**15,240**

Table H.4. Emission Reductions

The total emission reductions being requested for this monitoring period is **15,240 tCO_2e.**

Section I Comparison of actual ERs to PDD estimated ERs

I.1 Emission reduction estimated for this monitoring period

Source	Dates		ERs
	From	To	
Registered PDD Estimate	16 Jan 2009	28 Feb 2010	43,838

I.2 Emission reduction actually achieved during this monitoring period

Source	Dates		ERs
	From	To	
Actual emission reductions claimed during this monitoring period	16 Jan 2009	28 Feb 2010	15,240

I.3 Explanation on any significant increase between estimated and claimed emission reductions

There was no significant increase between the registered PDD and claimed emission reductions during this period.

Section J List of supporting documents

The additional documentation listed in the table below was provided to the DOE in support of this monitoring report.

Item	Document	Description	Confidential
1	File: MR01-AIN07-W-04 Monitoring Report VAL Calculation (2009-2010) v1.xls	Spreadsheet of calculation of emission reductions	No
2	ID0012WWP-VAL-AMS IIIH v7 POME ER Spreadsheet-2009_MR_V1.xls	Operational Spreadsheet for monitoring data collection	Yes
3	ID0012WWP-VAL-AMS IIIH v7 POME ER Spreadsheet-2010_MR_V1.xls	Operational Spreadsheet for monitoring data collection	Yes

APPENDIX 1

Outage log that occur during crediting period from 16 January 2009 – 28 February 2010

Outage Log		
Site:	Victorindo Alam Lestari	
UNFCCC Ref#	2130	
Month	February	
Year	2009	
Day	**Outage Log**	**Comment**
1	missing data slot at 0.00-23.50	Due to power loss (Forced)
2	missing data slot at 0.00-23.50	Due to power loss (Forced)
3	missing data slot at 0.00-16.30	Due to power loss (Forced)
4	faulty data wire from flowmeter to data logger at 2.30-11.20	faulty data wire from flowmeter to data logger
5	faulty data wire from flowmeter to data logger at 10.50-12.20; missing data slot at 13.40-14.10	faulty data wire from flowmeter to data logger; due to pwer loss (Forced)
6	faulty data wire from flowmeter to data logger at 9.20-23.50 at flare 2	faulty data wire from flowmeter to data logger
7	faulty data wire from flowmeter to data logger at 0.00-23.50 at flare 2	faulty data wire from flowmeter to data logger
8	faulty data wire from flowmeter to data logger at 0.00-20.30 at flare 2	faulty data wire from flowmeter to data logger
9		
10		
11		
12	faulty data wire from flowmeter to data logger at 9.50-23.50 at flare 2	faulty data wire from flowmeter to data logger
13	faulty data wire from flowmeter to data logger at 0.00-23.50 at flare 2	faulty data wire from flowmeter to data logger
14	faulty data wire from flowmeter to data logger at 0.00-7.40 at flare 2	faulty data wire from flowmeter to data logger
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26	faulty data wire from flowmeter to data logger at 22.50-23.50 at flare 2	faulty data wire from flowmeter to data logger
27	faulty data wire from flowmeter to data logger at 0.00-23.50 at flare 2	faulty data wire from flowmeter to data logger
28	faulty data wire from flowmeter to data logger at 0.00-13.50 at flare 2; flares off at 14.00-23.50	faulty data wire from flowmeter to data logger
Notes		
Scheduled	Planned stoppage	
Forced	Unplanned stoppage	

Outage Log		
Site:	Victorindo Alam Lestari	
UNFCCC Ref#	2130	
Month	March	
Year	2009	

Day	Outage Log	Comment
1		
2		
3		
4		
5	faulty data wire from thermocouple to data logger at 10.40-10.50	Due to equipment replaced (thermocouple) scheduled
6	faulty data wire from flowmeter to data logger at 0.00-23.50 at flare 2;	faulty data wire from flowmeter to data logger
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20	missing data slot at 8.10-8.50, 15.00-23.50	Due to power loss (Forced)
21	missing data slot at 0.00-23.50	Due to power loss (Forced)
22	missing data slot at 0.00-23.50	Due to power loss (Forced)
23	missing data slot at 0.00-23.50	Due to power loss (Forced)
24	missing data slot at 0.00-23.50	Due to power loss (Forced)
25	missing data slot at 0.00-14.50	Due to power loss (Forced)
26	missing data slot at 7.00	Due to power loss (Forced)
27		
28	faulty data wire from flowmeter to data logger at 13.30-23.50 at flare 2	faulty data wire from flowmeter to data logger
29	faulty data wire from flowmeter to data logger at 0.00-23.50 at flare 2	faulty data wire from flowmeter to data logger
30	faulty data wire from flowmeter to data logger at 0.00-23.50 at flare 2	faulty data wire from flowmeter to data logger
31	faulty data wire from flowmeter to data logger at 0.00-23.50 at flare 2, missing data slot at 10.10	faulty data wire from flowmeter to data logger, Due to power loss (Forced)

Notes	
Scheduled	Planned stoppage
Forced	Unplanned stoppage

Outage Log		
Site:	Victorindo Alam Lestari	
UNFCCC Ref#	2130	
Month	April	
Year	2009	

Day	Outage Log	Comment
1	faulty data wire from flowmeter to data logger at 0.00-17.00 at flare 2	
2		
3	faulty data wire from flowmeter to data logger at 7.40-8.10 at flare 2	
4		
5		
6	missing data slot at 10.20-11.30	Due to equipment swap (flowmeter) scheduled
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		

Notes		
Scheduled	Planned stoppage	
Forced	Unplanned stoppage	

Outage Log		
Site:	Victorindo Alam Lestari	
UNFCCC Ref#	2130	
Month	July	
Year	2009	

Day	Outage Log	Comment
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17	missing data slot at 21.40-22.00	Due to power loss (Forced)
18	missing data slot at 10.20-11.30, 12.00, 13.00,13.40,14.40,15.10	Due to power loss (Forced)
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30	missing data slot at 16.10-16.50,18.10-18.40	Due to equipment replaced (thermocouple) scheduled
31		

Notes	
Scheduled	Planned stoppage
Forced	Unplanned stoppage

Outage Log		
Site:	Victorindo Alam Lestari	
UNFCCC Ref#	2130	
Month	August	
Year	2009	

Day	Outage Log	Comment
1		
2		
3		
4		
5		
6		
7	data logger drift at 3.30	
8		
9	missing data slot at 18.40,19.00-19.10	Due to power loss (Forced)
10		
11		
12	faulty thermcouple wire flare 1 at 2.30 and 3.10	
13		
14		
15		
16		
17		
18		
19		
20		
21	data logger drift at 12.00	Due to equipment replaced (thermocouple) scheduled
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		

Notes	
Scheduled	Planned stoppage
Forced	Unplanned stoppage

Outage Log		
Site:	Victorindo Alam Lestari	
UNFCCC Ref#	2130	
Month	September	
Year	2009	

Day	Outage Log	Comment
1		
2		
3		
4		
5		
6		
7		
8		
9	data logger drift at 23.00	
10		
11		
12		
13		
14		
15	missing data slot at 17.00,18.20,	Due to power loss (Forced)
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26	missing data slot at 16.00	Due to power loss (Forced)
27		
28	missing data slot at 16.10	Due to power loss (Forced)
29		
30	missing data slot at 17.30-17.40	Due to power loss (Forced)

Notes	
Scheduled	Planned stoppage
Forced	Unplanned stoppage

Outage Log		
Site:	Victorindo Alam Lestari	
UNFCCC Ref#	2130	
Month	October	
Year	2009	

Day	Outage Log	Comment
1	missing data slot at 16.10	Due to power loss (Forced)
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25	data logger drift 1.20	
26		
27		
28		
29		
30		
31	missing data slot at 14.50, 20.30	Due to power loss (Forced)

Notes	
Scheduled	Planned stoppage
Forced	Unplanned stoppage

Outage Log

Site:	Victorindo Alam Lestari	
UNFCCC Ref#	2130	
Month	November	
Year	2009	

Day	Outage Log	Comment
1		
2	data logger drift at 20.10	
3		
4		
5		
6	faulty wire from thermocouple to data logger at 4.30-16.10	
7		
8		
9		
10		Due to equipment replaced (thermocouple) at flare 2 scheduled
11		
12	data logger drift at 22.10	
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26	data logger drift at 20.40	
27		
28		
29		
30		
31		

Notes		
Scheduled	Planned stoppage	
Forced	Unplanned stoppage	

Outage Log		
Site:	Victorindo Alam Lestari	
UNFCCC Ref#	2130	
Month	December	
Year	2009	

Day	Outage Log	Comment
1		
2		
3		
4		
5		
6		
7	thermocouple faulty wire at flare 1 16.30-17.00, flare 2 16.30-23.50	Forced
8	data logger drift at 6.10; thermocouple faulty wire at flare 2 at 0.00-13.10	Due to equipment replaced (thermocouple) at flare 2 scheduled
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19	missing data slot at 16.20-23.50	Due to power loss (Forced)
20	missing data slot at 0.00-23.50	Due to power loss (Forced)
21	missing data slot at 0.00-23.50	Due to power loss (Forced)
22	missing data slot at 0.00-23.50	Due to power loss (Forced)
23	missing data slot at 0.00-14.20	Due to power loss (Forced)
24		
25		
26		
27		
28		
29		
30		
31		

Notes	
Scheduled	Planned stoppage
Forced	Unplanned stoppage

Outage Log		
Site:	Victorindo Alam Lestari	
UNFCCC Ref#	2130	
Month	January	
Year	2009	

Day	Outage Log	Comment
1		
2		
3		
4		
5	data logger drift at 18.00	
6		
7		
8		
9		
10		
11		
12	data logger reset at 11.40	
13		
14		
15	data logger drift at 1.00	
16		
17		
18		
19	Missing data slot at 15.30-16.10, 16.30-16.50, 17.10-17.30	
20	data logger drift at 9.50,20.40, 21.00 , data logger reset at 20.10	
21	data logger reset at 8.50, 10.30	
22		
23		
24		
25		
26		
27		
28		

Notes	
Scheduled	Planned stoppage
Forced	Unplanned stoppage