CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 01 - in effect as of: 1 July 2004)

CONTENTS

Annexes

SECTION A. General description of project activity

A.1 Title of the project activity:

Puente Gallego Landfill gas recovery project, Rosario, Argentina.
Version 1
20/08/2005

A.2. Description of the project activity:

The purpose of the project is to capture and burn biogas from the landfill site Puente Gallego, Rosario, Pcia Santa Fé, Argentina. This project will effect a reduction in Greenhouse Gas emissions through the combustion of methane contained in the biogas exploited from the landfill site.
Total avoided CO_2 emissions over a 10 year period are estimated at about 0,6 millions tons.
ASJA Ambiente Italia S.p.A.and IMPSA are companies working together as UTE Asja Ambiente Italia SpA – IMPSA, a 50/50 contractual joint venture.
UTE Asja Ambiente Italia SpA - IMPSA won the rights to exploit the biogas produced at the Puente Gallego landfill site through a competitive bid organized by Municipalidad de Rosario, a public entity.
UTE Asja Ambiente Italia SpA - IMPSA and Municipalidad de Rosario signed a concession contract in June 2005 in which Municipalidad de Rosario grants the rights to use all biogas produced at the Puente Gallego landfill for a 10-year period.
Throughout the duration of the contract, UTE Asja Ambiente Italia SpA - IMPSA will be responsible for the construction and management of the landfill gas extraction and flaring systems, including any required investment and Municipalidad de Rosario will continue to own and manage the landfill.
UTE Asja Ambiente Italia SpA - IMPSA will capture the biogas produced at the Puente Gallego landfill by setting up and operating an extraction plant comprised of a network of wells and connected pipes, running into blowers and then into torches to flare it.
As current laws in Argentina do not control the LFG combustion, this project will contribute to the sustainable development of the area immediately surrounding the landfill, Santa Fe Province and Argentina as a whole:

- Abatement of the CH_4 emissions from the landfill;
- The area immediately surrounding the landfill will see an immediate benefit in the elimination of odorous gas emissions coming from the landfill. Substantial reduction or elimination of these gases will mitigate the health problems that these gases can cause to the local population and will certainly have a positive impact on development potential of the area surrounding the landfill;
- Safe and effective extraction of the biogas produced by the landfill will also significantly reduce the risk of fire and explosion at the landfill;
- The project will have a small but positive impact on local economy, employing local workers and using local materials whenever possible;
- The Municipalidad de Rosario will benefit from technology and know-how transfer;
- Additional fundings will be received by Municipalidad de Rosario from the sale of carbon credits..

A.3. Project participants:

Name of Party Involved ((host) indicates an host Party)	Private and/or public entity(ies) project partecipants	Kindly indicate if the Party involved wishes to be considered as project partecipant
Argentina (host)	Private entity "IMPSA" Private entity "Asja Ambiente Italia S.p.A."	No

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

Puente Gallego, city of Rosario.

A.4.1.1. Host Party(ies):

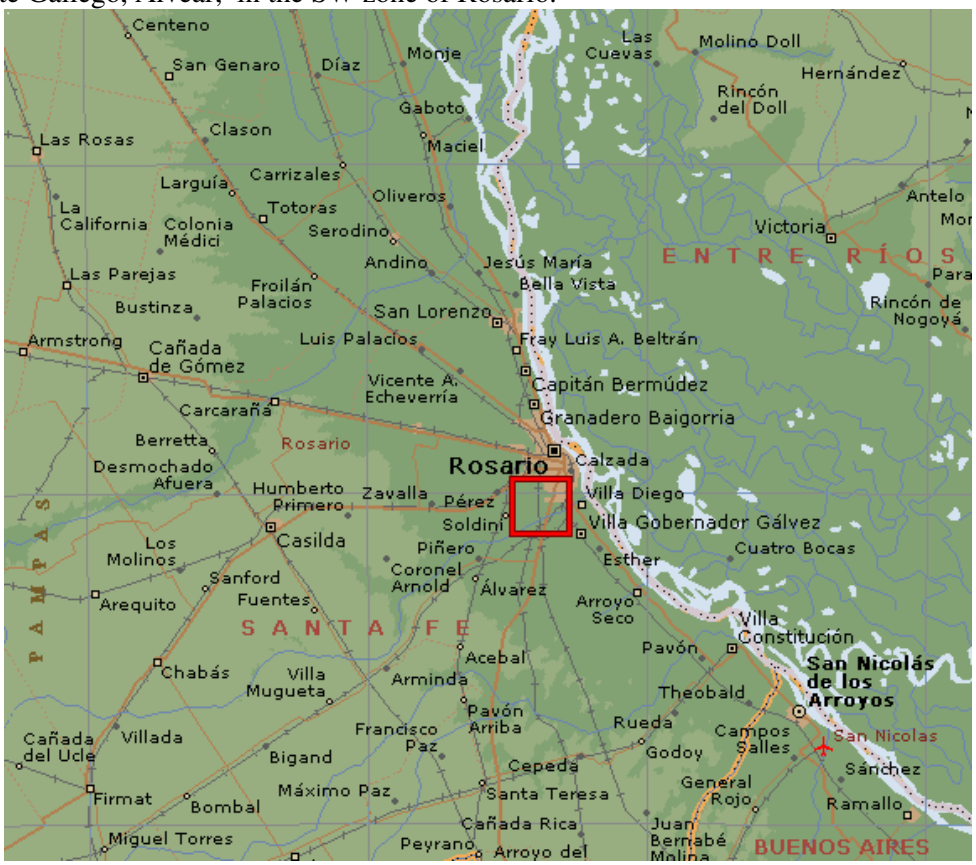
Argentina

A.4.1.2. Region/State/Province etc.:

Province of Santa Fe

A.4.1.3. City/Town/Community etc:

Puente Gallego, Alvear, in the SW zone of Rosario.



Rosario map

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

The landfill has operated from 1995 until 2003. The Puente Gallego landfill is divided into the modules: Gallego I, Gallego II/a, Gallego II/b and Gallego III. Approximately 2.5 million of tons of wastes have been disposed in them.

The project means to capture the biogas from Gallego II/a, Gallego II/b and Gallego III, in which approximately 1.8 tons of wastes have been disposed.

A.4.2. Category(ies) of project activity:

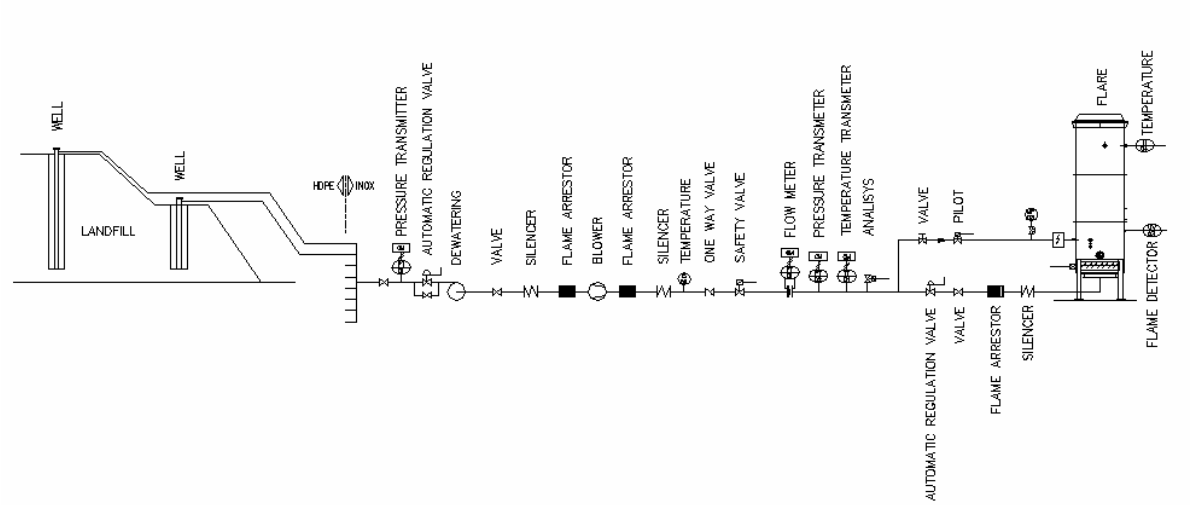
No. 13 Waste handing and disposal, specifically the capture of the biogas that result from anaerobic decomposition of organic waste deposited in the landfill site.

A.4.3. Technology to be employed by the project activity:

The project involves installation of a landfill gas recovery system at the site, using a proven technology according to EU and Argentine requirements.

Asja Ambiente Italia SpA has already used this technology in more than 20 landfill sites in Italy.

Equipments to be installed in the project include:
- gas collection network, comprising permeable pipes, gas domes, gas wells;
- high temperature gas flares;
- biogas monitoring and control equipment;
- civil works;
- electrical connections to the public grid;
- biogas-fueled generator.



The biogas captation section is a network of wells and connected pipes, that creates a suction pressure for biogas extraction.
Exploited biogas is flared in low emission, high temperature flares (>950ºC, retention time >0,3 s).
The plant is equipped with a monitoring system for CH_4, O_2, flow, pressure and temperature.
The plant is connected to the public grid and is also equipped with a biogas-fueled generator to satisfy the energy demand of the plant itself.
Local operators will be trained for the maintenance and control activities. Local operators will be supported by a telephone helpdesk and experts will care for the mainteance whenever needed.

A.4.4. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed CDM project activity, including why the emission reductions would not occur in the absence of the proposed project activity, taking into account national and/or sectoral policies and circumstances:

The primary purpose of this project is the extraction and combustion of landfill-generated biogas.
The primary component of biogas is CH_4 (>50%), which has a global warming impact 21-times worse than CO_2. By burning the CH_4 contained in biogas, CH_4 is destroyed resulting in an emission reduction of this very damaging greenhouse gas.
Technical, legal, economic and financial conditions for biogas recovery do not exist in Argentina.
Biogas is thus leaking out from the landfill into the atmosphere.
The baseline scenario is defined as the most likely future scenario in the absence of the proposed CDM activity.
Based on this analysis the baseline scenario is the continued uncontrolled release of biogas into the atmosphere.
In the absence of a CDM project being developed at the Puente Gallego landfill, there is no economic incentive for the collection and combustion of biogas produced by the landfill.

There is no revenue from generation of electricity in this project because generated electricity is not supplied to public grid.
It is clear then that without the added economic incentive of the sale of CERs and in the absence of laws or regulations mandating the collection and flaring of biogas, the project would not be carried out.
Therefore, the proposed project is additional.
Captation and combustion of the CH_4 component of biogas will result in the avoidance of carbon emissions into the atmosphere of approximately 0.6 million tons of CO_2 over a 10-year period.

A.4.4.1. Estimated amount of emission reductions over the chosen crediting period:

Year	Annual Estimation of emission reductions in tonnes CO_{2e}
2006	92.018
2007	97.921
2008	85.513
2009	74.159
2010	64.125
2011	55.382
2012	48.103
2013	42.644
2014	38.517
2015	35.128
2016	5.343
Total estimated reductions: (tonnes of CO_{2e})	638.854
Total number of crediting years:	10
Annual average over the crediting period of estimated reductions: (tonnes of CO_{2e})	63.885

A.4.5. Public funding of the project activity:

None

SECTION B. Application of a baseline methodology

B.1. Title and reference of the approved baseline methodology applied to the project activity:

The project uses the approved baseline methodology AM0011 "Landfill gas recovery with electricity generation and no capture or destruction of methane in the baseline scenario".

B.1.1. Justification of the choice of the methodology and why it is applicable to the project activity:

Baseline methodology AM0011 is designed for project activities focused on landfill gas captation and flaring.

The following conditions make this methodology applicable to the project:

- Argentina has no national framework which governs the management and operation of landfills; but rather, technical norms issued by provincial authorities which do not include technical requirements on LFG management;
- There is currently no captation or destruction of CH_4 at the Puente Gallego landfill, and all of the CH_4 is released into the atmosphere according to the baseline;
- The project will not claim emissions reductions related to energy displacement;
- The captured biogas will be flared and used to generate energy consumed by the plant itself;

B.2. Description of how the methodology is applied in the context of the project activity:

According to AM0011, "the greenhouse gas emission reduction achivied by the project activity during a given year (ER_y) is the amount of methane actually destroyed during the year ($MDproject_y$) times the approved Global Warming Potential value for methane (GWP_CH_4)".

$ER_y = MDproject_y \times GWP\_CH_4$

ER_y is measured in tonnes of CO_2 equivalents (tCO_{2e}).

$MDproject_y$ is measured in tonnes of methane (tCH_4) .

The approved Global Warming Potential value for methane (GWP_CH_4) for the first commitment period is 21 tCO_{2e}/tCH_4.

The methane destroyed by the project activity ($MDproject_y$) during a year is the sum of the methane flared and used to generate electricity.

$MDproject_y = CH_4flared_y + CH_4electricity_y$

The $CH_4flared_y$ and $CH_4electricity_y$ are measured in cubic meters (m^3) and are determined by measuring the volume of landfill gas used for each of these purposes and the methane concentration in the landfill gas. The volume of methane is then converted into tonnes of methane using the molecular weight and molecular volume of methane.

An emission reduction estimation is achivied using a first order kinetic model.

These estimates are for reference purposes only, since emission reductions will be determined by measuring the actual quantity of methane captured and used for electricity generation or flaring once the project activity is optional.

According to AM0011 the baseline scenario is the release of the landfill gas into atmosphere.

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity:

The AM0011 uses economic and financial criteria to determine whether the proposed project activity is additional. In addition, AM0011 requires that the regulatory framework has to be verified if laws would implement similar projects.

Baseline scenario determined by applying the AM0011 methodology:
The city of Rosario and municipalities surrounding the site send their domestic waste to the landfill.
The waste deposited in the landfill has a high organic content, which causes the production of large quantities of biogas.
As there is no law mandating the captation or flaring of this gas, the most economic and therefore most likely scenario would be do nothing and allow the biogas to be released into the atmosphere.

Project scenario:
The project will collect about 65% of the biogas produced at the Puente Gallego landfill site.
The collected biogas will then be flared with a considerable reduction of CH_4-emissions into the atmosphere.

Determination of why the emissions in the baseline scenario would likely exceed emissions in the project scenario:
There is no requirement of flaring the biogas generated at the landfills according to the current laws in Argentina.
Also technical, organizational, economic and financial conditions in Argentina make the landfill gas recovery not useful.
As the amount of CH_4 which is not released into the atmosphere from the landfill site can be measured, it is possible to calculate GHG emissions reductions using equivalent CO_2 tonnes.
The amount of CH_4 released into the atmosphere is equivalent to the amount that could be captured and flared.
Applying AM0011 methodology the additionality of the proposed CDM project is determined in four steps:

Step 1:	Assessment of legal requirements related to the landfill gas emissions
Step 2:	Demonstration that there is no economically attractive scenario that involves the recovery of landfill gas
Step 3:	Barriers and common practice analyses based on IRR calculations
Step 4:	Extra check on creditability of the baseline

Step 1: Assessment of legal requirements related to landfill gas emissions:
Most of the laws regarding environmental management in Argentina have been created over the last 5 years.
Current Argentinean laws do not require landfill managers to flare the biogas produced at the landfill sites, but to minimize explosion risks
Moreover enforcement in Argentina is very limited due to strict constraints on public funds during the recent economic recession. The situation doesn't seem that will be different in the future.

Step 2: Demonstration that there is no economically attractive scenario that involves the recovery of landfill gas:
There is no economic incentive to capture and exploit the landfill biogas in Argentina.

CONSIDERED SCENARIOS	EVALUTATION	ASESSMENT
No biogas recovery	All of the CH_4 is released into the atmosphere.	Likely
Lower amount of biogas is extracted	Costs of investment to set up a plant of biogas captation are too high to justify a plant for the exploitation of a lower amount of biogas.	Unlikely
Air or O_2 injection is applied to the landfill	Alternative technologies are more expensive than biogas captation and flaring. No alternative technology would be applied and biogas would be anyway released into atmosphere.	Unlikely
Recycling will strongly increase, or composition of disposed waste will significantly change	The change is not applicable because the landfill is already closed	Unlikely
Different use of biogas on-site is proposed	The amount of biogas produced is too low to consider the investment economically-attractive. Biogas would be anyway released into the atmosphere.	Unlikely
A different use of biogas off-site is proposed	As there is not yet a gas infrastructure in the surrounding area, creating a gas pipeline is an unattractive investment. Biogas would be anyway released into the atmosphere.	Unlikely
The project is delayed	Biogas produced over the years before the beginning of the project is fully released into the atmosphere. The amount of biogas produced in the first years is greater than the amount of biogas produced in the following years. This amount of biogas would be released into the atmosphere.	Unlikely
Proposed project	Biogas is flared.	Unlikely

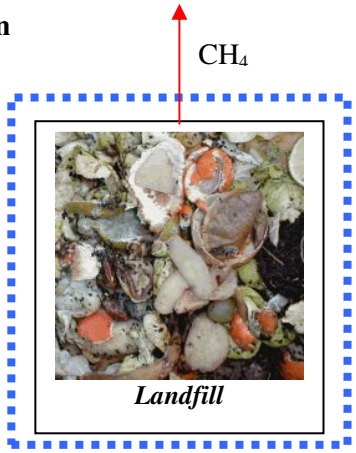
The most economical scenario is not to recovery biogas because requires no investment costs.

Step 3: Barriers and common practice analyses based on IRR calculations:
There is no revenue from the electric power generation because electricity is not supplied to public grid.
As the baseline scenario is compared to the basis of long-term costs, Step 3 is not applicable.

Step 4: Extra check on creditability of the baseline:
Is the baseline scenario realistic from a financing prospective?
As there are no potential buyers of biogas as fuel in the surrounding zones, investment costs are too high to consider biogas exploitation as profitable.
Would there be sufficient local support for the baseline scenario?
Local inhabitants do not seem to be interested in the release of the biogas generated from the landfill, so baseline scenario is supported.
Would other physical obstructions impede baseline scenario from ever being realized?
As baseline scenario is naturally realized, there are no physical obstructions to stop it.
Would legislation or other obligations influence the baseline scenario?
No legislation is anticipated or prepared that will require the combustion of biogas. The legislation will be monitored.

The project is additional because:

- **There is no prescription about LFG captation**
- **Capturing LFG is economically unattractive**
- **The baseline scenario is no captation of CH_4**
- **The baseline is locally supported**



BASELINE

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the project activity:

The project boundary is the landfill site.

Activities that will be included within the project boundary are: *Biogas combustion,Drillings,Civil works*

Emissions that are likely to be less than 1% of the total emission impact of the project will be classified as "insignificant" and be further ignored in the project. As the total emission reduction expected by the project over the 10-year project lifetime is 638.854 tonnes of CO_2, 1% amounts to 6.388 tonnes CO_2.

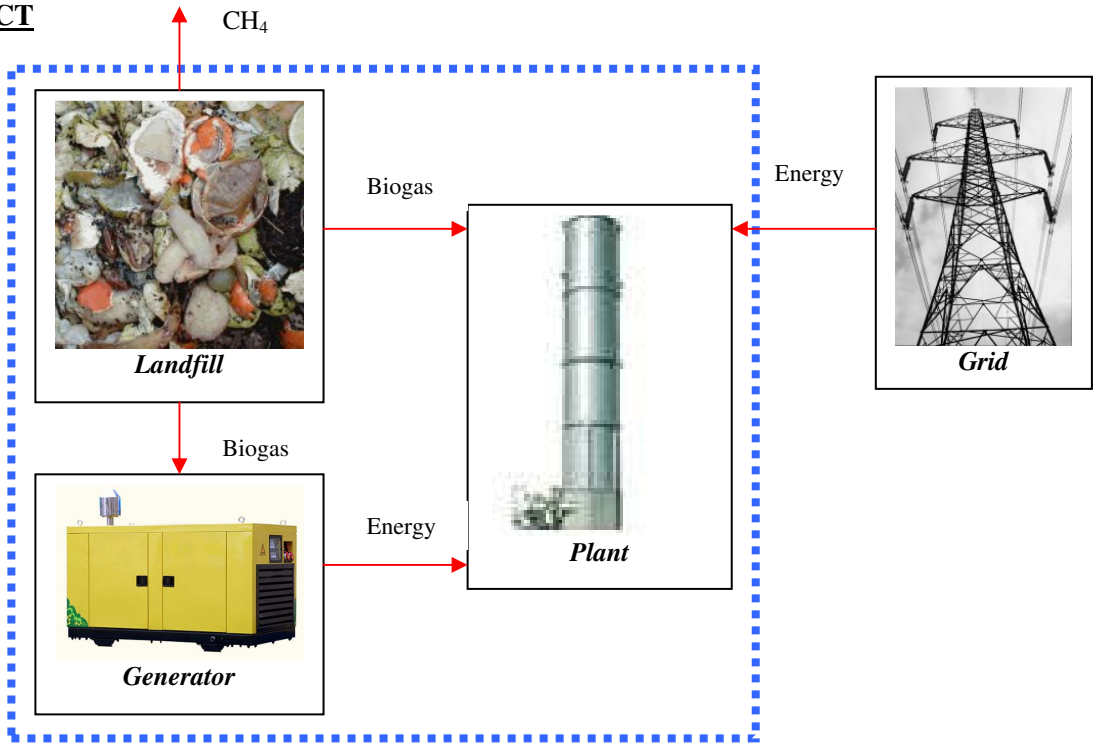
All emissions included within the system boundaries will be taken into account and included in the calculation of the baseline and project monitoring. Emissions that are not included in the boundary system will not be included in the baseline calculations and monitoring.

Energy generated inside the project boundaries is enough to minimize leakages from public grid.

Public grid will supply electricity to the plant during generator failures.

High flare efficiency values will minimize emissions from torches

CDM PROJECT



B.5. Details of baseline information, including the date of completion of the baseline study and the name of person (s)/entity (ies) determining the baseline:

This baseline study was concluded on 08/09/2005, by Asja Ambiente Italia SpA

Contact information:
Asja Ambiente Italia SpA
Via Ivrea 70
Rivoli (TO)
Zip code: 10098
Country: Italy
Contact person: Carlo Vigna Taglianti
Job title: Project Manager
Telephone number: +39 011 9579201
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Email : cvt@asja.biz

SECTION C. Duration of the project activity / Crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

01/12/ 2005

C.1.2. Expected operational lifetime of the project activity:

10 years and 3 months

C.2 Choice of the crediting period and related information:

The project activity will use a fixed crediting period

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

Not applicable

C.2.1.2. Length of the first crediting period:

Not applicable

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

01/03/2006

C.2.2.2. Length:

10 years and 0 months

SECTION D. Application of a monitoring methodology and plan

D.1. Name and reference of approved monitoring methodology applied to the project activity:

This project activity uses the approved monitoring methodology AM0011 for "Landfill gas recovery with electricity generation and no capture or destruction of methane in the baseline scenario".

D.2. Justification of the choice of the methodology and why it is applicable to the project activity:

The chosen monitoring methodology is designed for the project activities that reduce greenhouse gas emissions through landfill gas capture and flaring.

The conditions for the methodology to be applied are respected:

- This monitoring methodology is based on direct and continuous measurement of the actual amount of landfill gas used and its the methane content using a continuous flow meter, a continuous methane analyser, monitoring pressure and temperature and measuring continuously the electricity generated.
- The basis for the monitoring of the emission reduction is the measuring of landfill gas amount and composition recovered.
- The CH_4 content of the emissions from flares is analysed to determine the fraction of the CH_4 destroyed.
- The emissions reductions are defined as the difference of emissions in the baseline situation and in the project situation.

D.2. 1. Option 1: Monitoring of the emissions in the project scenario and the baseline scenario

D.2.2.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

This option is not applicable.

D.2.1.2. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

Not applicable.
See section D.2.2.1.

D.2.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived:

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

Not applicable.

D.2.1.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

Not applicable.

D. 2.2. Option 2: Direct monitoring of emission reductions from the project activity (values should be consistent with those in section E).

D.2.2.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number	Data variable	Source of data	Data unit	Measured (m) calculated (c) estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	For how long is archived data kept	Comment
1.	Amount of landfill gas collected from the project wells	PLC Control unit	Nm^3	c	Continuous	100%	Electronic	Duration of the crediting period	Corrected volume according LFG temperature and pressure.
2.	Methane fraction in the landfill gas	Analyzer	%	m	Continuous	100%	Electronic	Duration of the crediting period	Measured by continuous gas quality analyser
3.	Amount of flared methane	PLC Control unit	Tonnes CO_{2eq}	c	Continuous	100%	Electronic	Duration of the crediting period	Measured conform complementary method (LFG temperature and pressure, flare temperature and working hours, %CH4, Sm3LFG/h, oxygen content)
4.	Flare combustion efficiency		%	m and c	Monthly until stable values reached, then semi-annual	n/a	Electronic	Duration of the crediting period	Methane content of exhaust gas
5.	Flare combustion temperature	Temperature transmitter	°C	m	Continuous	100%	Electronic	Duration of the crediting period	There is a temperature gauge to measure a combustion temperature of the flare.
6.	Flow of landfill gas collected from projected landfill	Flow meter	Nm^3/h	m	Continuous	100%	Electronic	Duration of the crediting period	Corrected volume according landfill gas temperature and pressure
7.	Amount of electricity generated	kWh meter	MWh	m	Continuous	100%	Electronic	Duration of the crediting period	Data will be aggregated monthly and yearly
8.	Amount of methane used to generate electricity	PLC Control unit	Tonnes CO_{2eq}	c	Continuous	100%	Electronic	Duration of the crediting period	--

D.2.2.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

Emissions	Significance	Description of formulas
CH_4 not captured by the plant	Significant	Cannot be measured
CO_2 generated to supply energy to plant	Insignificant	A biogas-fuelled generator will be used to supply power to the plant, so CO_2 released during the processing will be zero because it was originally fixed via biomass. The public grid will be used just in case of emergency. $CO_2 = EF * EA$ EF = emission factor EA = energy absorbed by the public grid
CO_2 generated by CH_4 flaring	Insignificant	CO_2 released during the combustion process was originally fixed via biomass so that the life cycle CO_2 emissions is zero.
Emissions of CO_2 from transport of equipment to the project site	Insignificant	Most of the equipment and materials for the construction will be purchased locally. There will be just two transports of special equipment from Italy to Argentina. $CO_2 = NT * (CO_{2tr} + CO_{2sh}) = 3.244,9\ tCO_2 < 1\%$ NT = Number of Transports = 2 CO_{2tr} = CO_2 generated by truck = $EF_{diesel} * KMs = 0,026\ tCO_2$ EF_{diesel} = diesel emission factor = 0.26 $kgCO_2/km$ KMs = distance harbour in Geneva - the place where equipment is assembled= 100 km CO_{2sh} = CO_2 generated by ship = $FC_{ship} * EF_{ship} * D = 1.622,4\ tCO_2$ FC_{ship} = Fuel Consumption = 33,80 t_{fuel}/day EF_{ship} = 3,2 tCO_2/t_{fuel} D = days needed by a ship to travel from Italy to Argentina = 15
Emissions from the venting of biogas (no flaring or incineration)	Non-existing	Emissions from the venting of biogas will not occur thanks to the protection against failures provided by an automatic feedback control system. If there is no flaring or incineration, the venting of biogas from the landfill body will be automatically stopped
Emissions CO_2 from transport of waste to the landfill site	Non-existing	The landfill Puente Gallego has not been in operation since 2003 and therefore carbon dioxide from transport of waste to the landfill is not relevant.

D.2.3. Treatment of leakage in the monitoring plan

D.2.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project activity

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

No leakages are associated with landfill gas extraction.

D.2.3.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

No leakages under AM0011

D.2.4. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

$ER=MD_{project} * GWP_{CH4}$

Wherein: ER are the emission reductions; $MD_{project}$ is the amount of CH_4 actually destroyed/burnt during the year; GWP_{CH4} is the approved global warming potential value for methane;

$$MD_{project} = CH_{4\ flared} + CH_{4\ leachate} + CH_{4\ electricity}$$
$$CH_{4\ flared} = LFG_{flare} * w_{CH4} * D_{CH4}$$
$$CH_{4\ electricity} = LFG_{electricity} * w_{CH4} * D_{CH4}$$
$$CH_{4\ leachate} = 0$$

In this case, $CH_{4\ flared}$ is the amount of CH_4 destroyed by flaring (tCH_4), LFG_{flare} is the amount of landfill gas flared in a 1-year period measured in normal cubic meters (Nm^3), $LFG_{electricity}$ is the amount of landfill gas used to generate electricity in a 1-year period measured in normal cubic meters (Nm^3), w_{CH4} is

the average CH_4 fraction of the landfill gas as measured in a 1-year period and expressed as a fraction of CH_4 volume / biogas volume and D_{CH4} is the CH_4 density expressed in tonnes of methane / cubic meter of CH_4 (tCH_4/m^3CH_4), measured at STP.
This value is in fact 0.0007168 tCH_4/Nm^3CH_4.

D.3. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored		
Data ***(Indicate table and ID number e.g. 3.-1.; 3.2.)***	**Uncertainty level of data (High/Medium/Low)**	**Explain QA/QC procedures planned for these data, or why such procedures are not necessary.**
1.	Low	Calculated
2.	Low	Amount of methane is a reliable indicator subject to routine checks. Calibration is carried out weekly by means of calibration gas with exactly 60% of methane content.
3.	Low	Calculated
4.	Low	Data reviewed as part of quaterly monitoring
5.	Low	Low Data reviewed as part of daily monitoring
6.	Low	Flow meters will be subject to a regular maintenance and testing regime to ensure accuracy
7.	Low	Electricity meters are subject to a regular maintenance
8.	Low	Calculated

D.4 Please describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity

To assure a correct monitoring, the training of the Argentinean staff will be organised.
Minimum 2 people will be trained:
• general knowledge about the equipment used in the landfill
• reading and recording data
• calibration methodology
• emergency situation (for instance too high oxygen level or electricity breakdown).

Chosen trainees will have a good understanding the processes and installation technology of the landfill gas extraction.
Verification and training start parallel with preliminary works for the installation.
A guidebook about landfill gas extraction and utilization in Italian and Spanish will also be available. The guidebook will have:
• operation manual
• drawings
• maintenance instructions
• description of parts of the equipment
• parameters for landfill gas composition, temperature and pressure.

Additionally the telephone helpdesk will be available with direct connection to Italy, where experts of Asja Ambiente Italia S.p.A. can give technical advice.

D.5 Name of person/entity determining the monitoring methodology:

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SECTION E. Estimation of GHG emissions by sources

E.1. Estimate of GHG emissions by sources:

An estimation of the potential landfill gas production has been performed estimating the production of biogas based on LandGEM v. 3.02 calculation methodology and Asja Ambiente Italia SpA experience. LandGEM uses the following first-order decomposition rate equation to estimate annual emissions over a specified time period.

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_0 \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

wherein
Q_{CH4} = annual methane generation in the year of the calculation (m^3/year)
i = 1-year time increment
n = (year of the calculation) – (initial year of waste acceptance)
j = 0.1 year time increment
k = methane generation rate ($year^{-1}$)
L_0 = potential methane generation capacity (m^3/Mg)
M_i = mass of waste accepted in the i^{th} year (Mg)
t_{ij} = age of the j^{th} section of waste mass Mi accepted in the i^{th} year (decimal years)

The following equation has been used to estimate project emissions:

$$CH_4Q_y = \frac{Q_{CH_4\,y} * (1 - CE)}{H} \quad (1)$$

wherein
Q_{CH4} = annual methane generation in the year of the calculation (m^3/year)
CH_4Q_y = CH_4 quantity in the year of the calculation (Nm^3/h)
H = hours per year
CE = captation efficiency

The values obtained from (1) have been used to calculate emissions using the following equations:

$$CH_4P_y = CH_4Q_y * WH_y$$

$$E_y = CH_4P_y * D_{CH_4} * GWP_{CH_4}$$

wherein
CH_4P_y = CH_4 in the year of the calculation (Nm^3/year)
WH_y = working hours in the year of the calculation (hours/year)
CH_4Q_y = CH_4 quantity in the year of the calculation (Nm^3/h)
E_y = emissions in the year of the calculation (tCO_{2eq}/year)
D_{CH4} = Methane density at standard temperature and pressure (tCH_4/m^3CH_4)
GWP_{CH4} = Methane Global Warming Potential

Year	CH_4 quantity Nm^3/h	h / yr	Nm^3 of CH_4 /yr	tCO_{2eq}/yr
2006	451,0	7.300	3.292.300	49.558
2007	399,8	8.760	3.502.248	52.719
2008	349,2	8.760	3.058.992	46.046
2009	302,8	8.760	2.652.528	39.928
2010	261,8	8.760	2.293.368	34.522
2011	226,1	8.760	1.980.636	29.814
2012	196,4	8.760	1.720.464	25.898
2013	174,2	8.760	1.525.992	22.970
2014	157,3	8.760	1.377.948	20.742
2015	143,4	8.760	1.256.184	18.909
2016	130,9	1.460	191.114	2.877

Project emissions are from the CH_4 not captured.
The CO_2 released during the combustion process was originally fixed through biomass so that the life cycle of CO_2 emissions of biogas is zero.

E.2. Estimated leakage:

According to AM0011 no leakage is expected as a result of the project activity.

E.3. The sum of E.1 and E.2 representing the project activity emissions:

As no leakage is identified, the sum of E.1 and E.2 equals E.1.

E.4. Estimated anthropogenic emissions by sources of greenhouse gases of the baseline:

The following equation has been used to estimate baseline emissions, instead of (1):

$$CH_4Q_y = \frac{Q_{CH_4\,y}}{H} \qquad (2)$$

wherein
Q_{CH4} = annual methane generation in the year of the calculation (m^3/year)
CH_4Q_y = CH_4 quantity in the year of the calculation (Nm^3/h)
H = hours per year
CE = captation efficiency

Year	CH_4 quantity Nm^3/h	h / yr	Nm^3 of CH_4 /yr	tCO_{2eq}/yr
2006	1.288,4	7.300	9.405.320	141.576
2007	1.142,4	8.760	10.007.424	150.640
2008	997,7	8.760	8.739.852	131.559
2009	865,2	8.760	7.579.152	114.087
2010	748,1	8.760	6.553.356	98.646
2011	646,1	8.760	5.659.836	85.196
2012	561,2	8.760	4.916.112	74.001
2013	497,6	8.760	4.358.976	65.615
2014	449,4	8.760	3.936.744	59.259
2015	409,8	8.760	3.589.848	54.037
2016	374,0	1.460	546.040	8.219

E.5. Difference between E.4 and E.3 representing the emission reductions of the project activity:

The volume of methane actually captured is an indication of the volume of methane that would be released without the project. The methane actually captured will be directly monitored.

Year	Annual Estimation of emission reductions in tonnes CO_{2e}
2006	92.018
2007	97.921
2008	85.513
2009	74.159
2010	64.125
2011	55.382
2012	48.103
2013	42.644
2014	38.517
2015	35.128
2016	5.343
Total estimated reductions: (tonnes of CO_{2e})	638.854
Total number of crediting years:	10
Annual average over the crediting period of estimated reductions: (tonnes of CO_{2e})	63.885

E.6. Table providing values obtained when applying formulae above:

The following table represents the avoided emissions of GHG thanks to the CDM project activity over the period 2006-2016 resulting from the recovery and combustion of landfill gas.
It should however be noted that the amount of CERs will be determined by monitoring the amount of captured biogas and its CH_4 content.

Year	Estimation of project activity emissions (tonnes of CO_{2e})	Estimation of baseline emissions (tonnes of CO_{2e})	Estimation of leakage (tonnes of CO_{2e})	Estimation of emission reductions (tonnes of CO_{2e})
2006	49.558	141.576	0	92.018
2007	52.719	150.640	0	97.921
2008	46.046	131.559	0	85.513
2009	39.928	114.087	0	74.159
2010	34.522	98.646	0	64.125
2011	29.814	85.196	0	55.382
2012	25.898	74.001	0	48.103
2013	22.970	65.615	0	42.644
2014	20.742	59.259	0	38.517
2015	18.909	54.037	0	35.128
2016	2.877	8.219	0	5.343
Total	343.983	982.837	0	638.854

According to AM0011 emission reductions can be directly estimated using the quantity of captured CH_4.

Year	CH_4 quantity Nm^3/h	h / yr	Nm^3 of CH_4 Captured /yr	tCO_{2eq}/yr
2006	837,5	7.300	6.113.750	92.029
2007	742,5	8.760	6.504.300	97.908
2008	648,5	8.760	5.680.860	85.513
2009	562,4	8.760	4.926.624	74.159
2010	486,3	8.760	4.259.988	64.125
2011	420,0	8.760	3.679.200	55.382
2012	364,8	8.760	3.195.648	48.103
2013	323,4	8.760	2.832.984	42.644
2014	292,1	8.760	2.558.796	38.517
2015	266,3	8.760	2.332.788	35.115
2016	243,1	1.460	354.926	5.343

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

Legal framework:
The future biogas collection and utilisation system will fully comply with Argentinean legislation in the field of Air Protection and Waste Management:

• NATIONAL LEGISLATION
Constitution of the Nation Argentina - Arts. 41 and 42
Law of Dangerous Residuals Nº 24.051 (B.O. 27.307 of the 17/01/92)
I decree Regulation 831/93 (B.O. 27.630 of the 3/5/93)
Ley 25.916 Management of Domiciliary Remainders

• COUNTY OF SANTA FE
Constitution of the County of Santa FE Art. 28.-
Law Nº 11717 Means Atmosphere and Sustainable Development of the 18 of November of 1999.-
Decree Nº 0101 Impact and Environmental Audit , Regulation of the law 11717 of the 27 of February of 2003.-
Decree Nº 1844 Dangerous Remainders, it regulate the Arts 22 and 23 of the Law 11717 of the 27 of August of 2002.-
Resolution Nº 201 Quality of the Air of the 21/12/04.-
Decree Nº 1292 Annexed Unico Text regulated of the Arts. 3,4,5,7,8,9,10,12,13 y 14 Of the law Nº 11717 sanctioned of 16/07/04.-
Law Organic of Municipalities Nº 2756 , Art. 41 of 12/07/85, Ordered Text Approved by Decree 0067-85

• MUNICIPAL ORDINANCE of the city of Rosario:
Nº 7368 Solid Remainders Domiciliary. Disposition. Date 01/08/2002.-
Nº 5820 Norms of Quality of the Air.-

There is no national framework governing land filling, but only technical norms issued by the Environmental Political Secretaries of each Argentinean County without technical requirements of LFG Management.

An EIA has been done to verify environmental impacts of the project activity, and all of them were considered positive.
The following licences were requested and will be available for DOE:

- Environmental ability licence

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

Argentinean policy for waste management focuses primarily on dangerous waste.
There is no legislation regarding leachate treatment and landfill degassing.

Environmental impact of the project:

Landscape and biotic aspects

Extraction of several toxics, odorous and GHG gases has a positive influence on the environment.
Sudden vibrations of the ground, as result from activities onsite, may disturb the surrounding wildlife in forests and fields.
Due to the elimination of risks of fires or explosions, re-cultivation of the landfill is possible and the closed landfill is no longer considered as a barren land.
Appropriate covering of the landfill is favourable for biogas production, it enables the landfill owner to reshape the waste body and make it fit into the landscape.

Waste

The project does not result into any increase of waste production.
Appropriate waste compaction reduces, moreover, the risk of fire on the landfill.

Air & climate

The project has a positive effect on the ecosystem due to the reduction of GHG emissions and other bases, such as H_2S, mercaptenes and other various compounds.
Odours from gases or liquid emissions from landfill sites is minimised by appropriate collection and management of the biogases and infiltrates discharged during the decomposition.
The only potential source of CO_2 emissions is the transport of machinery to the landfill and other conveying machines, on-site installations such as ventilators or measurement equipment.
These emissions are insignificant. In order to minimise CO_2 emissions from transport and site-installations during the implementation and fulfilment of the project, most of the equipment and materials is purchased locally.

Health & safety

High concentration of gases in the landfills brings about a risk of explosion. Their extraction minimizes the risk.
It is important not only for safety reasons concerning the inhabitants of the surroundings but also for health of the workers that spend most of the day at the landfill.
The release of toxic compounds such as H_2S presents a serious danger for human health.
The extraction of biogas reduces the presence of these compounds considerably.

Noise

Installed equipment can produce some noise.
To reduce its impact, trees and shrubs will be planted thus forming a perfect sound-absorbing casing.

Conclusions:
The landfill collection and flaring system has a significant positive impact on the environment.
The system reduces emissions of greenhouse gases, odours and gases causing explosions as well as open fires and damage to wildlife. The project guarantees as follow:
• Reduction of negative effects on climate and air quality
• Reduction of negative impacts to flora and fauna in the surroundings
• Improvement of the socio-economic environment (necessary infra-structure, legal and institutional requirements).

SECTION G. Stakeholders' comments

G.1. Brief description how comments by local stakeholders have been invited and compiled:

Stakeholders were identified as local population that has been living near the landfill (south zone) or works at it and governmental, educational or environmental entities interested or involved with the project.

Several meetings have also been held with identified stakeholders to obtain their comments about the project.

Each group of stakeholders has been invited using different ways, mostly by e-mail or phone.

Stakeholders were informed, according to their group, about:

1. Problems caused by solid wastes
2. Clean development Mechanisms, GHG and Kyoto protocol
3. Reason to capture the biogas
4. Detailed descriptions about the landfill site.
5. Benefits Generated by a degassing plant
6. Advantages of biogas treatment.
7. Adopted hypothesis and biogas production model
8. Information about UTE Asja Ambiente Italia SpA - Impsa

During all of these meetings the project has been discussed with stakeholders.

All comments have been received in printed forms exclusively prepared by UTE Asja Ambiente Italia SpA - Impsa at the end of each meeting

In order to inform local population, media publish news about the project on local newspapers.

G.2. Summary of the comments received:

Received comments show that stakeholders agree with the project.
Stakeholders understand that the project generates benefits to the environment and to local communities.

G.3. Report on how due account was taken of any comments received:

As received comments have been positive, the plant can be realized and it is not necessary to modify the project.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Impsa
Street/P.O.Box:	Viamonte 1526
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FAX:	+54 11 51280385
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Represented by:	--
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Salutation:	--
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Street/P.O.Box:	Via Ivrea 70
Building:	
City:	Rivoli
State/Region:	Turin
Postfix/ZIP:	10098
Country:	Italy
Telephone:	+39 11 9579201
FAX:	+39 11 9579241
E-Mail:	info@asja.biz
URL:	--
Represented by:	--
Title:	Geom.
Salutation:	--
Last Name:	Vigna
Middle Name:	--
First Name:	Carlo
Department:	--
Mobile:	--
Direct FAX:	
Direct tel:	+39 11 9579235
Personal E-Mail:	cvt@asja.biz

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No funds from public national or international sources will be used in any aspect of the proposed project.

Annex 3

BASELINE INFORMATION

Symbol	Item	Adopted Value	Unit	Source
GWP_{CH4}	Methane Global Warming Potential	21.0	-	IPCC Second Assessment Report: Climate Change 1995
w_{CH4}	Average methane fraction of the landfill gas	50	%	Asja Ambiente Italia SpA experience
D_{CH4}	Methane density at standard temperature and pressure	0,0007168	t/Nm^3	Consolidated baseline methodology for landfill gas project activities
CE	Captation Efficiency	65	%	Asja Ambiente Italia SpA experience

Disposed waste

Year	Module	Tons
1997	Gallego II	258.000
1998	Gallego II	286.000
1999	Gallego II	286.000
2000	Gallego II	286.000
2001	Gallego II	31.000
2001	Gallego III	255.000
2002	Gallego III	286.000
2003	Gallego III	137.000

Biogas quantity produced

Year	Nm^3/h	Nm^3/y
2006	2.577	22.574.520
2007	2.285	20.016.600
2008	1.995	17.476.200
2009	1.730	15.154.800
2010	1.496	13.104.960
2011	1.292	11.317.920
2012	1.122	9.828.720
2013	995	8.716.200
2014	899	7.875.240
2015	820	7.183.200
2016	748	6.552.500

Annex 4

MONITORING PLAN

Introduction

Monitoring will be carried out following the procedures set by the Approved Methodology AM0011.
The Monitoring methodology is based on direct measurement of the amount of flared CH_4 in biogas to determine avoided CO_{2eq}.
An operative manual of the project will be written. This manual will have the applicative documents of the monitoring plan (description of the project and responsabilities, operative procedures for measurements and handlings of data and details about internal audits)
Two operators will collect necessary datas for the monitoring plan and a Project Manager will verify the correct application of the operative procedures written in the manual.

Monitoring

The amount of CH_4 used is determined by monitoring the following:

- Amount of captured biogas (m^3) using a continuous flow meter and monitoring temperature and pressure;
- Percentage of CH_4 in biogas using a continuous analyzer.

In addition

- the CH_4 content of the emission flares will be analyzed quarterly to determine the fraction of the CH_4 destroyed;
- The amount of electricity generated will be continuously measured.

Calculation on the amount of ERs

The amount of Nm^3 captured from biogas will be multiplied by the CH_4 content of that time period.
The amount of ERs will be calculated on the basis of continuously calculated and logged amounts of combusted CH_4 in Nm^3:

- Calculate tonnes of burnt CH_4 by multiplying the volume of burnt CH_4 (Nm^3) with the density of CH_4
- Obtain emission reductions by multiplying tonnes of burnt CH_4 with the global warming potential of CH_4.

$$CO_{2eq} = Q * M * Sp * F$$

$CO_{2eq} = CO_{2\text{-equivalents}}$ *[tonnes* CO_{2eq}*]*
Q = quantity landfill gas [Nm^3*]*
M = methane content [Vol.%]
Sp = specific mass methane (constant) = 0,0007168 t/Nm^3
F = equivalent factor methane (constant) = 21 tonnes CO_{2eq}*/tonnes* CH_4

Flow meter

The biogas quantity will be measured by means of a flow meter, a counter which counts every m^3 of biogas.
The gas quantity will be adapted from the influence of pressure and temperature by means of an electronic volume adaptor, shown in a display.
The counted gas quantity will be provided to the data-logger of the degassing installation.
The electronic volume adapter is given an alphanumeric password to protect possible tampering, besides the instrumentation is installed inside a locked box.
The biogas quantity will be logged and transferred to the database of the monitoring system.
To tackle the problem of data-handling, the authorized validator reads the biogas quantity from the on-site flow meteronce a year.
This biogas quantity will be written on an official document and signed by the validator.
To prove the logging procedure and database are correct, the quantity recorded by the flow meter must be higher than the flow quantity logged earlier and lower than the the flow quantity logged later.
Flow meter doesn't require calibrations according to its specifications.
To limit the time of operation with no flow signal in case of failure, the flow meter will be exchanged by means of a spare flow meter as soon as possible.
Despite this quick exchange the degassing installation operates a short time without flow signal and CO_{2eq} values.
To determine the flow during this time span, the average flow of the last 7 days will be used and so it is possible to calculate the reduced CO_{2eq} quantity. The chance of failure of the flow meter is very small.

kW.h meter

The electrical power generation will be measured by means of a kW.h-meter, a counter that counts every generated kW.h.
This quantity of electrical power generation shown on its display is true and cannot be altered because the kW.h meter is sealed.
The kW.h meter also provides the signal "quantity electrical power generation" to the datalogger of the degassing installation.
The electrical power generation will be sampled and stored in the data logger of the installation and transferred to the monitoring system.
Once a year the authorized validator reads the quantity of electrical power generation from the kW.h-meter, writes it on an official document and signs it.
This fixed and true quantity will also be a (manually) input of the database.
To prove that the logging procedure and database are correct, the recorded electrical power generation has to be higher than the electrical power generation logged earlier and lower than the electrical power generation logged later.
To limit the time of operating with no kW.h meter in case of failure, this kW.h meter will be exchanged by means of a spare kW.h meter as soon as possible.
Despite this quick exchange the degassing installation operates a short time without measuring the electrical power generation.
To determine the generated electrical power during this time span the average electrical power generation of the last 7 days will be used. The chance of failure of the kW.h meter is very small.

CH_4 analyzer

The CH_4 content of the biogas will be measured by means of a CH_4 analyzer, whose accuracy is ± 2,0 Vol.% CH_4.
The CH_4 analyzer has to be calibrated according its calibration protocol.
The CH_4 content will be sampled and stored in the data logger of the installation and these data will be transferred to the monitoring system. The condition of correct logged CH_4-values is the calibration of the CH_4 analyzer according to the calibration protocol.
In the calibration protocol main issues important for a correct calibration are:

1. The calibration frequency has to be correct.
2. The quality of the calibration gas has to be according to the standard.
3. The calibration procedure, carried out by the operator, has to be correct.

The calibration frequency can easily be checked in the database.
Before calibration the analyzing system has to be switched in position calibration.
The calibration gases will be purchased from certified gas suppliers.
All in gas bottles stored calibration gases will be provided with a quality certificate.
The quality certificate indicates the quality of calibration gas is according to the standard.
To prove the calibration procedure will be carried out correctly, the skilled operator demonstrates this procedure to the authorized validator at the installation.
The operators are well trained and possess the necessary certificates.
At the end of the yearly visit to the installation the authorized validator writes the CH_4-content of that moment on an official document.
Additional the frequency of calibration and the correct demonstration of calibration will be written down on this official document. The validator signs this document.
To limit the time of operation with no methane analyzer in case of failure, this analyzer will be replaced with a spare analyzer as soon as possible.
Despite this quick exchange, the degassing installation operates a short time without CH_4-signal. To determine the CH_4-content during this time span the average CH_4-content of the last 7 days will be used.

Possible failure: No electrical power

When there is no electrical power the blower of the degassing installation cannot operate, so no biogas stream is available.
The flow-meter detects no biogas stream and no CO_{2eq} will be counted and no special actions are possible to avoid this.

Validator

The following parameters and items will be checked by the authorized validator at the installation once a year.

Nr.	Parameter / item	Unit
1	biogas quantity	Nm^3
2	Generated electrical power	kW.h
3	CH_4 content biogas	Vol.% CH_4
4	Calibration procedure CH_4 analyzer	-
5	Log book operating and maintenance	-

The parameters will be written down on a special document by the validator.
Additionally the statement “the calibration protocol is carried out correctly” will be mentioned on this document.

Annex 5

OPINION NOTE

- Report about the presentation to the INTI -CEMROS
- Report about the presentation to the inhabitants of the Gallego Landfill
- Media coverage

Report about the presentation to the INTI -CEMROS
(National Institute of Industrial Technology – Rosario Regional Centre)

Date: 21 /07/05

Venue: IT room INTI
Address: Esmeralda y Ocampo – Rosario
Tel: (0341) 481-5976 / 482-1030 / 482-3283
www.inti.gov.ar
E-mail: cemros@inticemros.gov.ar

Anybody interested in the presentation had free admission. Personal invitation cards were sent according to the following model:

asja.biz looking forward

TySA
UNA EMPRESA DE LA CORPORACION IMPSA

Mr/Ms:
c/o office:

Mr/Ms or his/her representative is kindly invited to take part in the meeting about the biogas captation in monitored landfills, the advantages for the environment and sustainable development – Application case: Monitored Landfill of Puente Gallego in the city of Rosario, by Asja Ambiente Italia SpA technicians. The meeting will take place on July 21st 2005 at 10:30 a.m. in the CEMROS (ROSARIO REGIONAL CENTRE) branch of the INTI, Esmeralda y Ocampo.-

For further information, please contact Mr Emilio Cavalli, Tel. No. 155902040 / 4-661789, e-mail address: **lime@arnet.com.ar**

The following personalities and authorities were invited :

Number	Institution
1	Dr. Ing. Sanitaria UNR
2	PA General Director
3	M. A. Director
4	Facultad Católica de Química
5	IRAM
6	Secretariat for Environment and Sustainable Development, Santa Fe
7	P.Ambiental
8	Director of Igiene Urbana
9	South-West District
10	Coordinator of the South-West District Health Centre
11	Director of monitored landfills
12	Environmental policy
13	Coordinator of the San Vicente Health Centre, Paul-Puente Gallegos
14	Environment - South-West District
15	Séptima Región S. A.
16	Member of the HCMR Ecological Commission
17	Member-President of the HCMR Ecological Commission
18	Ministry of Trade, Santa Fe
19	LIME Operation Manager
20	ISASA Sales Manager

The following people were sent a digital support of the presentation:

- ❖ President of the Commission for Ecology and Environment of the Honourable Rosario City Council
- ❖ Secretariat of Public Service and Environment Dept. – Municipality of Rosario
- ❖ Director of Environment Dept. - Municipality of Rosario
- ❖ General Director of Environmental Policy - Municipality of Rosario
- ❖ Director of Waste Treatment Dept. - Municipality of Rosario
- ❖ Waste Treatment - Municipality of Rosario

The following authorities and personalities took part in the meeting:

- Director of INTI-CEMROS
- INTI-ROSARIO
- General Director of Environmental Policy - M.R.
- Management of Environmental Policy – M. R.
- General Coordinator of the South-West District -M.R.
- Public Service Secretariat- South-West District -M.R.
- Operation Manager/ LIME Technical Representative - Rosario

The project involved the following topics:

1. Environmental situation. Why should biogas be captured?
2. Benefits of a biogas plant
3. Clean Development Mechanism and Kyoto Protocol
4. Features of the proposer, company description
5. Project description
6. Landfill base data
7. Pictures of Italian plants
8. Advantages in treating biogas, management after the plant shutdown and social content of the project.

Many of those present had already taken part in the March 20th 2004 meeting about Urban Solid Waste and the effects of Climate Change which had been organized by INTI, by the Environment and Sustainable Development Secretariat of the Nation and by the JICA (Japan International Cooperation Agency).
Thanks to the high intellectual level and knowledge of environmental problems by those present in the conference hall - who played an active part in the presentation - the highest technical level ever seen in presentations to stakeholders was reached.
The survey carried out at the end of the presentation provided positive comments and answers and it didn't show any kind of disapproval of the project.

Do you think the project of recovery and treatment of the biogas produced in monitored landfills will favour the environment and sustainable development?

The whole public answered positively.

Do you think the project could be improved? How?

Most of the respondents said they had not enough information to give a comprehensive answer, except for one person who referred to the possibility of receiving fundings and another one who suggested to introduce steam-powered generators instead of internal combustion motors, thus using the remaining heat for heating purposes. Still another one suggested to produce electric power to be used within the district.

Did you know the possibilities offered by the Clean Development Mechanism included in the Kyoto Protocol?

Has this presentation given you a new knowledge about this kind of project?

The whole public answered positively, and they added that the presentation had been very interesting.

Report about the presentation to the inhabitants of the Gallego Landfill

The presentation of the project to stakeholders was held in the IT room which is placed in the area of influence of the "Puente Gallego" monitored landfills in the Municipality of Rosario.

Executives and people who are part of the local associations and live or work nearby the landfill were invited.
Personal invitation cards were sent according to the following model:

asja®.biz looking forward

TySA
UNA EMPRESA DE LA CORPORACION **IMPSA**

Mr/Ms:
c/o office

Mr/Ms or his/her representative is kindly invited to take part in the conference about biogas captation in the monitored landfills, the advantages for the environment and sustainable development – Application case: Monitored Landfill of Puente Gallego in the city of Rosario, by Asja Ambiente Italia SpA technicians. The conference will take place on July 21st at 5 p.m. in the branch of the company LIME in Anchorena 2750.

The representatives of the following cooperatives took part in the conference :

- Cooperative Tío Gallegos- President
- Cooperative Sargento Cabral - President
- Cooperative Unión Rosarina - President
- Cooperative Alvear – President

7 representatives of the above-mentioned organizations were present at the conference held on July 21st 2005. The participants profile is as follows: men and women between 25 and 50 with primary school degree and belonging to a low socio-economic level.

These people, despite their low education level, regularly take part to their community life with common sense and decision-making power.

As regards the project presentation, we have tried to explain the basic concepts about environment and pollution in order to define the effects our project may have within the community.

The project was set forth according to the following topics:

1. Environmental situation

2. Urban Solid Waste

3. Greenhouse gases and global warming
4. Susteinable development
5. Our Procedure
6. Team and Facilities (technical description)
7. Location
8. Benefits for the whole planet, Argentina and the district
9. Our Company (company description)

At the end of the conference, the 12 participants were asked the following questions. They answered positively favouring the project fulfilment.
None of the participants found good reasons to oppose the project fulfilment. On the contrary, they considered the benefits brought by the project to their own community as extremely favourable.

1. *Did this presentation allow you to know the environmental problems which are damaging the planet and your community?*

   Everybody answered “Yes”

2. *Do you think the project of recovery and treatment of the biogas produced in monitored landfills will favour the environment?*

   Everybody answered “Yes”

3. *Do you think that this project may offer a better life quality to your community?*

   Everybody answered “Yes”

4. *Do you think there are some reasons according to which this project should not be carried out?*

   Everybody answered “No”

Media coverage

Thanks to mass media which allowed the introduction of new technologies in the Rosario environmental policies, the Biogas Captation and Tratment project in the Puente Gallego landfill is mentioned in the main newspapers of the city.

http://archivo-elciudadano.com.ar/02-06-2005/ciudad/gas.php

El Ciudadano & la región

Gases will be obtained from waste

Rosario will be the first Argentinian city to profit from waste biocombustion in the monitored landfills of Puente Gallego I, II and III. More than 3 million pesos are expected to be invested.


The monitored landfills of Puente Gallego I, II and III will be used to extract biogas.

Rosario will become the first city in the country able to capture and treat gases released by the organic waste laid up in the monitored landfills Puente Gallego I, II and III. This task will lead to the temporary union of companies (UTE), i.e. the Italian company Asja Ambiente Italia SpA and the Industrie Metallurgiche Pescarmona (Impsa), who will invest 3,071,494 pesos in order to carry out the project.
The decision to use the biogas coming from the monitored landfill was made after the presentation of a private firm within the private initiative order no. 6209/96, which the executive body found particularly interesting from a local point of view. For this reason, they have called for tenders in order to award the contract in the Puente Gallego landfill.
The tender was called at the end of last year, on September 29th, and tomorrow the mayor Mr Miguel Lifschitz with the secretary of Public Service, Ms Clara García, are going to sign the contract with the UTE in the Carrasco room of the Palazzo dei Leoni. UTE, therefore, is carrying out the investment and crediting 2.01% of the total estimated as a guarantee for the period estimated to carry out the project.
UTE will be charged with treating gases produced by the organic waste decomposition in the monitored landfill, starting therefore to reduce the damage caused by methane – one of the biogas components – in the greenhouse effect.
The anaerobic degradation of organic waste causes different gases, and mainly methane, whose harmful effect is 21 times higher than that caused by, for example, carbon dioxide. In this way, the city of Rosario will keep its commitment of gases emissions reduction according to what was arranged by the UN Summit on Climate Change in Kyoto, Japan, in 1997.
The UN Framework Convention on Climate Change sets up “global reduction of greenhouse gases as its main target”. Among them, there are carbon dioxide, methane, nitrogen oxide and ozone.
The Framework Convention points out many advantages for those developing areas which could use certified emissions reductions in order to keep their commitment.
Therefore, an international market which trades off greenhouse gases reductions using CERs as a trade value – equal to one ton of greenhouse gases not released into the atmosphere – may be brought to life.
The contract to be signed expects that UTE will plant trees, carry out ecological recovery works, clean internal and external areas of the urban properties, and extract and treat soluble components as complementary performances.
Anyway, the temporary union of companies should take charge of the method of using biogas, show a detailed and complete diagram concerning the work scheduling, its implementation systems as well as the business and financial plan of the project.

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Diario “El Ciudadano”						Art newspaper