CLEAN DEVELOPMENT MECHANISM

LOMA LOS COLORADOS LANDFILL GAS PROJECT

MONITORING REPORT N° 2 Version 1

PERIOD: 18/06/2007 - 12/03/2008

DATE: 01/04/2008

		
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Landfill Gas System Supervisor	Loma Los Colorados Landfill Chief Enginer	KDM Landfill Manager

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SECTION A. GENERAL PROJECT ACTIVITY INFORMATION

A.1 Title of the project activity

Loma Los Colorados Landfill Gas Project

A.2 CDM registration number:

Registration project N° UNFCCC 00000822 CDMP

A.3 Short description of the project activity

The Loma Los Colorados Landfill Gas Project aims to develop and operate a landfill gas collection and flaring system (SCAB[1]). Landfill gas flaring destroys the methane present on the gas, in order to reduce green house gas (GHG) emissions. Part of the collected landfill gas will be used, in the future, on energy generation for the landfill activities supply. Additional GHG emissions reductions could be claimed by fosil fuel replacement within the context of this CDM project.

Loma Los Colorados is a Municipal Solid Waste (MSW) landfill located in the community of Til-Til, 63,5 km north of Santiago, Chile, near the village of Montenegro. Site operations are handled by KDM. Because of the technology used and the operational procedures, the landfill operation is considered one of the most moderns in Chile.

Currently,180 landfill gas wells are installed over a 48,5 hectares area; of which 180 are connected to the flare station, through an active gas extraction system.

According to the registered CDM project, the predicted LFG recovery rate for the Landfill, within 2008 is about 7.600 m^3/h (assuming 50% capture of LFG generated). The overall predicted recovery rate will continue to increase until the landfill closes, which is anticipated to occur in 2045, after which the rate will decrease as the organic fraction is degraded.

A.4 Monitoring period

From: 18-06-2007 To: 12-03-2008.

[1] SCAB: by the initials in Spanish: Sistema de Captación y Abatimiento de Biogás (Biogas capture and flaring system)

The official start up and data registration was 17-03-2007. before this date, the plant was in commissioning.

A.5 Methodology applied to the project activity

A.5.1 Baseline methodology

Approved consolidated baseline methodology ACM0001, version 4, 28 July 2006: "Consolidated baseline methodology for landfill gas project activities".

For emissions reduction associated with electricity generation using landfill gas ACM0001 also incorporates ACM0002 "Consolidated Baseline Methodology for Grid-Connected Power Generation from Renewable Sources." and, for power generation below 15 MW, small-scale CDM methodology AMS I.D. For this PDD, was used the ACM0002, version 6.

A.5.2 Monitoring methodology

Approved Consolidated monitoring methodology ACM0001: "Consolidated monitoring methodology for landfill gas project activities", version 4, 28 July 2006. Since the project involves possible energy use of landfill gas collected. The ACM0002 "Consolidated Methodology for Grid-Connected Power Generation from Renewable" has also being used.

A.6 Implementation status

To include: Complete schedule, commission date, major revisions and changes, etc.

Event	System size	Date
Construction (wells drilling, pipeline construction)	15 wells	29-12-2007
Construction (shallow wells and pipe lines)	56	28-02-2008
Operating wells	180	12-03-2008

A.7 Intended deviations or revisions to the registred PDD:

There are no intended deviations or revisions to the registred PDD

A.10 Person(s) responsible for the submission of the monitoring report

The persons responsible for the submission of the monitoring report are:

- Prepared by: Camilo Silva M. – Landfill Gas System Supervisor
- Revised by: Sergio Garcia D. – Loma Los Colorados Landfill Chief Engineer
- Approved by: Sergio Durandeau S. - KDM Landfill Manager

SECTION B. KEY MONITORING ACTIVITIES

B.1 Monitoring equipment

B.1.2. Equipment used

Equipment	Serial Number	Last calibration	Next calibration
Gas analyzer SIEMENS	U6-477	03-03-2008	03-03-2009
Thermal Mass Flow Meter 1 (i)	268935	18-07-2006	18-01-2008 (Sent to calibration)
Thermal Mass Flow Meter 2 (i)	278712	16-05-2007	16-11-2008
Thermal Mass Flow Meter 3 (i)	285359	28-11-2007	28-05-2009
Gas analyzer GEM 2000 Plus (ii)	GM08685	17-04-2007	17-10-2007 (Sent to calibration)
Gas analyzer GEM 2000 Plus (ii)	GM08587	10-12-2007	10-06-2008
Flare Stack Thermocouple	ETCA20W241K	----------	----------
Blower 1	PMP -110A	----------	----------
Blower 2	PMP -110B	----------	----------
Blower 3	PMP -110C	----------	----------

VDF 1	SIC-110A	----------	----------
VDF 2	SIC-110B	----------	----------
VDF 3	SIC-110C	----------	----------
Manifold Thermocouple	8303A704254	----------	----------
Pressure sensor	JEJABA064	----------	----------
Energy recorder 1	02B0629	----------	----------
Energy recorder 2	02B0637	----------	----------

(i) Thermal mass flow meter measurements don't use pressure and temperature data from others instruments to calculate the standard flow, according clarification ACM0001 version 2.

(ii) GEM 2000 plus is a portable gas analyzer, used to analyze the biogas quality in gas wells.

B.1.3. Calibration procedures

Calibrations are performed by independent, external accredited laboratories, or by the instruments manufactures, if applies.

Gas analyzers (GEM-) are periodically adjusted by trained KDM employees, with a certificated patron gas, if necessary.

Calibration procedures and schedules are described on the Integrated Management System document SGI-GRL-P-009, M-007 SCAB, M-008 SCAB and M-009 SCAB.

B.1.4 Involvement of third Parties:

SCAB has two third parties involved:

a) Specialized company on gas analysis AIRON, which is certified by national authorities. AIRON made the analysis of the concentrations of methane in exhaust gas

b) Tunning is a software development company, in charge of the automatic control system development and implementation.

B.2. Data collection

B.2.1. Default fixed values

Density of methane:	0,000716 (i) t/m^3
Methane Global Warming Potential	21 ton CO_{2e}/t CH_4
Electricity Emission Factor	0,608 (i) tCO_{2e}/MWh
Fuel Oil Consumption Emission Factor	74,1(ii) tCO_{2e}/TJ
Fuel Oil density	0,85 kg/l
Fuel Oil calorific power	45.891,5 kj/kg
Gas Consumption Emission Factor	63,1 (ii) tCO_{2e}/TJ
GLP calorific power	47.720 kj/kg
Base line	245 tCH_4/year

(i) Loma los Colorados Landfill Gas PDD considers a density for Methane of 0,0007168 t/m^3. AMC0001 states a lower density (0,000716 t/m^3). In order to keep a conservative approach, calculations were made using the Methodology value..

(ii) According to 2006 IPCC Guidelines for National Greenhouse Gas Inventories

B.2.2. Variables and units

Landfill Gas Flow	SCMH
Methane	%
Flare Temperature	°C
Flare efficiency	%
Electricity consumption	MW
Fuel oil consumption	TJ
Pilot gas consumption	TJ

B.2.3 Data concerning GHG emissions by sources of the project activity referring to paragraph (53 a)):

See item D.3.1.

B.2.4 Data concerning GHG emissions by sources of the baseline (referring to paragraph (53b)):

Table of dates.

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
18-06-2007	72.085	52,9	38.132	72.085	3,8	38.132	805	99,9885	38.127	0	0	0
19-06-2007	73.833	53,8	39.722	73.833	3,8	39.722	805	99,9885	39.717	0	0	0
20-06-2007	74.925	53,9	40.384	74.925	3,8	40.384	808	99,9885	40.379	0	0	0
21-06-2007	75.492	53,9	40.690	75.492	3,8	40.690	810	99,9885	40.685	0	0	0
22-06-2007	74.774	54,0	40.377	74.774	3,8	40.377	808	99,9885	40.372	0	0	0
23-06-2007	78.260	53,6	41.947	78.260	3,8	41.947	805	99,9885	41.942	0	0	0
24-06-2007	75.400	53,2	40.112	75.400	3,8	40.112	805	99,9885	40.107	0	0	0
25-06-2007	75.534	53,1	40.108	75.534	3,8	40.108	805	99,9885	40.103	0	0	0
26-06-2007	78.906	53,0	41.820	78.906	3,8	41.820	807	99,9885	41.815	0	0	0
27-06-2007	79.957	53,4	42.697	79.957	3,8	42.697	810	99,9885	42.692	0	0	0
28-06-2007	79.430	53,4	42.415	79.430	3,8	42.415	810	99,9885	42.410	0	0	0
29-06-2007	79.330	53,3	42.282	79.330	3,8	42.282	810	99,9885	42.277	0	0	0
30-06-2007	80.049	53,3	42.666	80.049	3,8	42.666	810	99,9885	42.661	0	0	0
01-07-2007	80.088	53,6	42.927	80.088	3,8	42.927	810	99,9885	42.922	0	0	0
02-07-2007	80.095	53,5	42.850	80.095	3,8	42.850	810	99,9885	42.845	0	0	0
03-07-2007	78.664	53,8	42.321	78.664	3,8	42.321	813	99,9885	42.316	0	0	0
04-07-2007	80.326	53,5	42.974	80.326	3,8	42.974	818	99,9885	42.969	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
05-07-2007	80.759	54,1	43.690	80.759	3,8	43.690	821	99,9885	43.684	0	0	0
06-07-2007	81.436	54,6	44.464	81.436	3,8	44.464	823	99,9885	44.458	0	0	0
07-07-2007	80.711	55,0	44.391	80.711	3,8	44.391	823	99,9885	44.385	0	0	0
08-07-2007	79.734	55,1	43.933	79.734	3,8	43.933	823	99,9885	43.927	0	0	0
09-07-2007	71.222	55,6	39.599	71.222	3,8	39.599	821	99,9885	39.594	0	0	0
10-07-2007	78.444	55,3	43.379	78.444	3,8	43.379	823	99,9885	43.374	0	0	0
11-07-2007	79.663	54,2	43.177	79.663	3,8	43.177	823	99,9885	43.172	0	0	0
12-07-2007	81.895	53,4	43.731	81.895	3,8	43.731	823	99,9885	43.725	0	0	0
13-07-2007	82.602	53,1	43.861	82.602	3,8	43.861	823	99,9885	43.855	0	0	0
14-07-2007	81.527	53,2	43.372	81.527	3,8	43.372	823	99,9885	43.367	0	0	0
15-07-2007	80.939	53,0	42.897	80.939	3,8	42.897	823	99,9885	42.892	0	0	0
16-07-2007	80.543	53,0	42.687	80.543	3,8	42.687	823	99,9885	42.682	0	0	0
17-07-2007	79.807	53,3	42.537	79.807	3,8	42.537	823	99,9885	42.532	0	0	0
18-07-2007	81.352	53,6	43.604	81.352	3,8	43.604	824	99,9885	43.598	0	0	0
19-07-2007	81.593	53,4	43.570	81.593	3,8	43.570	828	99,9885	43.564	0	0	0
20-07-2007	81.523	53,4	43.533	81.523	3,8	43.533	828	99,9885	43.527	0	0	0
21-07-2007	82.932	53,0	43.953	82.932	3,8	43.953	828	99,9885	43.947	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
22-07-2007	82.424	53,0	43.684	82.424	3,8	43.684	828	99,9885	43.678	0	0	0
23-07-2007	81.697	53,0	43.299	81.697	3,8	43.299	828	99,9885	43.294	0	0	0
24-07-2007	77.469	53,5	41.445	77.469	3,8	41.445	856	99,9885	41.440	0	0	0
25-07-2007	81.304	53,0	43.091	81.304	3,8	43.091	884	99,9885	43.086	0	0	0
26-07-2007	81.017	53,3	43.182	81.017	3,8	43.182	873	99,9885	43.177	0	0	0
27-07-2007	81.249	53,5	43.468	81.249	3,8	43.468	843	99,9885	43.463	0	0	0
28-07-2007	81.657	53,3	43.523	81.657	3,8	43.523	818	99,9885	43.517	0	0	0
29-07-2007	81.952	53,4	43.762	81.952	3,8	43.762	818	99,9885	43.756	0	0	0
30-07-2007	81.495	53,3	43.436	81.495	3,8	43.436	818	99,9885	43.431	0	0	0
31-07-2007	81.669	53,2	43.447	81.669	3,8	43.447	823	99,9885	43.442	0	0	0
01-08-2007	84.823	52,9	44.871	84.823	3,8	44.871	805	99,9885	44.865	0	0	0
02-08-2007	83.967	52,8	44.334	83.967	3,8	44.334	801	99,9885	44.328	0	0	0
03-08-2007	84.208	52,9	44.546	84.208	3,8	44.546	805	99,9885	44.540	0	0	0
04-08-2007	84.325	53,2	44.860	84.325	3,8	44.860	798	99,9885	44.854	0	0	0
05-08-2007	83.785	52,9	44.322	83.785	3,8	44.322	798	99,9885	44.316	0	0	0
06-08-2007	83.515	52,9	44.179	83.515	3,8	44.179	798	99,9885	44.173	0	0	0
07-08-2007	80.727	52,9	42.704	80.727	3,8	42.704	798	99,9885	42.699	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
08-08-2007	81.187	51,9	42.136	81.187	3,8	42.136	798	99,9885	42.131	0	0	0
09-08-2007	83.152	51,8	43.072	83.152	3,8	43.072	798	99,9885	43.067	0	0	0
10-08-2007	81.093	51,5	41.762	81.093	3,8	41.762	798	99,9885	41.757	0	0	0
11-08-2007	82.726	51,0	42.190	82.726	3,8	42.190	798	99,9885	42.185	0	0	0
12-08-2007	82.666	50,4	41.663	82.666	3,8	41.663	798	99,9885	41.658	0	0	0
13-08-2007	81.017	51,3	41.561	81.017	3,8	41.561	798	99,9885	41.556	0	0	0
14-08-2007	82.284	52,1	42.869	82.284	3,8	42.869	798	99,9885	42.864	0	0	0
15-08-2007	85.361	52,3	44.643	85.361	3,8	44.643	807	99,9885	44.637	0	0	0
16-08-2007	76.535	52,7	40.333	76.535	3,8	40.333	808	99,9885	40.328	0	0	0
17-08-2007	83.489	52,5	43.831	83.489	3,8	43.831	808	99,9885	43.825	0	0	0
18-08-2007	86.694	51,5	44.647	86.694	3,8	44.647	808	99,9885	44.641	0	0	0
19-08-2007	87.105	50,8	44.249	87.105	3,8	44.249	808	99,9885	44.243	0	0	0
20-08-2007	86.166	51,1	44.030	86.166	3,8	44.030	808	99,9885	44.024	0	0	0
21-08-2007	84.310	51,3	43.251	84.310	3,8	43.251	808	99,9885	43.246	0	0	0
22-08-2007	85.424	51,2	43.737	85.424	3,8	43.737	808	99,9885	43.731	0	0	0
23-08-2007	87.430	51,1	44.676	87.430	3,8	44.676	808	99,9885	44.670	0	0	0
24-08-2007	88.287	51,0	45.026	88.287	3,8	45.026	808	99,9885	45.020	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
25-08-2007	88.081	50,9	44.833	88.081	3,8	44.833	808	99,9885	44.827	0	0	0
26-08-2007	88.610	50,8	45.013	88.610	3,8	45.013	808	99,9885	45.007	0	0	0
27-08-2007	88.094	51,2	45.104	88.094	3,8	45.104	808	99,9885	45.098	0	0	0
28-08-2007	83.268	51,9	43.216	83.268	3,8	43.216	808	99,9885	43.211	0	0	0
30-08-2007	78.883	52,3	41.255	78.883	3,8	41.255	808	99,9885	41.250	0	0	0
31-08-2007	79.679	52,1	41.512	79.679	3,8	41.512	808	99,9885	41.507	0	0	0
01-09-2007	78.446	52,3	41.027	78.446	3,8	41.027	808	99,9885	41.022	0	0	0
02-09-2007	79.711	52,0	41.449	79.711	3,8	41.449	808	99,9885	41.444	0	0	0
03-09-2007	80.637	51,1	41.205	80.637	3,8	41.205	808	99,9885	41.200	0	0	0
04-09-2007	84.860	50,1	42.514	84.860	3,8	42.514	808	99,9885	42.509	0	0	0
05-09-2007	87.682	49,8	43.665	87.682	3,8	43.665	808	99,9885	43.659	0	0	0
06-09-2007	87.845	49,9	43.834	87.845	3,8	43.834	808	99,9885	43.828	0	0	0
07-09-2007	87.268	51,0	44.506	87.268	3,8	44.506	808	99,9885	44.500	0	0	0
08-09-2007	87.292	51,1	44.606	87.292	3,8	44.606	808	99,9885	44.600	0	0	0
09-09-2007	86.809	51,0	44.272	86.809	3,8	44.272	808	99,9885	44.266	0	0	0
10-09-2007	86.334	51,2	44.203	86.334	3,8	44.203	808	99,9885	44.197	0	0	0
11-09-2007	84.578	51,6	43.642	84.578	3,8	43.642	820	99,9885	43.636	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
12-09-2007	73.354	51,7	37.924	73.354	3,8	37.924	794	99,9885	37.919	0	0	0
13-09-2007	89.141	50,5	45.016	89.141	3,8	45.016	728	99,9885	45.010	0	0	0
14-09-2007	87.773	50,1	43.974	87.773	3,8	43.974	728	99,9885	43.968	0	0	0
15-09-2007	89.644	50,5	45.270	89.644	3,8	45.270	728	99,9885	45.264	0	0	0
16-09-2007	89.626	50,7	45.440	89.626	3,8	45.440	728	99,9885	45.434	0	0	0
17-09-2007	89.355	50,4	45.034	89.355	3,8	45.034	728	99,9885	45.028	0	0	0
18-09-2007	88.563	50,5	44.724	88.563	3,8	44.724	728	99,9885	44.718	0	0	0
19-09-2007	87.482	50,5	44.178	87.482	3,8	44.178	728	99,9885	44.172	0	0	0
20-09-2007	88.318	50,7	44.777	88.318	3,8	44.777	728	99,9885	44.771	0	0	0
21-09-2007	90.202	50,6	45.642	90.202	3,8	45.642	728	99,9885	45.636	0	0	0
22-09-2007	92.234	49,9	46.024	92.234	3,8	46.024	728	99,9885	46.018	0	0	0
23-09-2007	87.734	49,2	43.165	87.734	3,8	43.165	728	99,9885	43.160	0	0	0
24-09-2007	84.590	49,2	41.618	84.590	3,8	41.618	728	99,9885	41.613	0	0	0
25-09-2007	93.627	49,0	45.877	93.627	3,8	45.877	728	99,9885	45.871	0	0	0
26-09-2007	89.909	49,0	44.055	89.909	3,8	44.055	728	99,9885	44.049	0	0	0
27-09-2007	94.485	49,0	46.297	94.485	3,8	46.297	728	99,9885	46.291	0	0	0
28-09-2007	93.376	49,0	45.754	93.376	3,8	45.754	728	99,9885	45.748	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
29-09-2007	94.030	49,0	46.074	94.030	3,8	46.074	728	99,9885	46.068	0	0	0
30-09-2007	89.676	49,0	43.941	89.676	3,8	43.941	728	99,9885	43.935	0	0	0
01-10-2007	91.599	49,0	44.883	91.599	3,8	44.883	728	99,9885	44.877	0	0	0
02-10-2007	94.961	49,0	46.530	94.961	3,8	46.530	728	99,9885	46.524	0	0	0
03-10-2007	90.722	49,9	45.270	90.722	3,8	45.270	728	99,9885	45.264	0	0	0
04-10-2007	98.456	50,0	49.228	98.456	3,8	49.228	728	99,9885	49.222	0	0	0
05-10-2007	98.678	49,8	49.141	98.678	3,8	49.141	728	99,9885	49.135	0	0	0
06-10-2007	97.327	49,9	48.566	97.327	3,8	48.566	728	99,9885	48.560	0	0	0
07-10-2007	95.651	49,8	47.634	95.651	3,8	47.634	727	99,9885	47.628	0	0	0
08-10-2007	95.821	50,1	48.006	95.821	3,8	48.006	728	99,9885	48.000	0	0	0
09-10-2007	95.623	50,6	48.385	95.623	3,8	48.385	728	99,9885	48.379	0	0	0
10-10-2007	92.921	51,1	47.482	92.921	3,8	47.482	728	99,9885	47.476	0	0	0
11-10-2007	99.603	50,7	50.498	99.603	3,8	50.498	728	99,9885	50.492	0	0	0
12-10-2007	98.326	50,9	50.047	98.326	3,8	50.047	728	99,9885	50.041	0	0	0
13-10-2007	97.113	50,8	49.333	97.113	3,8	49.333	728	99,9885	49.327	0	0	0
14-10-2007	95.904	50,9	48.815	95.904	3,8	48.815	728	99,9885	48.809	0	0	0
15-10-2007	95.244	50,7	48.288	95.244	3,8	48.288	728	99,9885	48.282	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
16-10-2007	87.668	50,5	44.272	87.668	3,8	44.272	783	99,9885	44.266	0	0	0
17-10-2007	94.203	49,8	46.913	94.203	3,8	46.913	728	99,9885	46.907	0	0	0
18-10-2007	91.895	50,2	46.131	91.895	3,8	46.131	728	99,9885	46.125	0	0	0
19-10-2007	99.573	49,7	49.487	99.573	3,8	49.487	728	99,9885	49.481	0	0	0
20-10-2007	99.663	50,0	49.831	99.663	3,8	49.831	728	99,9885	49.825	0	0	0
21-10-2007	98.625	50,0	49.312	98.625	3,8	49.312	728	99,9885	49.306	0	0	0
22-10-2007	97.607	50,0	48.803	97.607	3,8	48.803	728	99,9885	48.797	0	0	0
23-10-2007	97.759	50,3	49.172	97.759	3,8	49.172	728	99,9885	49.166	0	0	0
24-10-2007	98.218	50,8	49.894	98.218	3,8	49.894	730	99,9885	49.888	0	0	0
25-10-2007	101.221	50,4	51.015	101.221	3,8	51.015	732	99,9885	51.009	0	0	0
26-10-2007	101.240	50,2	50.822	101.240	3,8	50.822	732	99,9885	50.816	0	0	0
27-10-2007	100.114	50,2	50.257	100.114	3,8	50.257	732	99,9885	50.251	0	0	0
28-10-2007	99.044	50,2	49.720	99.044	3,8	49.720	733	99,9885	49.714	0	0	0
29-10-2007	98.767	49,8	49.185	98.767	3,8	49.185	733	99,9885	49.179	0	0	0
30-10-2007	99.099	49,8	49.351	99.099	3,8	49.351	713	99,9885	49.345	0	0	0
31-10-2007	100.239	49,6	49.718	100.239	3,8	49.718	710	99,9885	49.712	0	0	0
01-11-2007	100.581	49,6	49.888	100.581	3,8	49.888	728	99,9885	49.882	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
02-11-2007	101.124	49,4	49.955	101.124	3,8	49.955	728	99,9885	49.949	0	0	0
03-11-2007	100.454	49,3	49.523	100.454	3,8	49.523	728	99,9885	49.517	0	0	0
04-11-2007	80.196	50,4	40.418	80.196	3,8	40.418	734	99,9885	40.413	0	0	0
05-11-2007	98.925	49,3	48.770	98.925	3,8	48.770	738	99,9885	48.764	0	0	0
06-11-2007	94.804	50,0	47.402	94.804	3,8	47.402	738	99,9885	47.396	0	0	0
07-11-2007	97.862	49,7	48.637	97.862	3,8	48.637	737	99,9885	48.631	0	0	0
08-11-2007	98.086	49,7	48.748	98.086	3,8	48.748	738	99,9885	48.742	0	0	0
09-11-2007	97.671	49,2	48.054	97.671	3,8	48.054	738	99,9885	48.048	0	0	0
10-11-2007	96.701	49,1	47.480	96.701	3,8	47.480	738	99,9885	47.474	0	0	0
11-11-2007	95.733	49,0	46.909	95.733	3,8	46.909	738	99,9885	46.903	0	0	0
12-11-2007	95.238	49,2	46.857	95.238	3,8	46.857	737	99,9885	46.851	0	0	0
13-11-2007	92.578	49,7	46.011	92.578	3,8	46.011	737	99,9885	46.005	0	0	0
14-11-2007	93.795	49,2	46.147	93.795	3,8	46.147	737	99,9885	46.141	0	0	0
15-11-2007	95.918	49,6	47.575	95.918	3,8	47.575	737	99,9885	47.569	0	0	0
16-11-2007	93.557	48,8	45.655	93.557	3,8	45.655	737	99,9885	45.649	0	0	0
17-11-2007	92.255	50,2	46.312	92.255	3,8	46.312	737	99,9885	46.306	0	0	0
18-11-2007	92.151	49,3	45.430	92.151	3,8	45.430	737	99,9885	45.424	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
19-11-2007	92.076	49,7	45.761	92.076	3,8	45.761	737	99,9885	45.755	0	0	0
20-11-2007	86.467	50,5	43.665	86.467	3,8	43.665	738	99,9885	43.659	0	0	0
21-11-2007	97.626	48,5	47.348	97.626	3,8	47.348	738	99,9885	47.342	0	0	0
22-11-2007	94.309	50,7	47.814	94.309	3,8	47.814	734	99,9885	47.808	0	0	0
23-11-2007	98.477	50,1	49.336	98.477	3,8	49.336	713	99,9885	49.330	0	0	0
24-11-2007	99.836	50,4	50.317	99.836	3,8	50.317	712	99,9885	50.311	0	0	0
25-11-2007	100.919	49,6	50.055	100.919	3,8	50.055	712	99,9885	50.049	0	0	0
26-11-2007	101.677	49,9	50.736	101.677	3,8	50.736	712	99,9885	50.730	0	0	0
27-11-2007	102.322	50,2	51.365	102.322	3,8	51.365	712	99,9885	51.359	0	0	0
28-11-2007	102.367	50,5	51.695	102.367	3,8	51.695	712	99,9885	51.689	0	0	0
29-11-2007	101.382	51,2	51.907	101.382	3,8	51.907	712	99,9885	51.901	0	0	0
30-11-2007	102.272	51,3	52.465	102.272	3,8	52.465	712	99,9885	52.458	0	0	0
01-12-2007	101.148	51,1	51.686	101.148	3,8	51.686	712	99,9885	51.680	0	0	0
02-12-2007	100.128	50,9	50.965	100.128	3,8	50.965	713	99,9885	50.959	0	0	0
03-12-2007	100.888	50,8	51.251	100.888	3,8	51.251	712	99,9885	51.245	0	0	0
04-12-2007	101.614	51,1	51.924	101.614	3,8	51.924	713	99,9885	51.918	0	0	0
05-12-2007	101.892	51,3	52.270	101.892	3,8	52.270	713	99,9885	52.263	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
06-12-2007	103.571	51,9	53.753	103.571	3,8	53.753	715	99,9885	53.746	0	0	0
07-12-2007	104.465	52,2	54.530	104.465	3,8	54.530	713	99,9885	54.523	0	0	0
08-12-2007	104.280	51,6	53.808	104.280	3,8	53.808	713	99,9885	53.801	0	0	0
09-12-2007	104.702	51,1	53.502	104.702	3,8	53.502	712	99,9885	53.495	0	0	0
10-12-2007	105.425	50,9	53.661	105.425	3,8	53.661	713	99,9885	53.654	0	0	0
11-12-2007	69.088	50,9	35.165	69.088	3,8	35.165	713	99,9885	35.160	0	0	0
12-12-2007	106.847	50,9	54.385	106.847	3,8	54.385	715	99,9885	54.378	0	0	0
13-12-2007	105.522	51,5	54.343	105.522	3,8	54.343	713	99,9885	54.336	0	0	0
14-12-2007	106.874	50,9	54.398	106.874	3,8	54.398	714	99,9885	54.391	0	0	0
15-12-2007	106.244	50,8	53.971	106.244	3,8	53.971	713	99,9885	53.964	0	0	0
16-12-2007	105.482	50,9	53.690	105.482	3,8	53.690	712	99,9885	53.683	0	0	0
17-12-2007	105.938	50,4	53.392	105.938	3,8	53.392	713	99,9885	53.385	0	0	0
18-12-2007	90.426	51,7	46.750	90.426	3,8	46.750	727	99,9885	46.744	0	0	0
19-12-2007	103.682	50,7	52.566	103.682	3,8	52.566	728	99,9885	52.559	0	0	0
20-12-2007	103.235	50,6	52.236	103.235	3,8	52.236	728	99,9885	52.229	0	0	0
21-12-2007	104.290	50,7	52.875	104.290	3,8	52.875	728	99,9885	52.868	0	0	0
22-12-2007	104.663	51,1	53.482	104.663	3,8	53.482	728	99,9885	53.475	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
23-12-2007	104.738	50,9	53.311	104.738	3,8	53.311	728	99,9885	53.304	0	0	0
24-12-2007	103.968	51,0	53.023	103.968	3,8	53.023	729	99,9885	53.016	0	0	0
25-12-2007	104.473	51,2	53.490	104.473	3,8	53.490	728	99,9885	53.483	0	0	0
26-12-2007	103.021	50,9	52.437	103.021	3,8	52.437	728	99,9885	52.430	0	0	0
27-12-2007	102.447	51,2	52.452	102.447	3,8	52.452	728	99,9885	52.445	0	0	0
28-12-2007	101.662	50,4	51.237	101.662	3,8	51.237	729	99,9885	51.231	0	0	0
29-12-2007	101.490	50,7	51.455	101.490	3,8	51.455	728	99,9885	51.449	0	0	0
30-12-2007	99.781	50,6	50.489	99.781	3,8	50.489	728	99,9885	50.483	0	0	0
31-12-2007	98.202	50,4	49.493	98.202	3,8	49.493	728	99,9885	49.487	0	0	0
01-01-2008	95.652	50,7	48.495	95.652	3,8	48.495	728	99,9885	48.489	0	0	0
02-01-2008	101.258	50,4	51.034	101.258	3,8	51.034	728	99,9885	51.028	0	0	0
03-01-2008	101.159	51,2	51.793	101.159	3,8	51.793	728	99,9885	51.787	0	0	0
04-01-2008	101.190	50,8	51.404	101.190	3,8	51.404	729	99,9885	51.398	0	0	0
05-01-2008	102.869	50,4	51.845	102.869	3,8	51.845	729	99,9885	51.839	0	0	0
06-01-2008	102.626	50,3	51.620	102.626	3,8	51.620	728	99,9885	51.614	0	0	0
07-01-2008	94.448	50,2	47.412	94.448	3,8	47.412	728	99,9885	47.406	0	0	0
08-01-2008	105.702	51,0	53.908	105.702	3,8	53.908	731	99,9885	53.901	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
09-01-2008	109.794	50,3	55.226	109.794	3,8	55.226	728	99,9885	55.219	0	0	0
10-01-2008	104.624	50,3	52.625	104.624	3,8	52.625	730	99,9885	52.618	0	0	0
11-01-2008	100.119	50,3	50.359	100.119	3,8	50.359	737	99,9885	50.353	0	0	0
12-01-2008	101.809	50,1	51.006	101.809	3,8	51.006	780	99,9885	51.000	0	0	0
13-01-2008	100.374	48,8	48.982	100.374	3,8	48.982	758	99,9885	48.976	0	0	0
14-01-2008	101.103	48,5	49.034	101.103	3,8	49.034	758	99,9885	49.028	0	0	0
15-01-2008	100.919	48,1	48.542	100.919	3,8	48.542	759	99,9885	48.536	0	0	0
16-01-2008	97.511	48,3	47.097	97.511	3,8	47.097	758	99,9885	47.091	0	0	0
17-01-2008	100.617	48,9	49.201	100.617	3,8	49.201	758	99,9885	49.195	0	0	0
18-01-2008	100.653	49,0	49.319	100.653	3,8	49.319	758	99,9885	49.313	0	0	0
19-01-2008	100.066	49,4	49.432	100.066	3,8	49.432	758	99,9885	49.426	0	0	0
20-01-2008	99.494	48,9	48.652	99.494	3,8	48.652	758	99,9885	48.646	0	0	0
21-01-2008	99.781	48,9	48.792	99.781	3,8	48.792	758	99,9885	48.786	0	0	0
22-01-2008	100.466	48,7	48.926	100.466	3,8	48.926	758	99,9885	48.920	0	0	0
23-01-2008	97.536	48,3	47.109	97.536	3,8	47.109	758	99,9885	47.103	0	0	0
24-01-2008	97.846	48,2	47.161	97.846	3,8	47.161	758	99,9885	47.155	0	0	0
25-01-2008	96.724	48,4	46.814	96.724	3,8	46.814	758	99,9885	46.808	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
26-01-2008	98.350	47,9	47.109	98.350	3,8	47.109	758	99,9885	47.103	0	0	0
27-01-2008	95.651	47,8	45.721	95.651	3,8	45.721	758	99,9885	45.715	0	0	0
28-01-2008	94.652	48,2	45.622	94.652	3,8	45.622	758	99,9885	45.616	0	0	0
29-01-2008	96.248	48,5	46.680	96.248	3,8	46.680	757	99,9885	46.674	0	0	0
30-01-2008	94.576	48,4	45.774	94.576	3,8	45.774	758	99,9885	45.768	0	0	0
31-01-2008	89.594	47,8	42.825	89.594	3,8	42.825	757	99,9885	42.820	0	0	0
01-02-2008	86.224	48,3	41.646	86.224	3,8	41.646	755	99,9885	41.641	0	0	0
02-02-2008	86.265	48,6	41.924	86.265	3,8	41.924	758	99,9885	41.919	0	0	0
03-02-2008	84.413	48,6	41.024	84.413	3,8	41.024	758	99,9885	41.019	0	0	0
04-02-2008	89.072	49,0	43.645	89.072	3,8	43.645	758	99,9885	43.639	0	0	0
05-02-2008	95.993	48,5	46.556	95.993	3,8	46.556	758	99,9885	46.550	0	0	0
06-02-2008	94.276	48,1	45.346	94.276	3,8	45.346	758	99,9885	45.340	0	0	0
07-02-2008	93.270	47,9	44.676	93.270	3,8	44.676	758	99,9885	44.670	0	0	0
08-02-2008	89.829	47,8	42.938	89.829	3,8	42.938	758	99,9885	42.933	0	0	0
09-02-2008	93.700	47,5	44.507	93.700	3,8	44.507	758	99,9885	44.501	0	0	0
10-02-2008	91.691	47,3	43.369	91.691	3,8	43.369	758	99,9885	43.364	0	0	0
11-02-2008	91.064	47,3	43.073	91.064	3,8	43.073	758	99,9885	43.068	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
12-02-2008	94.155	48,1	45.288	94.155	3,8	45.288	758	99,9885	45.282	0	0	0
13-02-2008	29.054	49,8	14.468	29.054	3,8	14.468	759	99,9885	14.466	0	0	0
14-02-2008	100.543	47,5	47.757	100.543	3,8	47.757	759	99,9885	47.751	0	0	0
15-02-2008	92.937	48,2	44.795	92.937	3,8	44.795	760	99,9885	44.789	0	0	0
16-02-2008	87.033	48,4	42.123	87.033	3,8	42.123	738	99,9885	42.118	0	0	0
17-02-2008	95.049	47,6	45.243	95.049	3,8	45.243	737	99,9885	45.237	0	0	0
18-02-2008	91.982	47,7	43.875	91.982	3,8	43.875	740	99,9885	43.869	0	0	0
19-02-2008	105.139	48,2	50.676	105.139	3,8	50.676	738	99,9885	50.670	0	0	0
20-02-2008	106.404	48,1	51.180	106.404	3,8	51.180	738	99,9885	51.174	0	0	0
21-02-2008	103.397	48,7	50.354	103.397	3,8	50.354	735	99,9885	50.348	0	0	0
22-02-2008	100.922	48,6	49.048	100.922	3,8	49.048	738	99,9885	49.042	0	0	0
23-02-2008	111.798	48,4	54.110	111.798	3,8	54.110	738	99,9885	54.103	0	0	0
24-02-2008	109.823	48,2	52.934	109.823	3,8	52.934	737	99,9885	52.927	0	0	0
25-02-2008	86.212	49,1	42.330	86.212	3,8	42.330	740	99,9885	42.325	0	0	0
26-02-2008	107.707	49,8	53.638	107.707	3,8	53.638	738	99,9885	53.631	0	0	0
27-02-2008	100.716	49,6	49.955	100.716	3,8	49.955	738	99,9885	49.949	0	0	0
28-02-2008	110.015	49,1	54.017	110.015	3,8	54.017	738	99,9885	54.010	0	0	0

	LFG	Methane	Methane	LFG Sent	Methane	Methane Sent	Temperature	Flare	Methane	Biogas to	Methane sent	Electricity
Time Stamp	Collected		Collected	To Flares	Exhaust Gas	To Flares	Process	Efficiency	Destroyed	electricity	To electricity	Exported
	(N,m3)	(%)	(N.m3)	(N.m3)	(ppm)	(N.m3)	(ºC)	(%)	(N.m3)	(N.m3)	(N.m3/day)	(MWh)
29-02-2008	94.994	49,7	47.212	94.994	3,8	47.212	742	99,9885	47.206	0	0	0
01-03-2008	110.949	48,5	53.810	110.949	3,8	53.810	739	99,9885	53.803	0	0	0
02-03-2008	108.667	48,0	52.160	108.667	3,8	52.160	738	99,9885	52.154	0	0	0
03-03-2008	90.924	49,2	44.734	90.924	3,8	44.734	747	99,9885	44.728	0	0	0
04-03-2008	108.534	48,5	52.638	108.534	3,8	52.638	743	99,9885	52.631	0	0	0
05-03-2008	76.343	48,2	36.797	76.343	3,8	36.797	738	99,9885	36.792	0	0	0
06-03-2008	78.500	55,5	43.567	78.500	3,8	43.567	739	99,9885	43.561	0	0	0
07-03-2008	88.535	53,6	47.454	88.535	3,8	47.454	739	99,9885	47.448	0	0	0
08-03-2008	65.138	53,5	34.848	65.138	3,8	34.848	739	99,9885	34.843	0	0	0
09-03-2008	105.384	49,8	52.481	105.384	3,8	52.481	747	99,9885	52.474	0	0	0
10-03-2008	97.498	48,9	47.676	97.498	3,8	47.676	750	99,9885	47.670	0	0	0
11-03-2008	97.467	49,1	47.856	97.467	3,8	47.856	750	99,9885	47.850	0	0	0
12-03-2008	94.139	49,5	46.598	94.139	3,8	46.598	739	99,9885	46.592	0	0	0
Totals	**24.626.830**	**50,6**	**12.455.330**	**24.626.830**	**3,8**	**12.455.330**	**760**	**99,9885**	**12.453.758**	**0**	**0**	**0**

B.2.5 Data concerning leakage (referring to paragraph (53 c)):

According with ACM0001- version 04 and the registered PDD, no leakage needs to be considered.

B.3 Data processing and archiving (incl. software used).

Data processing and archiving is done by an automatic control system.

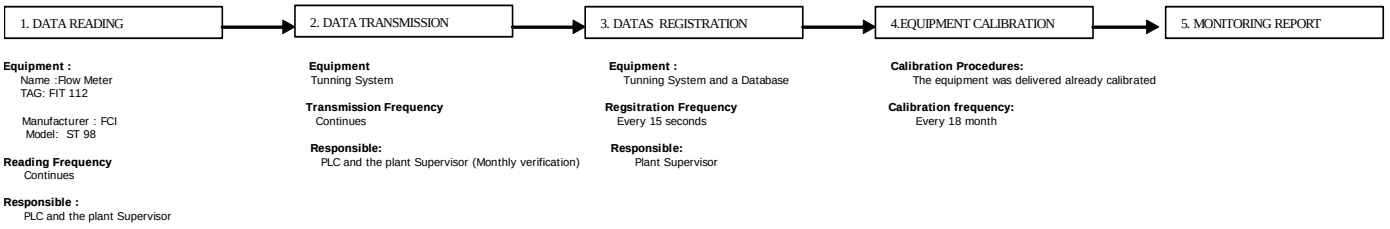
B.4 Special event log:

All the flare shoot downs are registered by the automatic control system, as required by the quality assurance system.

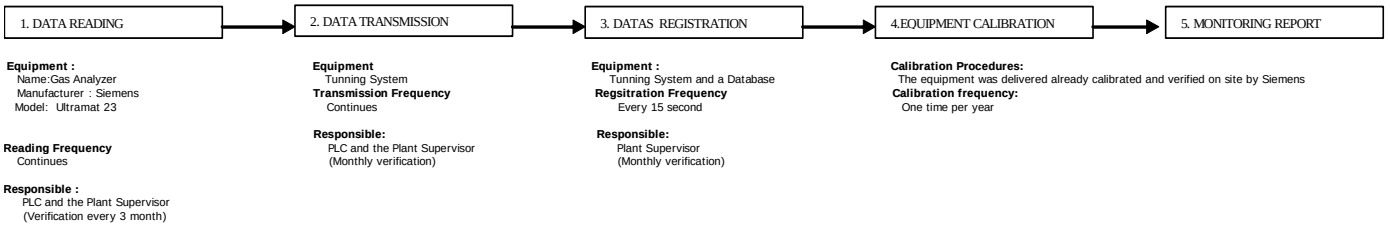
SECTION C. QUALITY ASSURANCE AND QUALITY CONTROL MEASURES.

C.1.1 Roles and responsibilities

Total Flow



Methane Concentration



C.1.2 Trainings

All training was supplied before project start up. The company has a training plan for the current year.

C.3 Internal audits and control measures:

This information is on A.6

SECTION D. CALCULATION OF GHG EMISSION REDUCTIONS

D.1. Table providing the used formulas

Methane

The GHG emission reduction associated with methane destruction achieved by the project activity during a given year "*y*" (ERM_y) is defined as: .

$$ERM_y = (MD_{project,y} - MD_{reg,y}) \cdot GWP_{CH_4} \quad (1)$$

Where:

ERM_y is measured in tones of CO_2 equivalent (tCO_{2e})

$MD_{project,y}$ and $MD_{reg,y}$ are measured in tones of methane (tCH_4)

GWP_{CH_4} = 21 tCO_{2e}/tCH_4

Since there are no legal requirements to capture and flare landfill gas in Chile, in recent years a small amount of landfill gas has been collected and flared at the project site. In order to be conservative, the three-year average (2002-2004) mass of methane captured and flared has being considered as baseline (245 tones methane per year)

The methane destroyed by the project activity ($MD_{project,y}$) during a year is determined by monitoring the quantity of methane actually flared or otherwise combusted for electricity generation:

$$MD_{project,y} = MD_{flared,y} + MD_{electricity,y} + MD_{sold,y} \quad (3)$$

MD electricity = 0

This project hasn't electricity generation during this period

MD sold = 0

This Project don't sell biogas for others uses or clients during this period.

$$MD_{flared,y} = LFG_{flare,y} \cdot w_{CH_4,y} \cdot D_{CH_4} \cdot FE \quad (4)$$

Where:

$MD_{flared,y}$ is the quantity of methane destroyed by flaring during the year, measured in cubic meters (m^3)

$LFG_{flared,y}$ is the quantity of landfill gas flared or during the year measured in cubic meters (m^3)

$w_{CH_4,y}$ is the average methane fraction of the landfill gas as measured during the year and expressed as a fraction (in m^3CH_4/m^3LFG)

FE is the flare efficiency (the fraction of the methane destroyed).

D_{CH_4} is the methane density expressed in tones of methane per cubic meter of methane (tCH_4/m^3CH_4).

For calculate the flare efficiency we propose the next formula based in a mass balance between methane inlet and methane in the exhaust gases.

(1)

$$FE = 1 - \frac{M_{nd,kg/h}}{MD_{flared,kg/h}}$$ This formula is according to EB 28 Annex13.

Where:

$MD_{flared,kg/h}$ is quantity of methane sent to flare in kg/hour (2)

$M_{nd,kg/h}$ is the quantity of methane non destroyed in kg/hour (3)

Flare efficiency

During this period was made two measures, for this flare efficiency calculation is used the measure with highest quantity of methane in the exhaust gas, in order to be more conservative.

$$MD_{flared,kg/h} = LFG_{flared,m^3/h} \cdot w_{CH\,4,day\_average} \cdot D_{CH_4} \cdot 1000 \frac{kg}{ton} \quad (2)$$

$MD_{flared,kg/h}$	$LFG_{flared,m^3/h}$	$w_{CH_4,day\_average}$	D_{CH_4}
1.210,282 kg/h	3.334 n,m^3/h	50, 7 %	0,000716 t/m^3

(3)

$M_{nd,kg/h}$
0,138 kg/h

Considering the above mentioned, flare efficiency is: (1)

FE
0,999885

D.2. Uncertainties and error propagation

Key variables are constantly measured by a flowmeter and a gas analyzer. Data is recorded every 15 seconds on the PLC and every 1 minute on the Data Recorder. Specifications for the measurement instruments are:

Variable	Instrument	Manufacturer	Model	Error (%)	
Methane concentration	Gas analyzer	Siemens	Ultramat 23	±1,0 %	α
Flow	Flow meter	FCI	ST-98-23CTO2BAOFA	± 1% reading+0,5% full scale	β

System uncertainty

System uncertainty (ε) is defined by the expression:

$$\varepsilon = \sqrt{(\alpha)^2 + (\beta)^2}\ (\%)$$

Where $\alpha = 1{,}0\ (\%)$ and $\beta = \frac{(0{,}01 \times \overline{Q} + 0{,}005 \times Q_{MAX})}{\overline{Q}} \bullet 100\ (\%)$.

$\overline{Q}$ is the average recorded flow, calculated with the records of the report period, and Q_{MAX} is the maximum flow reading for the instrument. In this case, Q_{MAX} = 5.097 m^3/h.

Instruments accuracies are provided by the SCAB supervisor, as inputs to the automatic control system, before the generation of each CO_{2e} report. When the accuracy is an absolute value (Gas Analyzer) the figure is kept on the system and is checked on the generation of every new report. When the accuracy is a

relative value (Flowmeter), the figure is tipped by the SCAB supervisor for every report generation, considering the average flow of the period.

Flow meter error

Period	hours	Flow m3/h	Q mean	error %	desviation
June	310,50	997.975,00	3.214,09	1,79	57,63
July	739,40	2.497.788,00	3.378,13	1,75	59,27
August	716,46	2.516.891,00	3.512,95	1,73	60,61
September	713,06	2.624.581,00	3.680,73	1,69	62,29
October	737,31	3.002.884,00	4.072,76	1,63	66,21
November	712,81	2.897.359,00	4.064,70	1,63	66,13
December	731,07	3.160.186,00	4.322,69	1,59	68,71
January	735,96	3.083.411,00	4.189,64	1,61	67,38
February	663,78	2.723.677,00	4.103,28	1,62	66,52
March	252,00	1.122.078,00	4.452,69	1,57	70,01

Average Flow of this period: 3.901,37 m^3/h

Average deviation of this period: 64,50 m^3/h

Flow meter error of this period: 1,65%

System error: $\varepsilon = \sqrt{(1)^2 + (1.95)^2}\,(\%) = 1{,}932\%$

In order to be conservative in our calculations of claimed CERs the system error is approached to 1.94%

Conservative System error: 1,94%

Significant figures

Significant figures correspond to each instrument precision.

Gas Analyzer significant figures are 3

Flow meter significant figures are 4

D.3. GHG emission reductions

D.3.1. Project emissions

The fuel oil consumed in the verification period is 11.889 liters or 10.105,65 kg.

Period		Fuel or Energy	Emission Factor	Quantity liters	Quantity Kg	Calorific power kj/kg	Energy Tj	Tons of CO_{2e}
18-06-2007	30-06-2007	Fuel oil	74,1 tCO_{2e}/TJ	628	533,8	45.891	0,0245	1,8152
01-07-2007	31-07-2007	Fuel oil	74,1 tCO_{2e}/TJ	1.529	1.299,65	45.891	0,0596	4,4195
01-08-2007	31-08-2007	Fuel oil	74,1 tCO_{2e}/TJ	1.294	1.099,9	45.891	0,0505	3,7402
01-09-2007	30-09-2007	Fuel oil	74,1 tCO_{2e}/TJ	1.160	986	45.891	0,0452	3,3529
01-10-2007	31-10-2007	Fuel oil	74,1 tCO_{2e}/TJ	1.116	948,6	45.891	0,0435	3,2257
01-11-2007	30-11-2007	Fuel oil	74,1 tCO_{2e}/TJ	2.397	2.037,45	45.891	0,0935	6,9284
01-12-2007	31-12-2007	Fuel oil	74,1 tCO_{2e}/TJ	1.268	1.077,8	45.891	0,0495	3,6651
01-01-2008	31-01-2008	Fuel oil	74,1 tCO_{2e}/TJ	1.204	1.023,4	45.891	0,0470	3,4801
01-02-2008	29-02-2008	Fuel oil	74,1 tCO_{2e}/TJ	1.293	1.099,05	45.891	0,0504	3,7373
01-03-2008	12-03-2008	Fuel oil	74,1 tCO_{2e}/TJ	528	448,8	45.891	0,0206	1,5262
Total				12.417	10.105,65		0,4844	35,8907

The Pilot gas consumed in the verification period is 45 kg.

The net MWh consumed in the verification period is 177,255 MWh

The project emissions during this period are:

Fuel or Energy	Emission Factor	Quantity	Calorific power kj/kg	Energy Tj	Tons of CO_{2e}
Fuel oil	74,1 tCO_{2e}/TJ	10.105,65 kg	45.891	0,4844	35,8907
Liquefied Petroleum Gases	63,1 tCO_{2e}/TJ	45 kg	47.720	0,0043	0,2710
Electricity	0,608 tCO_{2e}/MWh	177,255 MWh	----------	----------	107,7710
Total Project emission tCO_{2e}					**143,9330**

D.3.2. Baseline emissions

According to PDD the base line is 245 tCH_4 per year. This is equivalent to 14,0959 tCO_{2e} per day, over a 365 days year basis.

Total tCO_{2e} of this monitoring period: 3.777,6959 tCO_{2e}.

D.3.3 Leakage (L):

$L_{\text{monitoring period}} = 0$

D.3.4. Summary of the emissions reductions during the monitoring period

Period		Methane sent to flare	Methane burnt [tons]	Total tCO2e
18-06-2007	30-06-2007	533.352,0000	381,8800	8.019,4800
01-07-2007	31-07-2007	1.339.787,0000	959,2874	20.145,0354
01-08-2007	31-08-2007	1.304.425,0000	933,9683	19.613,3343
01-09-2007	30-09-2007	1.319.707,0000	944,9102	19.843,1142
01-10-2007	31-10-2007	1.505.989,0000	1.078,2881	22.644,0501
01-11-2007	30-11-2007	1.442.235,0000	1.032,6402	21.685,4442
01-12-2007	31-12-2007	1.611.990,0000	1.154,1848	24.237,8808
01-01-2008	31-01-2008	1.519.519,0000	1.087,9756	22.847,4876
01-02-2008	29-02-2008	1.317.707,0000	943,4782	19.813,0422
01-03-2008	12-03-2008	560.619,0000	401,4032	8.429,4672
Total				**187.278,3402**

The total tCO_{2e} claimed is:

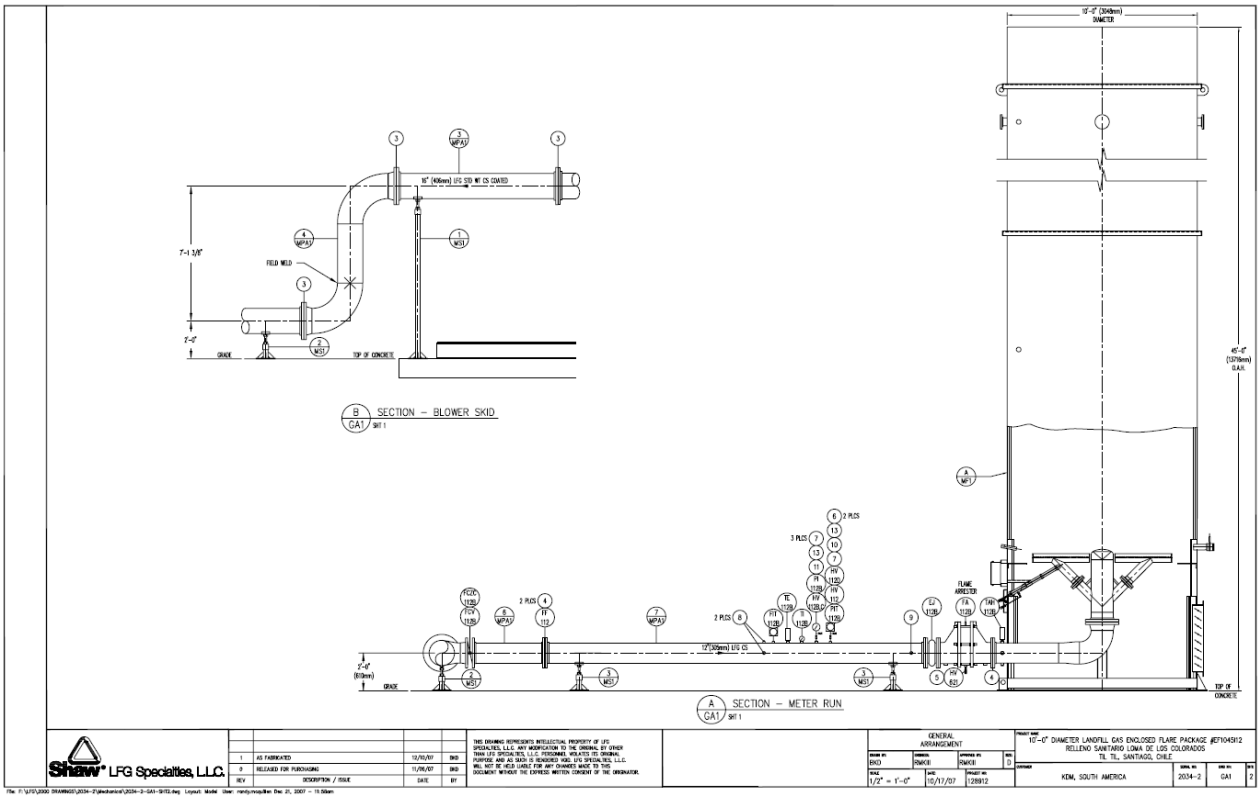
$$Total_{tCO_{2e}claimed} = [Total_{tCO_{2E}} \cdot Flare_{efficiency} \cdot (1 - System_{uncertainty})] - Project_{emission} - Base_{line}$$

Total tCO_{2e}	Flare efficiency	System uncertainty	Base line (tCO_{2e})	Project emission (tCO_{2e})	Total tCO_{2e} claimed
187.278,3402	99,9885%	1.94%	3.777,6959	143,9330	179.702,0000

Note: Comparison between PDD CER's estimation and CER's claimed

Estimation of total emission reduction for 2007 according to PDD: 381.163 tCO_{2e}

Total emission reductions claimed in this report: 179.702 tCO_{2e}


B
GA1
SECTION – BLOWER SKID
A
GA1
SECTION – METER RUN
Shaw LFG Specialties, LLC.
10'-0" DIAMETER LANDFILL GAS ENCLOSED FLARE PACKAGE JEF1045I2
RELLENO SANITARIO LOMA DE LOS COLORADOS
TIL TIL, SANTIAGO, CHILE
KDM, SOUTH AMERICA

EQUIPMENT / INSTRUMENT LEGEND

SERVICE	ITEM	QTY	DESCRIPTION	SUPPLIER	PART NO.	ADDITIONAL INFORMATION
LFG	EJ-100C	1	EXPANSION JOINT 12" X 12" X 8" LG SOA J1 BUNA W/ RINGS	LFG	VFJ12B	
LFG	FCV-100C	1	12" PNEUMATIC FLOW CONTROL VALVE W/ 3-WAY SOLENOID VALVE	LFG	VWB12CT-POC	
COMPRESSED AIR	FCZO-100C	1	POSITION SWITCH FCZO-100C OPEN SUPPLIED W/ FCV-100C			
COMPRESSED AIR	FCZC-100C	1	POSITION SWITCH FCZC-100C CLOSED SUPPLIED W/ FCV-100C			
LFG	CV-110C	1	CHECK VALVE 12" WAFER STYLE	LFG	VWC12CAB	
LFG	EJ-110C	1	EXPANSION JOINT 12" X 12" X 8" LG SOA J1 BUNA W/ RING	LFG	VFJ12B	
LFG	HV-110C	1	12" GEAR ACTUATED MANUAL BUTTERFLY VALVE	LFG	VWB12CB-G	
LFG	PMP-110C	1	LFG BLOWER	HSI	12603	3000 SCFM @ -60" W.C. INLET & 15" W.C. OUTLET, 75 H.P.
						3/50/380 TEFC MOTOR, DIRECT DRIVE, CW VERT DISCHARGE
LFG	SIC-110C	1	VARIABLE FREQUENCY DRIVE - PMP-100C	CUTLER HAMMER	SVX9000	
LFG	FCV-112B	1	12" MODULATING BUTTERFLY VALVE	LFG	SPECIAL	
COMPRESSED AIR	FCZC-112B	1	CLOSED LIMIT SWITCH (FOR FCV-112B)		SUPPPLIED W/ FCV-112	
LFG	FF-112B	1	GAS FLOW CONDITIONER	LFG	FLWSTRTNR12	
LFG	FIT-112B	1	GAS FLOW METER PROBE	FCI	ST-98	0 TO 3150 SCFM
LFG	HV-112	1	1/2" BALL VALVE SS THRD	LFG	PFV012S	
LFG	HV-112B,C,D	3	1/4" GAGE VALVE SS THRD	LFG	PFGV014S	0" TO 25" W.C., DUAL SCALE
LFG	PI-112B	1	FLOW RUN PRESSURE GAUGE	LFG	SPECIAL	0" TO 25" W.C.
LFG	PIT-112B	1	METER RUN PRESSURE TRANSMITTER	YOKOGAWA	EJA530A	4-20 mA
LFG	QIR-112B	1	FLOW RECORDER (REFERENCE ONLY)	YOKOGAWA	FX-112	0 TO 250° F, 6" LONG STEM
LFG	TE-112B	1	METER RUN TEMPERATURE - RTD W/ TRANSMITTER	PYROMATION	R1T185L383-006-	
					S6D0608-SL-6HN31	0° TO 250°F, DUAL SCALE
LFG	TI-112B	1	TEMPERATURE GAUGE SS 4" ALL ANGLE 6"	REOTEMP	MM-060-1-047	300 DEG. F
PROPANE	FCV-300B	1	PROPANE GAS SHUT-OFF SOLENOID VALVE	LFG	PFS012Y120VEXP	0 TO 15 PSIG
PROPANE	PI-300B	1	PROPANE GAS PRESSURE INDICATOR	LFG	PFG212PSI15	SET TO 3 PSIG
PROPANE	HV-300B	1	1/2" BALL VALVE	LFG	PFV012S	
PROPANE	FIL-300B	1	Y-STRAINER W/ 1/4" SQUARE PLUG	LFG	PFY012C	
PROPANE	PRV-300B	1	PROPANE GAS PRESSURE REGULATOR	LFG	PFD012B	
PROPANE	HV-301B	1	1/4" AIR COCK VALVE	LFG	PFV014AC	
COMPRESSED AIR	CV-510C	1	VALVE BALL CHECK BRASS 1/4"	LFG	PFV014ZC	S.P.=125 PSIG
COMPRESSED AIR	PBV-510C	1	PRESSURE RELIEF VALVE	LFG	POPOFF VALVE	
COMPRESSED AIR	HV-511C	1	NEEDLE VALVE	LFG	PFV014NZ	
CONDENSATE	CV-621C	1	VALVE SWING CHECK 1/2" SS	LFG	PFV012SSC	
CONDENSATE	HV-621C	1	1/2" BALL VALVE SS	LFG	PFV012S	

ALL COMPONENTS TO BE SHIPPED LOOSE

Shaw® LFG Specialties, L.L.C.

REV	DESCRIPTION / ISSUE	DATE	BY
1	AS FABRICATED	12/10/07	BKD
0	RELEASED FOR PURCHASING	11/06/07	BKD

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DRAWN BY:	CHECKED:	APPROVED BY:	SIZE:
BKD	RMKII	RMKII	D

SCALE	DATE:	PROJECT NO:
NONE	10/16/07	128912

PROJECT NAME: 10'-0" DIAMETER ENCLOSED FLARE PACKAGE #EF1045I12
RELLENO SANITARIO LOMA DE LOS COLORADOS
TIL TIL, SANTIAGO, CHILE

CUSTOMER	SERIAL NO.	DWG NO.	SHT.
KDM, SOUTH AMERICA	2034-2	PID	2

File: F:\LFG\2000 DRAWINGS\2034-2\Mechanical\2034-2-PID-SHT2.dwg Layout: Model User: randy.mcquillen Dec 21, 2007 - 11:52am