UNFCCC
Clean Development Mechanism
Small-Scale Activity Monitoring Report

AWMS Methane Recovery Project MX06-S-36, Coahuila, Durango and Nuevo Leon, Mexico

Monitoring Period: 19 Dec 2006 – 31 Jan 2010

CDM Registration number: UNFCCC0658

Document ID: MR01-MX06-S-36, V.1
Date: 01 March 2010

CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROJECT ACTIVITY MONITORING REPORT

CONTENTS

Section A General Project Activity Information

A.1 Title of the project activity:

AWMS Methane Recovery Project MX06-S-36, Coahuila, Durango and Nuevo Leon, Mexico

A.2 Project participants:

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
México (host)	AgCert México Servicios Ambientales, S. de R.L. de C.V.	No
United Kingdom of Great Britain and Northern Ireland	AgCert International Ltd.	No
Switzerland	AgCert International Ltd.	No

A.3 Crediting period:

A.3.1 Crediting period:

The crediting period for this project activity is from 19 December 2006 through 18 December 2016.

A.3.2 Total estimated emission reductions over the crediting period:

The total estimated emissions reduction over the 10 year project period as documented in the PDD is 128,310 Tonnes of CO_2 equivalent.

A.4 Project activity description and background:

Construction of all sites was completed and monitoring commenced as indicated in Table A.1.

Site			Monitoring Start Date
Legal Entity	ID	Name	
Oscar Garcia Guajardo	1335631	Rancho El Tropezon	24-Apr-06
Jorge Murra Martinez y Coopropietarios	2000004	Granja Porcina El Cerrito Sitio 1	10-Apr-06
	2000005 / 2000006	Granja Porcina Guadalupe Sitio II / Granja Porcina Guadalupe Sitio III	10-Apr-06

Table A.1. Monitoring Start Dates for Individual Sites

Section B Monitoring of a CDM project activity

B.1 Monitoring report:

B.1.1 Monitoring reports associated with this project activity:

Table B.1 lists all monitoring reports associated with this project activity.

Report Number	Dates		Resulting emission reductions	Verifying DOE
	From	To		
MR01-MX06-S-36 (current report)	19 Dec 2006	31 Jan 2010	See B.1.2	DNV

Table B.1. Monitoring reports submitted for project activity

B.1.2 Emission reductions achieved over the monitored period:

THE EMISSIONS REDUCTION ACHIEVED OVER THE DESIGNATED MONITORING PERIOD IS 18,425 TONNES OF CO_2 EQUIVALENT

B.2 Methodologies applied:

This project activity utilized the CDM-approved methodology AMS III.D, Version 9: *Methane recovery.*

B.3 Monitoring plan:

As indicated in section D.5 of the registered PDD, the Monitoring Plan in Annex 3 of the PDD was developed based on the approved methodology identified in paragraph B.2.

B.4 Monitored Data Parameters:

Values for all monitored data parameters and their associated references are available below and in the PDD associated with this project.

Table B.2. Monitored Data

Data / Parameter	Value	Description / Source
BGP	Variable	Biogas produced recorded monthly
MC	Variable	Methane content of biogas
CEE	100% less any time the flare is out of service and gas is flowing	Fraction of time in which gas is combusted
EFP	variable	Flare efficiency as defined in the registered PDD, Table D.1.

B.5 Baseline data:

The AWMS for the baseline is an open lagoon and is continually operational, unless otherwise noted. The baseline data is presented in the registered PDD according to the approved methodology, AMS.III-D.

B.6 Monitored project activity data:

The AWMS for the project activity is an anaerobic digester and is continually operational, unless otherwise noted. The project activity data collected in accordance with the registered PDD and approved methodology, AMS.III-D, is shown in Table B.3. Methane has been calculated using a formula of 100% - CO2% - 6% for trace gases per the approved Request for Deviation for Measurement of Percentage of Biogas that is Methane and Flare Efficiency for trace gases for the period prior to direct methane readings. All sites had direct methane measurements by November 25, 2008.

Table B.4 below provides the Combustion Equipment Efficiency, which is a measure of the percent of the time the site was operational.

Table B.5 below provides the Flare Efficiency of the site that was applied for the period. Prior to the first Flare Efficiency Test performed at the site, a conservative 50% was applied based on the approved Request for Deviation.

Table B.3. Project Activity Data					
Year	Month	Temp (°C)	Biogas (m^3)	CO_2 (%)	CH_4 (%)
2006	12	15.74	44242.86	27.1	66.9
2007	1	15.22	53358.5	25.7	68.3
2007	2	18.09	60395.04		
2007	3	21.73	119626.22		
2007	4	24.35	119271.33	27.4	66.6
2007	5	26.96	132050.37		
2007	6	27.87	129916.7		
2007	7	27.99	81489.83	30.3	63.7
2007	8	27.74	58091.61		
2007	9	26.86	60112.61		
2007	10	23.47	85679.31	30.9	63.1
2007	11	19.75	112689.54		
2007	12	16.70	76435.85		
2008	1	16.94	57361.26	30.3	63.7
2008	2	19.00	47134.15		
2008	3	22.11	28167.7		
2008	4	25.30	20262.61	29.5	64.5
2008	5	27.86	27074.34		
2008	6	28.84	44814.82		
2008	7	28.05	74229.71	29.7	66.3
2008	8	27.49	98231		
2008	9	25.47	76282.76		
2008	10	23.05	65295.45	32.3	58.4
2008	11	19.85	37556.52		
2008	12	17.39	61198.7		
2009	1	16.91	59607.03	34.4	52.9
2009	2	18.64	58705.95		
2009	3	21.52	49919.74		
2009	4	26.43	39168.96	33.0	55.4
2009	5	27.80	46623.77		
2009	6	29.30	74869.57		
2009	7	30.19	78992.62	32.8	66.1
2009	8	29.14	71380.13		
2009	9	26.07	60700.1		
2009	10	23.30	49710.59	35.0	64.6
2009	11	20.02	63430.52		
2009	12	15.24	42588.42		
2010	1	14.60	47407.57	33.2	66.3

Table B.3. Project Activity Data

Combustion Equipment Efficiency (ID3)			
	Site ID		
Quarter ending	1336631	2000004	2000005/ 2000006
Dec-06	100%	100%	100%
Mar-07	100%	100%	98%
Jun-07	86%	100%	90%
Sep-07	100%	100%	100%
Dec-07	100%	100%	100%
Mar-08	100%	100%	100%
Jun-08	100%	100%	100%
Sep-08	100%	100%	100%
Dec-08	100%	100%	100%
Mar-09	100%	100%	100%
Jun-09	100%	100%	100%
Sep-09	100%	100%	100%
Dec-09	100%	100%	100%
Jan-10	100%	100%	100%

Table B.4. Combustion Equipment Efficiency (ID3)

PDD	Site ID	Monitoring Period		Period Applied	Applied FE	Period Applied	Applied FE	Period Applied	Applied FE	Period Applied	Applied FE
		Start	End								
MX06-S-36	1335631	12/19/2006	1/31/2010	12/19/2006 - 8/28/2007	50.00%	8/29/2007 - 1/13/2008	99.85%	1/14/2008 - 6/29/2009	99.12%	6/30/2009 - 1/31/2010	99.53%
	2000004			12/19/2006 - 8/27/2007	50.00%	8/28/2007 - 1/13/2008	97.50%	1/14/2008 - 7/7/2009	98.01%	7/8/2009 - 1/31/2010	100%
	2000005/ 2000006			12/19/2006 - 9/9/2007	50.00%	9/10/2007 - 1/13/2008	94.08%	1/14/2008 - 7/1/2009	99.85%	7/2/2009 - 1/31/2010	99.69%

Table B.5. Flare Efficiency (ID4)

Site ID	Date of FE Test	Test Results	Date of FE Test	Test Results	Date of FE Test	Test Results
1335631	8/29/2007	99.85%	1/14/2008	99.12%	6/30/2009	99.53%
2000004	8/28/2007	97.50%	1/14/2008	98.01%	7/8/2009	100.00%
2000005/ 2000006	9/10/2007	94.08%	1/14/2008	99.85%	7/2/2009	99.69%

Table B.6. Flare Efficiency Test Dates

B.7. QA/QC measures applied

B.7.1. QA/QC roles and responsibilities

Complete work instructions and QA/QC roles and responsibilities are listed in the O&M plan. Below is a summary of QA/QC responsibilities and documentation applied for the monitored parameters:

Parameter	Documentation	Performed by	QA/QC check performed by:
Biogas Produced	Monthly Report	RMT	QA, OP
CO2 produced	Reported on Monthly Report; taken quarterly	RMT	QA,OP
Operational Status	Weekly Report	FH, RMT	QA, OP
Flare Efficiency	Flare Efficiency	RMT	QA, OP

FH-Farm Hand, RMT - Regional maintenance technician; QA - quality assurance; OP – operations

B.8. Calibration Records

All calibration certificates for Roots meters installed at the sites were provided to the DOE. According to the manufacturer, no calibration after correct installation is required. The flow meter type applied has a tendency to measure lower volumes if there are any operating problems, resulting in rather an underestimation of actual biogas flows. The LandTec Biogas Check gas analyzers are calibrated against bottled gas samples at every farm visited. Every 6 months they are sent back to the manufacturer for recalibration. Calibration records for gas analyzers were provided to the DOE for review and verification.

Section C Equations and calculation methods

C.1 Baseline calculation methods:

The baseline for this project activity is defined as the amount of methane that would be emitted to the atmosphere during the crediting period in the absence of the project activity. In this case, an open lagoon is considered the baseline unless otherwise noted.

C.2 Project Activity calculation methods:

The project emissions for this project activity are defined as the amount of methane that is emitted to the atmosphere during the crediting period due to the project activity. In this case, an anaerobic digester is considered the project activity.

C.3 Leakage calculation methods:

In accordance with the methodology, leakage calculations are not required.

C.4 Total emission reductions equations and calculation methods:

As stated in section D.3 of the registered PDD, emission reductions are determined by multiplying the biogas meter reading (ID1) by the percentage of methane in the biogas (ID2). This product is multiplied by the result of combustion equipment efficiency (ID3) times the flare efficiency (ID4) to determine emission reductions for the monitoring period.

Actual emission reductions are calculated as follows (see Table C.1 below for descriptions):

1) Avg. daily biogas = Cumulative biogas in monitoring period / # days in monitoring period
2) Biogas generated for each month = Avg. daily biogas * # of days in month
3) CH^4 volume = Biogas generated for each month * ((94 – CO^2) / 100) This includes the 6% trace gas deduction.
4) CH^4 density = 1/ (1.39403497+(0.005103551*Temp for each month))
5) kg CH^4 = CH^4 volume * CH^4 density
6) Monthly monitored emission reduction in tonnes of CO_2e = (Kg CH^4 * GWP)/ 1000

Table C.1. Variable Definitions

Variable	Value	Description
Avg. daily biogas	Calculated	m^3
Cumulative biogas in monitoring period	Measured	Based on the monthly biogas meter readings entered by Operations
Biogas generated for each month	Calculated	Normalized biogas volume for month
CH^4 volume	Calculated	Volume of methane (m^3)
CH^4 density	Calculated	Density of methane (kg/m^3)
kg CH^4	Calculated	Mass of methane

Section D Emission reductions

D.1 Emission reductions:

Table D.1 below presents emissions reductions calculated as specified in Section C.4. A reduction of 6% has been taken for all sites producing metered ERs in this PDD, as a result of the Request for Deviation for methane analysis. As per this request, methane was calculated using (100%-CO_2%)-6% = CH_4%. The resulting methane was used in the calculations to determine emission reductions per the PDD. Equipment outages which required an adjustment to emission reductions have been factored into the totals below. Two sites experienced outages of short duration which were factored into the emissions reductions, and removed from totals, as per procedures. Site specific information has been provided to and verified by the DOE.

D.1. Total Metered Project Emission Reductions				
			GHG Emissions (CO2e)	
No.	Site ID	Source	Metered Emission Reductions	Total Metered Emission Reductions With Flare Efficiency
1	1335631	Rancho El Tropezon	3,087	2,303
2	2000004	Granja Porcina El Cerrito Sitio 1	5,116	4,341
3	2000005/ 2000006	Granja Porcina Guadalupe Sitio II / Granja Porcina Guadelupe Sitio III	14,090	11,781
			Total:	**18,425**

E. Comparison of actual ERs to PDD estimated ERs

E.1 Emission reduction estimated for this monitoring period

Source	Dates		ERs
	From	To	
Registered PDD Estimate	19 Dec 2006	31 Jan 2010	40,037

E.2 Emission reduction actually achieved during this monitoring period

Source	Dates		ERs
	From	To	
Actual emission reductions claimed during this monitoring period	19 Dec 2006	31 Jan 2010	18,425

E.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.