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Verification Report

Carbon Capital Markets

2nd Periodic Verification of the registered JI Track 2 Project

"Landfill Methane Capture and Flaring At Yalta and Alushta Landfills, Ukraine"

UNFCCC UA2000006/ JI050

Monitoring period 2: 01-04-2010 to 31-10-2011

Report No. **600500874**

06 February 2012

TÜV SÜD Industrie Service GmbH
Carbon Management Service
Westendstrasse 199 - 80686 Munich - GERMANY

Report No.	Date of first issue	Version No.:	Revision date	No. of pages
600500874	23.01.2012	2	06.02.2012	18
Subject:			2nd Verification under JI Track 2	
Executing Operational Unit:				
TÜV SÜD Industrie Service GmbH, Carbon Management Service Westendstrasse 199 - 80686 Munich, Federal Republic of Germany				
Project Participants :				
Carbon Capital Markets Ltd 22 Billiter Street EC3M 2RY London United Kingdom **Gafsa-Skhid LLC** Chapaeva Str. 17-A 36039 Poltava Ukraine				
Project Title			Project UA2000006/ JI050: "Landfill methane capture and flaring at Yalta and Alushta landfills, Ukraine"	
Monitoring period:			Period, in total from 01-04-2010 to 31-10-2011 with the following annual sub-periods: 1st sub- period: 01-04-2010 to 31-12-2010 2nd sub- period: 01-01-2011 to 31-10-2011	
First Monitoring Report (version/date)			Version 1 / 24-11-2011	
Final Monitoring Report (version/date)			Version 3 / 06/02/2012	

Summary:

TÜV SÜD Industrie Service GmbH has performed the 2nd Periodic Verification of the approved JI Track 2 project: "Landfill methane capture and flaring at Yalta and Alushta landfills, Ukraine".

The verification is based on requirements of the UN Framework Convention on Climate Change (UNFCCC) and the host country specific requirements. In this context, the relevant provisions set by the Marrakech Accords and the Kyoto Protocol; specific guidance provided by the JI-SC as well as by the Designated Focal Point (host country) has been taken into consideration.

A document review, followed by two site visits, was conducted to verify the information submitted by the project participant regarding the present verification period. Based on the assessment carried out, the verifier confirms the following:

- the project is fully implemented as described in the PDD regarding which the determination has been deemed final ;
- the monitoring has been carried out in accordance with the monitoring plan as included in the PDD regarding which the determination has been deemed final;
- the installed equipment essential for generating emission reductions runs reliably and the meters are calibrated appropriately; the project is generating emission reductions.
- the data collection system is in accordance with the monitoring plan.
- the calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner.
- the project was generating emission reductions.

The verifier can confirm that the GHG emission reductions for the entire monitoring period are calculated without material misstatements. Our opinion refers to the project GHG emissions and resulting GHG emission reductions reported, determined using the valid and determined project baseline, its monitoring plan and its associated documents.

Based on the information we have seen and evaluated, we confirm that the implementation of the project resulted in:

Verified emission in the above reporting period:

Sub- period	**Amount of ERs**
1st sub- period: 01-04-2010 to 31-12-2010	**33,145 t CO_{2e}**
2nd sub- period: 01-01-2011 to 31-10-2011	**29,818 t CO_{2e}**
Total from 01-04-2010 to 31-10-2011	**62,963 t CO_{2e}**

Assessment Team Leader: Olena Maslova **Assessment Team Members:** Dr. Albert Geiger	**Technical Reviewer:** Thomas Kleiser **Certification Body responsible:** Thomas Kleiser

Abbreviations

ACM	Approved Consolidated Methodology
AIE	Accredited Independent Entity
BM	Build Margin
CAR	Corrective Action Request
CM	Combined Margin
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
CO_{2e}	Carbon dioxide equivalent
CAR	Corrective action request
CR	Clarification Request
DFP	Designated Focal Point
EF	Emission Factor
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission Reduction
EUR	Emission Reduction Units
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse Gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IRL	Information Reference List
JI	Joint Implementation
KP	Kyoto Protocol
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-Governmental Organisation
OM	Operational Margin
PDD	Project Design Document
PP	Project Participant
QA/QC	Quality assurance/quality control
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	United Nations Framework Convention on Climate Change
DVM	Determination and Verification Manual

Main Documents (referred to in this report)

Methodology (name / version)	ACM0001, Version 05	
Scope	13	
Technical Area	13.1	
Approved PDD:	Version 08, dated 17-02-2009	
Revised Monitoring Plan:	N/A	
	Version	Date
Published Monitoring Report	1	24-11-2011
Revised Monitoring Report	3	06-02-2012
Project documentation link:	http://ji.unfccc.int/JIITLProject/DB/1FC65W96MRGI985P0SSYVODU119FSC/details	

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1 INTRODUCTION

1.1 Objective

Carbon Capital Markets Ltd. has commissioned an independent verification by TÜV SÜD Industrie Service GmbH (TÜV SÜD) of its determined JI Track 2 project:

"Landfill methane capture and flaring at Yalta and Alushta landfills, Ukraine"

Verification is the periodic independent review and ex-post determination by the Accredited Independent Entity (AIE) of the monitored reductions in GHG emissions during the defined verification period.

Periodic Verification:
The objective of the periodic verification is to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan for the respective period. Furthermore, the periodic verification evaluates the GHG emission reduction data and expresses a conclusion with a high, but not absolute, level of assurance about whether the reported GHG emission reduction data is free of material misstatements and verifies that the reported GHG emission data is sufficiently supported by evidence, i.e. monitoring records.

The verification shall consider both quantitative and qualitative information on emission reductions. Quantitative data comprises the monitoring reports submitted to the verifier by the project entity. Qualitative data comprises information on internal management controls, calculation procedures, and procedures for transfer, frequency of emissions reports, review and internal audit of calculations/data transfers.

The verification work ensures that the project activity is assessed against all applicable JI Track-2 requirements as well as specific host country requirements as specified by the Designated Focal Point (DFP) for JI/CDM project implementation in Ukraine. The JI requirements as reference include also the JI modalities and procedures and subsequent decisions by the COP/MOP and documents released by the JI-SC and available on the UNFCCC JI website http://ji.unfccc.int/index.html.

The objective of the verification work ensures that the project activity complies with the requirements as specified in the appendix B of the JI guidelines on the aforementioned UNFCCC JI website http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=2. These guidelines are considered valid for JI Track-2 as also for JI Track-1.

According to this assessment TÜV SÜD should:

- Ensure that the project activity has been implemented and operated as per the registered PDD and that all physical features (technology, project equipment, monitoring and metering equipment) of the project are in place;
- Ensure that the published MR and other supporting documents provided are complete and verifiable and in accordance with applicable JI Track-2 requirements;
- Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the applicable approved methodology;
- Evaluate the data recorded and stored as per the methodology of approved PDD;

- Evaluate the GHG emission reduction data and express a conclusion about whether the reported GHG emission reduction data is verifiable and sufficiently supported by evidence, i.e. monitoring records

1.2 Scope

The verification scope encompasses an independent and objective review and ex-post determination of the monitored reductions in GHG emissions by the Accredited Independent Entity.
This verification is based on the submitted monitoring report and the determination report. These documents are reviewed against the determined project design document including its monitoring plan, the requirements of the Kyoto Protocol, the JI Guidelines as well as related rules and guidance set by the CMP and JISC.

Determination Process and Final Approval
The determination of the project was carried out 2007 till 2009. The results of the determination were documented by TÜV SÜD in the Determination Report No. 988479, dated 15 June 2009. This final Determination Report indicates no remaining issues with relevance for the again subsequent verifications.

Following the relevant requirements of Article 6 of the Kyoto Protocol and the JI guidelines (refer to Appendix B of the JI guidelines, §§30-45 and to the national Ukrainian regulations and procedures) PP has applied a CDM approach. The principles of accuracy and completeness, relevance, reliability and credibility were combined with a conservative approach to establish a traceable and transparent verification opinion.

Past to receipt of the Monotoring Report referred to the para. 36 of the JI guidelines, a verification of the reductions in anthropogenic emissions by sources of greenhouse gases reported by project participants (PPs) in accordance with appendix B of the JI guidelines has been made showing that those reductions were monitored and calculated in accordance with para. 33 of the JI guidelines.

The project was finally approved by the JISC on 13 August 2009 and has the reference number UA2000006. Relevant associated documents are published on the UNFCCC weblink at http://ji.unfccc.int/JIITLProject/DB/1FC65W96MRGI985P0SSYVODU119FSC/details

Verification process
Based on the requirements in the DVM, TÜV SÜD has applied a rule-based approach for the verification of the project. The principles of accuracy, materiality, completeness, relevance, reliability and credibility were combined with a conservative approach to establish a traceable and transparent verification opinion.

The verification shall consider both quantitative and qualitative information on emission reductions. Quantitative data comprises the monitoring reports submitted to the AIE by the project entity. Qualitative data comprises information on internal management controls, calculation procedures, and procedures for transfer, frequency of emissions reports, review and internal audit of calculations/data transfers.

The verification is not meant to provide any consultancy towards the client. However, stated requests for clarifications and/or corrective actions as well as so-called forward action requests may provide input for improvement of the monitoring activities.

1.3 GHG Project Description

Project activity:	"Landfill methane capture and flaring at Yalta and Alushta landfills, Ukraine"
UNFCCC registration number:	UA2000006
Project Participants:	Gafsa-Skhid, Ukraine Carbon Capital Markets, UK
Location of the project:	Yalta and Alushta, Ukraine
Date of registration:	13-08-2009
Starting date of the crediting period:	01-06-2008

The purpose of this project is the avoidance of methane emissions into the atmosphere at the Yalta and Alushta landfills in the Ukraine by flaring the produced landfill gas. Furthermore, small amounts of methane are utilised by gas engine generators to provide electricity to the project activity.

The implementation status of the project in the verification period is as follows:

- Yalta landfill: Installation of the gas collection system with 1 flare and 1 gas engine generator
- Alushta landfill: Installation of the gas collection system with 1 flare and 1 gas engine generator

The Alushta landfill is still in operation. The Yalta landfill is closed for waste deposit.

2 METHODOLOGY

2.1 Verification Process

The verification process is based on the approach depicted in JI guidelines and, in particular, refer to the Guidance on Criteria for baseline setting and monitoring, chapter C. – Guidance on monitoring. Following the good monitoring practices and its reporting the approved Joint Implementation Determination and Verification Manual (JI DVM, especially chapter G. Verification) was taken into consideration.

Standard auditing techniques have been adopted for the verification process. The means of verification for the fulfilment of the requirements and reporting are as per the DVM.

The work starts with a contract review and the appointment of the TÜV SÜD assessment team covering the technical scope(s) and area(s) as well as relevant host country experience for evaluating of this JI project activity. The principles of consistency and transparency, impartiality, independency and safeguarding against conflicts of interest and confidentiality were considered by the TÜV SÜD Certification Body (CB) and the management of the departement before accepting the verification contract.

Once the monitoring report is published on the JISC web site, the TÜV SÜD assessment team has carried out a desk review, on-site inspection, follow-up actions, resolution of issues identified and prepared a verification report. The verification report and other supporting documents then undergo an internal quality control by the TÜV SÜD Certification Body before its submission to the JISC for the final approval.

In order to ensure transparency, assumptions are clearly and explicitly stated, audit evidences and further background material are clearly referenced in Annex 2 of this report. Project and methodology-specific checklists and a customized protocol have been developed for the project. The protocol shows criteria (requirements) in a transparent manner, the discussion of each criterion by the assessment team and results of the subsequent verification.

The verification protocol (Annex 1) serves the following purposes:

• It organizes details and clarifies the requirements a JI project is expected to meet;

• It ensures a transparent verification process where the verifier will document how a particular requirement has been proved and the conclusion provided by the verifying team.

The findings are the essential part of this verification report, which are summarized in Annex 1 of the verification protocol.

2.2 Verification Team

According to the technical scopes and experiences in the sectoral or national business environment TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV SÜD certification body "climate and energy". The composition of an assessment team has to be approved by the Certification Body (CB) ensuring that the required skills are covered by the team. The TÜV SÜD CB operates five qualification levels for team members that are assigned by formal appointment rules:

- Assessment Team Leader (ATL)
- Greenhouse Gas Auditor- Determiner (GHG Determiner)
- Greenhouse Gas Auditor- Verifier (GHG Verifier)
- Greenhouse Gas Auditor Trainee (T)
- Experts (E)

It is required that the sectoral scope and technical area - both are linked to the methodology - has to be covered by the assessment team. The verification team consisted of the following members:

Name	Qualification	Coverage of scope	Coverage of technical area	Host country experience
Mrs. Olena Maslova	**ATL**	☑		☑
Dr. Albert Geiger	GHG-VER	☑	☑	

Olena Maslova is an auditor (Determiner / Verifier) and assessment team leader in the "Carbon Management Service" department of TÜV SÜD Industrie Service GmbH in Munich, Germany. She is chemical engineer and host country expert for projects in Central and Eastern Europe. Due to her further master degree at the university of applied science in the Federal Republic of Germany she is also familiar with Germany's current environmental legislation. Olena Maslova specializes in the assessment of CDM / JI projects in the sector of chemical industries and waste handling and disposal.

Dr. Albert Geiger is a GHG verifier for CO_2-emission reduction projects of the scopes 8, 10 and 13 at the department "Environmental Service" of TÜV SÜD. He has done more than 15 CDM and JI projects and ho lds a PhD in geological sciences. He does environmental consulting in soil and water protection as well as waste management at TÜV SÜD since 1999.

Technical review: Thomas Kleiser

2.3 Review of Documents

The monitoring report submitted by the Client and additional background documents related to the project performance has been reviewed. The published Monitoring Report was assessed based on the PDD regarding which the determination has been deemed final, the applied methodology and monitoring plan. The main purpose of the assessment conducted was to verify the completeness and correctness of the data and the information presented in the monitoring report.

Monitoring Plan
The applied Monitoring Plan was assessed with special awareness against the Montioring Plan of registered PDD. The assessment included:

- A completeness check of the monitored parameters
- A check of the used monitoring meters including their accuracy and calibration procedures

Monitoring Report
A compliance check of the monitoring report with respect to the monitoring plan presented in the determined final PDD and the applied methodology was carried out.
Particular attention was paid to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures. In addition, the evaluation of data management and the quality assurance and quality control system was carried out in the context of their influence on the generation and reporting of emission reductions.
Moreover, a detailed review of the data transfer and recording procedures has been carried out on-site.

All key parameters had been focused with special awareness. All automatic raw data entry and a proper use of correct default data from external data sources had been proved.

The list of references and further documents reviewed within the verification is attached as Annex 2 to this report.

2.4 On-site Assessment and follow-up Interviews

TÜV SÜD performed a physical site inspection, the 13th till 15th December 2011, including on-site interviews with the project participants to:

- confirm the implementation and operation of the project,
- review the data flow for generating, aggregating and reporting of the monitoring parameters,
- confirm the correct implementation of procedures for operation and data collection,
- cross-check the information provided in the MR with other sources,
- check the monitoring equipment against the monitoring plan presented in the PDD and the applied methodology, including calibrations, maintenance, etc.,
- review the calculations and assumptions used to obtain the GHG data and ER,
- check if the QC/QA procedures are in place for preventing and correcting of errors or/and omissions in the reported data.
- Indentify whether the quality control and quality assurance procedures are in place to prevent or correct errors or omissions in the reported parameters.

A list of the persons interviewed during the verification activities is included in annex 2.

2.5 Quality of Evidence to Determine Emission Reductions

Among several evidences submitted, the following relevant and reliable evidence material has been used by the audit team during the verification process (see Annex 2):

- Licenses
- Raw data
- Handwritten Journals
- Analysis
- Calibration documents
- Specifications of the meters
- Quality assurance and quality control documents (Monitoring Manual)

Sufficient evidences and data covering the full verification period is available to validate the figures stated in the final MR. The source of the evidences and data will be discussed in chapter 3 of this report. The protocol gives a clear reference to sources assessed and is the basis for the conclusions of the audit team.
Specific cross-checks have been done in cases when further sources were available. The monitoring report figures were checked by the audit team against the raw data. It can be confirmed that no data transfer errors were detected.

2.6 Resolution of Clarification, Corrective Action and Forward Action Requests

The objective of this phase of the verification process is to resolve any outstanding issues, which require clarification for TÜV SÜD's conclusion on the reported GHG emission reduction. The findings raised as Forward Action Requests (FARs) (if any) indicated in previous reports (determination/verification) were discussed and resolved during this phase through communication between the PP and TÜV SÜD.
Concerns raised during the desk review, the on-site audit assessment and the follow up interviews are documented together with the according responses provided by the project participants in Annex 1 (verification protocols) to guarantee the transparency of the verification process.
A Corrective Action Request is raised where TÜV SÜD identifies:

- non-conformities in monitoring and/or reporting with the monitoring plan and/or methodology;
- that the evidence provided is not sufficient to prove conformity;
- mistakes in assumptions, data or calculations that impair the ER calculations;
- FARs raised during determination or previous verifications that are not solved until the on-site visit.

A Clarification Request is raised where TÜV SÜD does not have enough information or the information is not transparent in order to confirm a statement or data.
A Forward Action Request is raised where TÜV SÜD identifies that monitoring and/or reporting require special attention or adjustments for the next verification period.
Information or clarifications provided as a response to a CAR, CR or FAR can also lead to a new request.

2.7 Internal Quality Control

As a final step of verification, the final documentation including the verification report and annexes have to undergo an internal quality control by the Certification Body (CB) "climate and energy", i.e. each report has to be finally approved either by the Head of the CB or the Deputy (a technical reviewer can be used). In case one of these two persons is part of the assessment team, the approval can only be given by the person who is not a part of the assessment team.

If the documents have been satisfactorily approved, the Request for Issuance is submitted to the JISC along with the relevant documents.

3 VERIFICATION RESULTS

In the following sections, the results of the verification are stated. The verification results relate to the project performance as documented and described in the determined PDD and the final Monitoring Report. The verification findings for each verification subject are presented below.

3.1 FARs from Determination / Previous Verification

Following FAR has been presented in the previous verification report (1st periodic verification report) and solved with this verification.

Forward Action Request 1:

It is recommended to for the final excel calculation file to be improved by including e.g.a generic excel sheet with general information about the project and the calculations method, some exemplary sheets with raw data where the formulas behind the values can be seen and traced etc.. The calculation file should be presented to the assessment team at the second periodic verification.

The calculations of the 2nd monitoring period are transparently presented (IRL 6). Each calculation step is demonstrated and described. Hence, FAR 1 is solved.

3.2 Project Implementation in accordance with the registered Project Design Document

According to the visual inspections the following equipment has been installed on each site:

- Gas collection system (wells and manifolds)
- 1 Flare
- 1 gas engine generator
- 1 start-up generator (not used in the monitoring period)
- Monitoring and electronic data collection system

The gas collection system, the flares, the gas engine generators and the monitoring and electronic data collection system are implemented in accordance with the registered PDD. Instead of diesel a portable gasoline driven start-up generator has been implemented. This start-up generator was not used in the monitoring period.

TÜV SÜD confirms that:

- the gas collection system, the flares, the gas engine generators and the monitoring and electronic data collection system comply fully with the registered PDD.
- instead of diesel a portable gasoline driven start-up generator has been implemented.

3.3 Compliance of the Monitoring System with the Monitoring Plan

The monitoring meters have been implemented in fully accordance with the monitoring plan presented in the determined PDD (as published on UNFCCC JI website).

All parameters during the monitoring period were monitored and evaluated as per the Monitoring Plan. The parameters as included to the registered monitoring plan are considered to be complete.

The regulatory requirements are still met which has been confirmed by the relevant national authority (IRL 25).
A comprehensive list of each parameter required by the monitoring plan is provided in Annex 1. In this checklist all parameters are described in detail including source of data, verification of data, possible crosschecks, calibration of instruments etc.

The training plan and the participant lists clearly demonstrate that the staff has been trained regularly.

TÜV SÜD confirms that:

- the function of the monitoring equipment , including its calibration status, was in order within the whole verification period.
- the evidence and records used for the monitoring are maintained in a traceable manner (journals, electronic media)
- sufficient training has been conducted.

3.4 Assessment of Data and Calculation of Greenhouse Gas Emission Reductions

The client has provided the weekly reports with all montoring data (IRL 12). On the basis of these data the audit team conducted a detailed review of the Excel based calculations. The data presented in the MR as well as calculation files has been cross checked against the raw data. The cross check of the calculation file was done against the raw data presented in the weekly reports for the entire monitoring period. All automatic raw data entry and a proper use of correct default data from external data sources had been proved. The reported data have been cross-checked against other sources available as explained in Annex 1.

During the on-site cross-checks a few unplausible high methane concentration data (CH_4 > 55%) have been found. Consequently, the client developed an excel procedure eliminating all implausible data from the data sets (see CAR 1 and 3 below). All data sets have been processed and cleared up.

The verifier has examined the methods and formulae used to obtain the baseline, project and leakage emissions against the methods and formulae of the registered PDD. The same has been done with the methods and formulae described in the determined monitoring plan.

TÜV SÜD confirms that:

- Data sources used for calculating emission reductions are clearly identified, reliable and transparent
- the input data are viable and consistent with raw data.
- the used default values are clearly referenced and correctly cited.
- the methods and formulae used to obtain the baseline, project and leakage emissions are appropriate and without any mistakes or misstatements.
- that all assumptions, emission factors and default values (ex-ante values from PDD) are correctly justified and explicitly mentioned in the monitoring report.
- the calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner.

4 SUMMARY OF FINDINGS

The verifier can confirm that the published MR and related documents are complete and verifiable in accordance with the JI requirements. All the findings raised by the verification team, the responses by the PPs and the conclusion of the audit team are presented in Annex 1.
The means of verification and resulting changes in the MR or related documents are summarized in the table below:

Corrective Action Request No. 1
The data spot check showed implausibly high methane concentrations in the residual gas at Alushta landfill side, which could not be explained by maintenance or other daily events. The PPs are requested to treat that data taking into account conservative bias. Also refer to the FAR1.
CAR 1, means of verification
The revised Excel calculation sheet was reviewed by the assessment team and cross checked

with the raw data (IRL 12). The revised MR was reviewed by the assessment team.
CAR 1, changes in the MR or related documents
To provide the most accurate and conservative ERU Calculation procedure, the data treatment procedure has been upgraded by the PP introducing the CH4 LFG content benchmark (55%) into the Quality Factor. Consequently the assumption and method of assessment of a quality minute has been changed. As the result of the upgrade all minutes with CH4 LFG >55% were disqualified and treated as those that do not meet operational requirements. This upgrade of the ERU Calculation (quality factor assignment) Procedure has resulted in a slight change of the ERUs amount. The MR was revised reflecting the changes conducted in the Excel calculation sheet.
Corrective Action Request No. 2 Please include the information on calibration/replacement of thermocouples (for Yalta and Alushta sites) into the table 5.2 of the MR. In doing so please add the identification numbers of those thermocouples maintained/replaced/calibrated.
CAR 2, means of verification
The revised MR was assessmed by the auditors. The information on calibration/replacement of thermocouples (for Yalta and Alushta sites) provided in the table 5.2 of the revised PDD was cross-checked with the respective calibration protocols (IRL 20).
CAR 2, changes in the MR or related documents
The MR was revised and now provides information on calibration/replacement of thermocouples (for Yalta and Alushta sites) in complete manner.
Corrective Action Request No. 3: Please be aware that methane contents > 55 % are not plausible in landfill gas during continuous operation of the flare. Please remove these values from the data sets.
CAR 3, means of verification
See CAR 1
CAR 3, changes in the MR or related documents
See CAR 1
Revison of the MR.
Corrective Action Request No. 4: The table A.1.3 has to be corrected by including the correct figures in the last column "Emission reductions ERy".
CAR 4, means of verification
The assessment team reviewed the revised MR cross-checking the values presented in the table A.1.3 with those provided by the final version of the Excel calculation sheet. The values were found consistent throughout these documents.
CAR 4, changes in the MR or related documents
The table A.1.3 of the MR has been revised and now provides correct figures in the column "Emission reductions ERy".
Clarification Request No. 1: When assessing the weekly reports the audit team noticed that there were several stops in flare operation resulting in very low or zero emission reductions. Even though the reasons were clarified to the assessment team and found to be plausible, they have to be reported in the MR, e.g. after the table A.1.1 in order to clarify low or no emission reductions in November 2010- February 2011 (Alushta) and January-March 2011 (Yalta).
CL 1, means of verification
The assessment team reviewed the revised MR. The explanation provided for the low ERs figures is plausible and consistent with the one provided to the auditors by the weekly reports

and interviews on-site.
CL 1, changes in the MR or related documents
The MR has been revised and now provides clear explanation for the low amounts of emission reductions achieved at Yalta annd Alushta landfill sites during the specific months of the current monitoring period.
Clarification Request No. 2: The MR, e.g. chapter 4, has to be amended by including a comparison of achieved emission reductions and the estimates presented in the registered PDD. Any significant difference has to be explained.
CL2, means of verification
The revised MR was reviewed by the audit team. The Annex 1 table A.1.4 provides a clear analysis of the emission reductions by comparing the emission reduction achieved to the estimates presented in the registered PDD. The difference is explained transparently on page 19 of the revised MR.
CL 2, changes in the MR or related documents
The MR has been revised and now demonstrates a clear analysis of the emission reductions by comparing the emission reduction achieved to the estimates presented in the registered PDD. The explanation of any difference has been included on page 19 of the revised MR.
Forward Action Request No 1: It is recommended to report the minimum and maximum flow values on the weekly basis. The values above the normal cumulative capacity have to be justified and processed conservatively.
FAR 1, means of verification
Will be verified at the next verification.
FAR 1, changes in the MR or related documents
Will be verified at the next verification.
Forward Action Request No 2: It is recommended to control also the maximum and minimum methane concentration on a weekly basis in order to immediately recognize the implausible data and take appropriate action in case of any equipment failure.
FAR 2, means of verification
Will be verified at the next verification.
FAR 2, changes in the MR or related documents
Will be verified at the next verification.

5 VERIFICATION STATEMENT

TÜV SÜD Industrie Service GmbH has performed the 2nd Periodic Verification of the approved JI Track 2 project : "Landfill methane capture and flaring at Yalta and Alushta landfills, Ukraine".

The verification is based on requirements of the UN Framework Convention on Climate Change (UNFCCC) and the host country specific requirements. In this context, the relevant provisions set by the Marrakech Accords and the Kyoto Protocol; specific guidance provided by the JI-SC as well as by the Designated Focal Point (host country) has been taken into consideration.

A document review, followed by a site visit, was conducted to verify the information submitted by the project participant regarding the present verification period. Based on the assessment carried out, the verifier confirms the following:

- the project is fully implemented as described in the PDD regarding which the determination has been deemed final ;
- the monitoring has been carried out in accordance with the monitoring plan as included in the PDD regarding which the determination has been deemed final;
- the installed equipment essential for generating emission reductions runs reliably and the meters are calibrated appropriately.
- the calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner.
- the project was generating emission reductions.

The verifier can confirm that the GHG emission reductions for the entire monitoring period are calculated without material misstatements. Our opinion refers to the project GHG emissions and resulting GHG emission reductions reported, determined using the valid and determined project baseline, its monitoring plan and its associated documents.
Based on the information we have seen and evaluated, we confirm that the implementation of the project resulted in:

Verified emission in the above reporting period:

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Munich, 06-02-2012

Thomas Kleiser
Certification Body "climate and energy"
TÜV SÜD Industrie Service GmbH

Munich, 06-02-2012

Olena Maslova
Assessment Team Leader

Annex 1: TÜV SÜD Verification Protocol

Verification Protocol

Project Title: 2nd periodic Verification of the JI project “Landfill methane capture and flaring at Yalta and Alushta landfills”

Number of Pages: 78

Industrie Service

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1. Project Activity Implementation

1.1. Project Approval by Parties involved

	Verified Situation	Conclusion and IRL
Approvals at the determination stage	Host Party- Ukraine; Other Party involved- United Kingdom of Great Britain and Northern Ireland. The DFP of the Party involved, other than the host Party, issued an unconditional written project approval when submitting the final determination to the JI-SC.	☑
Approvals at the verification	See above. No further parties, other than those issued their unconditional written project approvals at the determination stage, are involved in this project activity.	☑

1.2. Technology

Location (s)			
	PDD Description	Verified Situation	Conclusion and IRL
Description / Address:	Landfills of Yalta and Alushta towns, Autonomous Republic of Crimea, Ukraine	Compliant.	☑
GSP coordinates:	Yalta landfill- 44º27'01''N and 34º06'323''E; Alushta Landfill- 44º43'18''N and 34º26'06''E.	GSP coordinates are correct, which was confirmed during the on-site verification.	☑
Technical Equipment – Main Components			
	PDD Description	Verified Situation	Conclusion and IRL
Equipment Description	The project boundaries for each project site comprise	The TÜV SÜD assessment team can confirm that following components are exist-	☑

	1. Landfill gas production incl. remediation 2. Landfill gas collection system 3. Flaring plant 4. Electricity generation (for on-site use only) 5. Control panel on the flaring device 6. Operator's room (only Alushta)	ing at Yalta and Alushta landfills within the project boundary: 1. Landfill gas production incl. remediation 2. Landfill gas collection system 3. Flaring plant 4. Electricity generation (for on-site use only) 5. Control panel on the flaring device 6. Operator's room (only at Alushta site)	
Component 1: Landfill gas collection system Technical Features	The main elements of LFG collection system are listed below: - vertical gas extraction wells with regulation valves and connection units for monitoring of gas composition; - gas transport pipes, transporting gas from the wells to the integrated gas boosting and flaring plant; and - condensate shafts. LFG flows from the wells through the lateral and sub-header piping to the header piping to the gas control plant. The flow of gas can be controlled at each of the individual vertical extraction wells through the use of a valve located at the top of the well piping. Each well will be individually controlled to ensure that the collection systems can be effectively set up and balanced. The systems will be manually	1. the amount of the vertical gas extraction wells is 30 (at Alushta landfill site) and 56 (at Yalta landfill site). Serial numbers of vertical wells are C1- C30 (Alushta) and H1- H56 (Yalta). 2. LFG capacity of the units installed are the following (acc. to the manufacturer's specifications): 500m3/h (Alushta), 800 m3/h (Yalta). 3. Manufacturer: done by Gafsa company which is project participant of the project. 4. Commissioning date: November 2007 (Alushta), March 2008 (Yalta). 5. there are 4 gas collectors at Alushta landfill (K1-K4) and 5 at Yalta site (K1-K5). K6 has been removed due to recultivation of the	☑

	monitored and controlled and each well-head will be equipped with a secure monitoring chamber and monitoring ports for gas composition, pressure, and temperature readings. Non-perforated LFG collection piping will be utilized to convey the LFG from the extraction wells to the gas control plant at the landfills.	landfill site.	
Component 2: Flaring plant Technical Features	The flaring plant consists mainly of the following components: manifold for the incoming pipes, flow control valves, gas pressure boosting pumps, enclosed high-temperature flare stack, gas monitoring and analysis system.	During the on-site inspections following information on technical specification of the flaring plant has been verified: On each landfill site one flare unit is installed. The capacity of the flare at Alushta landfill is 500 m^3/h, at the Yalta site 800 m^3/h. Manufacturer of the both installed flaring devices is the Hofstetter company, the types are: - Alushta; Hofstetter degassing unit HOFGAS- Ready 500, serial number 10129. - Yalta: Hofstetter degassing unit HOFGAS- Ready 800, serial number: 10128. There is 1 blower at each site. Serial numbers of them are: 11081976 (Alushta blower) 11081964 (Yalta blower)	☑
Component 3: Electricity generation (for on-site use only) Technical Features	Electricity generation (for on-site use only) consists of: - Gas engine generator: used to	During the on-site assessments it was verified that both landfills are equipped each with the gas engine generator gene-	☑

	supply the project activity with power - Start-up diesel generator: used to start up the whole project system	rating electricity for on-site use only, and with the start-up small generator which was used only until April 2009. At the Alushta site the capacity of the engine generator fed with LFG is 60 kW, manufacturer is Ukrainian company "Juzhnyj meredian". At the Yalta site a similar engine generator with capacity of 60 kW from the manufacturer "Juzhnyj meredian" is installed. Serial number of the generator in Alushta is 20072249. Serial number of the engine generator installed at Yalta site is 20072248.	
Component 4: Control panel Technical Features	PDD: control panel: houses all of the flare controls, motor starters, alarms and interlocks that ensure safe operation of the flare.	During the on-site visits the flaring plants at the both sites have been visited by the assessment team. It was verified that each Hofstetter flaring plant includes a control panel with all the parameter measured: - Concentration of CH4, CO2 and O2, - operating hours, - temperature and pressure, - on/off signal	☑
Operation Status during verification			
	Verified Situation		Conclusion and IRL
Approvals / Licenses	At the on-site verification the contracts with municipality of Yalta and Alushta towns were provided to the assessment team. It was verified that the contract between the		☑

	project participant Gafsa- Skhid and municipality of Alushta town is valid until 2020, and between Gafsa- Skhid and Yalta's municipality is valid as long as the project exists at the site.	IRL 22, 23 Licences
Actual Operation Status	Start date of operation (each site if applicable): Yalta: 30/11/2008, Alushta 07/09/2008 Under construction ☐ In operation ☒ Out of operation ☐ Reason and date (if out of operation): n/a	☑
	Changes in the project design (other than any revision of the Monitoring Plan): no changes occurred.	☑
	Status of the project implementation: the project is fully operational acc. to the registered PDD. Status of the project operation: in operating as per the Monitoring Plan included in the registered PDD.	☑
Remarks to Special Operational Status During the Verification Period	Phased implementation: n/a Special cases: n/a	☑

1.3. Organization

Project Participant (s)		
	Verified Situation	Conclusion and IRL
Entity / Responsible person:	PDD: Gafsa-Skhid/ Mr. Anatoliy M. Kurbala (Ukraine) and Carbon Capital Markets Ltd/ Ms. Joy Williams (UK) The responsible representative and therefore the contact details of the focal point to the JISC- Carbon Capital Markets Limited- have changed. Because of this, the up-	☑

	dated MoC has been provided by the project participants and was submitted to the JISC on February 9th, 2011. The current sharing of responsibilities is transparently described in the monitoring report.	
JI Project management:	QA/QC Manager (CCM), JI Monitoring Manager (Gafsa), Site Managers Yalta/ Alushta (Gafsa), Degassing System Service Team Yalta/ Alushta, Operational safety (Gafsa).	☑

1.4. Quality Management System

General aspects of the Quality Management System		
	Verified Situation	Conclusion and IRL
Quality Management Manual:	QM procedures are described in the Monitoring Protocol.	☑ IRL 7
Responsibilities:	The responsibilities are clearly shown in a flow chart in chapter 2.3. The given information clearly complies with the on-site findings.	☑
Qualification and Training:	According to the internal procedures and training records shown during the periodic verification the TÜV SÜD assessment team confirms that the work has been done by people with the appropriate competences and qualifications.	☑ IRL 13 List of trained personnel
Implementation of QM-system	The verifier confirms the accessibility of documents of the QM-system and the proper implementation of the procedures.	☑ IRL 14 (working instructions)

1.5. Outstanding FARs from the previous verifications (or forwarded issues of determination report)

Forward Action Requests by audit team			
	Comments and Results	Ref	Conclusion and IRL
Issue	**Forward Action Request No. 1** It is recommended to for the final excel calculation file to be improved by including e.g.a generic excel sheet with general information about the project and the calculations method, some exemplary sheets with raw data where the formulas behind the values can be seen and traced etc. The calculation file should be presented to the assessment team at the second periodic verification.		☑
Response	To the most reasonable extent the request has been satisfied at the 1st Periodic Verification via 1) a considerable upgrade of the ERU Calculation Procedure and 2) provision of a complete and traceable summary of the weekly, monthly, and annual values of the Emission Reductions. The weekly ER calculation files provide a very transparent calculation procedure with a clear identification of the applicable calculations steps (in acc. to the Tool), parameters, formulas, and constants used. The clarity and conservativeness of the ER calculation procedure has been sustained and even improved (See the Response to the CAR#1) for the 2nd Periodic Verification. The transparency and accuracy of the calculation procedure has been checked by the audit team. However, as the ER calculation files constitute intellectual property of one of the Project Participants, **disclosure** of a part or the whole content of any ER calculation files to any 3rd party except of the verifier, who needs to treat that information as strictly confidential, **is strictly prohibited**.		
Assessment	The calculations of the 2nd monitoring period are transparently presented. Each calculation step is demonstrated and described. Hence, FAR 1 is solved.		

2. Monitoring Plan Implementation

2.1. Parameters

Methodology applied and Monitoring Plan included in the final PDD					
Methodological approach indicated in the PDD regarding which the determination has been deemed final	JI specific approach ☐ Approved CDM methodology in its totality ☒				
Revision of the Monitoring Plan	Yes ☐ No ☒				
Parameters Methodology ACM0001					
Meth/tool	PDD	MR	Included in table	Compliance	Conclu-sion and IRL
$LFG_{total,y}$ Total amount of landfill gas captured	$LFG_{total,y}$ Amount of landfill gas captured	$LFG_{total,h}$ Volumetric flow rate of residual gas in dry basis at normal conditions at inlet to the flare in hour h	Table 1a Yalta and Table 1b Alushta	Because all the gas is flared or treated as flared $LFG_{total,y} = LFG_{flared,y}$ (obtained from $FV_{RG,y}$).	☑
$LFG_{flare,y}$ Amount of landfill gas flared	$LFG_{flared,y}$ Amount of landfill gas flared	See $LFG_{total,y}$ above	See $LFG_{total,y}$ above	See $LFG_{total,y}$ above	☑

$LFG_{electricity,y}$, Amount of landfill gas combusted in power plant	n/a	n/a	n/a	n/a	☑
$PE_{flare,y}$	$PE_{flare,y}$ Project emissions from flaring of the resid-ual gas stream in year y	$PE_{flare,y}$	Calculated Parameter not included in tables below	Compliant	☑
W_{CH4} Methane fraction in the landfill gas	W_{CH4}	W_{CH4}	Tables 3a Yalta and 3b Alushta.	Monitoring system on-site complies with the Monitoring plan described in the registered PDD.	☑
T Temperature of the landfill gas	T LFG tem-perature	T Temperature of the landfill gas	Table 6a Yalta and 6b Alushta	Monitoring system on-site complies with the Monitoring plan described in the registered PDD.	☑
P Pressure of the landfill gas	P LFG pres-sure	P Pressure of the landfill gas	Table 7a Yalta and 7b Alushta	Monitoring system on-site complies with the Monitoring plan described in the registered PDD.	☑
$EL_{EX,LFG}$	n/a	n/a	n/a	n/a	☑
EL_{IMP}	n/a	n/a	n/a	n/a	☑

Total amount of electricity imported to meet project requirement					
CO_2 emission intensity of the electricity and/or other energy carriers	n/a	n/a	n/a	n/a	☑
ET_y Thermal energy used in landfill during project	ET_y Thermal energy used in landfill during project	ET_y Amount of fossil fuel used by on-site diesel generator to meet project requirement	Table 10a Yalta and 10b Alushta	n/a Refer to the tables 10a and 10b.	☑
$CEF_{thermal,y}$ CO_2 emission intensity of the thermal energy	$CEF_{thermal}$ CO_2 emission intensity of the thermal energy	$CEF_{thermal, y}$ CO2 emission intensity of the thermal energy	Table 11a Yalta and 11b Alushta	n/a Refer to the tables 11a and 11b.	☑
Regulatory requirements relating to landfill gas projects	Regulatory requirements relating to landfill gas projects	Regulatory requirements for LFG projects	Chapter 4.3	Compliant.	☑ IRL 25
Operation of	*h*	**h**	Table 9a Yalta and 9b Alushta	Monitoring system on-site complies with	☑

the energy plant	Operation of the energy plant	Operating hours of the energy plant		the Monitoring plan described in the registered PDD.	
Meth/tool	PDD	MR	Included in table	Compliance	
$fv_{i,h}$	n/a	n/a	n/a	n/a	☑
$FV_{RG,h}$ Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h	$FV_{RG,h}$	$FV_{RG,h}$	Tables 1a Yalta and 1b Alushta.	Serves for obtaining $LFG_{total,y}$.	☑
$t_{O2,h}$ Volumetric fraction of O2 in the exhaust gas of the flare in the hour h	n/a	n/a	Tables 2a Yalta and 2b Alushta.	Since the default approach for the flare efficiency is applied in the relevant monitoring period (pls. refer to the flaring tool step 6 and the MP in the registered PDD) this parameter is not applicable.	☑
$fv_{CH4,FG,h}$ Volumetric fraction of methane in	W_{O2ex} W_{CH4ex} Measure volumetric fraction of	**$fv_{CH4,FG,h}$**	Tables 2a Yalta and 2b Alushta.	Since the default approach for the flare efficiency is applied in the relevant monitoring period (pls. refer to the flaring tool step 6 and the MP in the registered PDD) this parameter is not appli-	☑

the exhaust gas of the flare in dry basis at normal conditions	O_2 and CH_4 in the exhaust gas			cable.	
n/a	T_{ex}	n/a	Table 4a Yalta and 4b Alushta	n/a Refer to the tables 5a and 5b.	☑
T_{flare} Temperature of the exhaust gas of the enclosed flare	T_{flare} Temperature of the exhaust gas of the enclosed flare	**T_{flare}** Temperature of the exhaust gas of the enclosed flare	Table 5a Yalta and 5b Alushta	Monitoring system on-site complies with the Monitoring plan described in the registered PDD.	☑
Other flare operation parameters	Other flare operation parameters according to the Annex 13 EB28	Other flare operation parameters	Table 8a Yalta and 8b Alushta	Monitoring system on-site complies with the Monitoring plan described in the registered PDD.	☑

2.2. Parameters measured directly with instruments

Table 1a Yalta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	$LFG_{total,y}$ = $LFG_{flared,y}$ (obtained from $FV_{RG,y}$)	$LFG_{total,y}$ = $LFG_{flared,y}$ (obtained from	$LFG_{total,y}$ = $LFG_{flared,y}$ (obtained from	Compliant.	☑

		$FV_{RG,y}$)	$FV_{RG,y}$)		
Parameter ID (if available)	n/a	n/a	n/a	Compliant.	☑
Data Unit	m^3	m^3	m^3	Compliant.	☑
Monitoring frequency (reading)	continuous	continuously	Continuously (average minutes values)	Compliant.	☑
Monitoring frequency (recording)	Data to be aggregated monthly or yearly	Data to be aggregated monthly or yearly	Data is aggregated weekly	Compliant.	☑
Calibration requirements	according to the manufacturer's recommendation	n/a	Once every 2 years the last calibrations were conducted on 22.01.10	Compliant.	☑ IRL 18
Uncertainty level	Low	Low	PPs information: 1% according to the manufacturer's specifications	Compliant.	☑
Measurement Principle (if applicable)	Flow meter	Flow meter	Flow meter (turbine)	Compliant.	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Flow meter with P and T compensation				☑
Serial Number:	10510655				☑

Manufacturer Model Nr.:	Elster- Instromet AG SM-RI-X-K/150/G650	☑
Specific Location:	pipe after blower	☑
Measurement Range:	Flow: 50..1000 m3/h; T: -50..100 C; P: 0,5..2,5 bar	☑
Gaps in operating time of instrument :	Data were reviewed showing its completeness and credibility. Any gaps are described in the registry log, justified in the weekly report and taken into account when calculating the emission reductions.	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Data is collected electronically by the data recording unit PLC at 1 minute intervals.	☑
	Procedure: is described in the Monitoring Protocol.	☑
	Implementation of procedure: the procedure is fully implemented.	☑
	Responsibility: see section 1.3. "Responsibilities"	☑
Archiving of raw data and protection measures	Weekly data collection is done by responsible JI manager. Data archiving is performed by JI manager on his PC, too, and then on CDs as back-up. Furthermore a converted excel file comprising all the data collected is sent to the project participants (Gafsa and CMM) on weekly basis.	☑
Data transfer and protection of input data for calculations	The raw data is extracted with help of software ReadWin on the JI manager's PC from the flash card of control panel on weekly basis, after that the file is converted to the excel table and stored on the JI Manager's PC and CDs. Furthermore such tables are sent to all the PPs on weekly basis.	☑
	Quality of evidence	Conclusion and IRL

Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑
Data verification	Consistency of raw data with calculation tool: The consistency has been spot checked on a random basis. No inconsistencies have been found.	☑
	Consistency of calculation tool with monitoring report: n/a as the data is not presented in the MR.	☑
Crosscheck (if available)	n/a	☑

Table 1b Alushta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	$LFG_{total,y}$ = $LFG_{flared,y}$ (obtained from $FV_{RG,y}$)	$LFG_{total,y}$ = $LFG_{flared,y}$ (obtained from $FV_{RG,y}$)	$LFG_{total,y}$ = $LFG_{flared,y}$ (obtained from $FV_{RG,y}$)	Compliant.	☑
Parameter ID (if available)	n/a	n/a	n/a	Compliant.	☑
Data Unit	m^3	m^3	m^3	Compliant.	☑
Monitoring frequency (reading)	continuous	continuously	Continuously (average minutes values)	Compliant.	☑
Monitoring frequency (recording)	Data to be aggregated monthly or yearly	Data to be aggregated monthly or	Data is aggregated weekly	Compliant.	☑

		yearly			
Calibration requirements	according to the manufacturer's recommendation	n/a	Once every 2 years The last calibration has been conducted on 22.01.10	Compliant.	☑ IRL 17
Uncertainty level	Low	Low	PPs information: 1% according to the manufacturer's specifications	Compliant.	☑
Measurement Principle (if applicable)	Flow meter	Flow meter	Flow meter (turbine)	Compliant.	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Flow meter with P and T compensation				☑
Serial Number:	10510656				☑
Manufacturer Model Nr.:	Elster- Instromet AG SM-RI-X-K/150/G650				☑
Specific Location:	160 inlet pipe after the blower.				☑
Measurement Range:	Flow: 50..1000 m3/h; T: -50..100°C; P: 0,5..2,5 bar				☑
Gaps in operating time of instrument :	Data were reviewed showing its completeness and credibility. Any gaps are described in the registry log, justified in the weekly report and taken into account when calculating the emission reductions.				☑
	Default value used: n/a				☑

	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Data is collected electronically by the PLC unit at 1 minute intervals.	☑
	Procedure: is described in the Monitoring Protocol.	☑
	Implementation of procedure: the procedure is fully implemented.	☑
	Responsibility: see section 1.3. "Responsibilities"	☑
Archiving of raw data and protection measures	Weekly data collection is done by responsible JI manager. Data archiving is performed by JI manager on his PC, too, and then on CDs as back-up. Furthermore a converted excel file comprising all the data collected is sent to the project participants (Gafsa and CMM) on weekly basis. See also comments to the section 1.3. "Responsibilities"	☑
Data transfer and protection of input data for calculations	The raw data is extracted with help of software ReadWin on the JI manager's PC from the flash card of control panel on weekly basis, after that the file is converted to the excel table and stored on the JI Manager's PC and CDs. Furthermore such tables are sent to all the PPs on weekly basis.	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑
Data verification	Consistency of raw data with calculation tool: The consistency has been spot checked on a random basis. No inconsistencies have been found.	☑

	Consistency of calculation tool with monitoring report: n/a as the data is not presented in the MR.	☑
Crosscheck (if available)	n/a	☑

Table 2a Yalta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	Measure volumetric fraction of O2 and CH4 in the exhaust gas	**$fv_{CH4,FG,h}$** Volumetric fraction of methane in the exhaust gas of the flare in dry basis at normal conditions in the hour h **$t_{O2,h}$** Volumetric fraction of O2 in the exhaust gas of the flare in the hour h	$fv_{CH4,FG,h}$ $t_{O2,h}$	Since the default approach for the flare efficiency is applied in the relevant monitoring period (pls. refer to the flaring tool step 6 and the MP in the registered PDD) these parameters are not applicable.	☑
Parameter ID (if available)	W_{O2ex} W_{CH4ex}	**$fv_{CH4,FG,h}$** **$t_{O2,h}$**	$fv_{CH4,FG,h}$ $t_{O2,h}$	n/a	☑
Data Unit	%	mg/m³ -	%	n/a	☑

Monitoring frequency (reading)	Measured by continuous gas analyser	Preferably measured by continuous gas analyser	Continuously	n/a	☑
Monitoring frequency (recording)	Continuously. Values to be averaged hourly or at a shorter time interval	Continuously. Values to be averaged hourly or at a shorter time interval	Average minute values	n/a	☑
Calibration requirements	n.a.	n.a.	Weekly according to the technology provider's recommendations.	n/a	☑
Uncertainty level	Low	Low		n/a	☑
Measurement Principle (if applicable)	Flue gas analyser	n.a.		n/a	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Flue Gas Analyser				☑
Serial Number:	4006.41-1				☑
Manufacturer Model Nr.:	Rosemount BINOS 100 NUK				☑
Specific Location:	Flare outlet measurement				☑
Measurement Range:	0..100 Vol%				☑
Gaps in operating time of instrument :	Period: n/a				☑
	Default value used: n/a				☑

	Justification: since depending on the exhaust gas temperature the flaring efficiency default values of 90, 50 and 0 % were used acc. to the flaring tool and MP of the registered PDD.	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Data is collected electronically by the data recording unit 'PLC' at 1 minute intervals.	☑
	Procedure: is described in the Monitoring Protocol.	☑
	Implementation of procedure: n/a	☑
	Responsibility: n/a	☑
Archiving of raw data and protection measures	Weekly data collection is done by responsible JI manager. Data archiving is performed by JI manager on his PC, too, and then on CDs as back-up. Furthermore a converted excel file comprising all the data collected is sent to the project participants (Gafsa and CMM) on weekly basis.	☑
Data transfer and protection of input data for calculations	The raw data is extracted with help of software ReadWin on the JI manager's PC from the flash card of control panel on weekly basis, after that the file is converted to the excel table and stored on the JI Manager's PC and CDs. Furthermore such tables are sent to all the PPs on weekly basis.	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	n/a	☑
Data verification	Consistency of raw data with calculation tool: n/a	☑

	Consistency of calculation tool with monitoring report: n/a	☑
Crosscheck (if available)	n/a	☑

Table 2b Alushta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	Measure volumetric fraction of O2 and CH4 in the exhaust gas	$fv_{CH4,FG,h}$ Volumetric fraction of methane in the exhaust gas of the flare in dry basis at normal conditions in the hour h $t_{O2,h}$ Volumetric fraction of O2 in the exhaust gas of the flare in the hour h	$fv_{CH4,FG,h}$ $t_{O2,h}$	Since the default approach for the flare efficiency is applied in the relevant monitoring period (pls. refer to the flaring tool step 6 and the MP in the registered PDD) these parameters are not applicable.	☑
Parameter ID (if available)	W_{O2ex} W_{CH4ex}	$fv_{CH4,FG,h}$ $t_{O2,h}$	$fv_{CH4,FG,h}$ $t_{O2,h}$	n/a	☑
Data Unit	%	mg/m³ -	%	n/a	☑
Monitoring frequency (reading)	Measured by con-	Preferably meas-	Continuously	n/a	☑

	tinuous gas analyser	ured by continuous gas analyser			
Monitoring frequency (recording)	Continuously. Values to be averaged hourly or at a shorter time interval	Continuously. Values to be averaged hourly or at a shorter time interval	Average minute values	n/a	☑
Calibration requirements	n.a.	n.a.	Weekly according to the technology provider's recommendations.	n/a	☑
Uncertainty level	Low	Low		n/a	☑
Measurement Principle (if applicable)	Flue gas analyser	n.a.	n/a	n/a	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Flue Gas Analyser				☑
Serial Number:	4006.63				☑
Manufacturer Model Nr.:	Rosemount BINOS 100 NUK				☑
Specific Location:	Flare outlet measurement Insert				☑
Measurement Range:	0..100 Vol%				☑
Gaps in operating time of instrument :	Period: n/a				☑
	Default value used: n/a				☑
	Justification: since depending on the exhaust gas temperature the flaring efficiency default values of 90, 50 and 0 % were used acc. to the flaring tool and MP of the registered PDD.				☑

	QA/QC aspects	Conclusion and IRL
Source of data	Data is collected electronically by the data recording unit 'PLC' at 1 minute intervals.	☑
	Procedure: is described in the Monitoring Protocol.	☑
	Implementation of procedure: n/a	☑
	Responsibility: n/a	☑
Archiving of raw data and protection measures	Weekly data collection is done by responsible JI manager. Data archiving is performed by JI manager on his PC, too, and then on CDs as back-up. Furthermore a converted excel file comprising all the data collected is sent to the project participants (Gafsa and CMM) on weekly basis.	☑
Data transfer and protection of input data for calculations	The raw data is extracted with help of software ReadWin on the JI manager's PC from the flash card of control panel on weekly basis, after that the file is converted to the excel table and stored on the JI Manager's PC and CDs. Furthermore such tables are sent to all the PPs on weekly basis.	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	n/a	☑
Data verification	Consistency of raw data with calculation tool: n/a	☑
	Consistency of calculation tool with monitoring report: n/a	☑
Crosscheck (if available)	n/a	☑

Table 3a Yalta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	W_{CH4}	W_{CH4}	W_{CH4}	Compliant.	☑
Parameter ID (if available)	n/a	n/a	n/a	Compliant.	☑
Data Unit	%	%	%	Compliant.	☑
Monitoring frequency (reading)	Measured by continuous gas quality analyser	Measured by continuous gas quality analyser	Measured by continuous gas quality analyser	Compliant.	☑
Monitoring frequency (recording)	continuous	continuous	continuous	Compliant.	☑
Calibration requirements	calibrated according to the manufacturer's recommendation	calibrated according to the manufacturer's recommendation	Weekly calibrations as recommended by the manufacturer	Compliant.	☑
Uncertainty level	Low	Low	CH_4: 2% CO_2: 2% O_2: 10%	Compliant.	☑
Measurement Principle (if applicable)	Flue gas analyser	n.a.	NDIR	Compliant.	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Gas Analyser				☑
Serial Number:	4006.32/2				☑
Manufacturer Model Nr.:	NUK NGA 5- CH4-CO2-O2				☑

Specific Location:	System inlet measurement	☑
Measurement Range:	CH4 and CO2: 0..100% O2: 0..25%	☑
Gaps in operating time of instrument :	Data were reviewed showing its completeness and credibility. Any gaps are described in the registry log, justified in the weekly report and taken into account when calculating the emission reductions.	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Data is collected electronically by the data recording unit 'PLC' at 1 minute intervals. Type: analog data 4-20mA	☑
	Procedure: is described in the Monitoring Protocol.	☑
	Implementation of procedure: implemented	☑
	Responsibility: see MR	☑
Archiving of raw data and protection measures	Weekly data collection is done by responsible JI manager. Data archiving is performed by JI manager on his PC, too, and then on CDs as back-up. Furthermore a converted excel file comprising all the data collected is sent to the project participants (Gafsa and CMM) on weekly basis.	☑
Data transfer and protection of input data for calculations	The raw data is extracted with help of software ReadWin on the JI manager's PC from the flash card of control panel on weekly basis, after that the file is converted to the excel table and stored on the JI Manager's PC and CDs. Furthermore such tables are sent to all the PPs on weekly basis.	☑
	Quality of evidence	Conclusion and IRL

Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑
Data verification	Consistency of raw data with calculation tool: **Corrective Action Request No 1:** The data spot check showed implausibly high methane concentrations in the residual gas, which could not be explained by maintenance or other daily events. The PPs are requested to treat that data taking into account conservative bias. Also refer to the FAR1.	**CAR 1**
	Consistency of calculation tool with monitoring report: n/a as the data is not presented in the MR.	☑
Crosscheck (if available)	n/a	☑

Table 3b Alushta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	W_{CH4}	W_{CH4}	W_{CH4}	Information given in the MR is consistent with one given in the PDD as well as real situation on-site.	☑
Parameter ID (if available)	n/a	n/a	n/a	Compliant.	☑
Data Unit	%	%	%	Compliant.	☑
Monitoring frequency (reading)	Measured by continuous gas quality	measured by continuous gas quality	continuously	Compliant.	☑

	analyser	analyser			
Monitoring frequency (recording)	n.a.	n.a.	Average minute values	Compliant.	☑
Calibration requirements	calibrated accord-ing to the manu-facturer.s rec-ommendation	calibrated accord-ing to the manu-facturer.s rec-ommendation	Weekly	Compliant.	☑
Uncertainty level	Low	Low	CH_4: 2% CO_2: 2% O_2: 10%	Compliant.	☑
Measurement Principle (if applicable)	Flue gas analyser	n.a.	NDIR	Compliant.	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Gas Analyser				☑
Serial Number:	4006.32				☑
Manufacturer Model Nr.:	NUK NGA 5- CH4-CO2-O2				☑
Specific Location:	System inlet measurement				☑
Measurement Range:	CH4 and CO2: 0..100% O2: 0..25%				☑
Gaps in operating time of instrument :	Data were reviewed showing its completeness and credibility. Any gaps are described in the registry log, justified in the weekly report and taken into account when calculating the emission reductions.				☑
	Default value used: n/a				☑
	Justification: n/a				☑

	QA/QC aspects	Conclusion and IRL
Source of data	Data is collected electronically by the data recording unit 'PLC' at 1 minute intervals. Type: analog data 4-20mA	☑
	Procedure: is described in the Monitoring Protocol.	☑
	Implementation of procedure: the procedure was found to have been fully implemented.	☑
	Responsibility: is transparently described in the MR.	☑
Archiving of raw data and protection measures	Weekly data collection is done by responsible JI manager. Data archiving is performed by JI manager on his PC, too, and then on CDs as back-up. Furthermore a converted excel file comprising all the data collected is sent to the project participants (Gafsa and CMM) on weekly basis.	☑
Data transfer and protection of input data for calculations	The raw data is extracted with help of software ReadWin on the JI manager's PC from the flash card of control panel on weekly basis, after that the file is converted to the excel table and stored on the JI Manager's PC and CDs. Furthermore such tables are sent to all the PPs on weekly basis.	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑
Data verification	Consistency of raw data with calculation tool: **See CAR 1 above**	**CAR 1** **FAR 1**
	Consistency of calculation tool with monitoring report: n/a as the data is not presented in the MR.	☑

Crosscheck (if available)	n/a	☑

Table 4a Yalta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	Measure the temperature of flame in the flare	Not described	Not described	n/a	☑
Parameter ID (if available)	Tex	n/a	n/a	n/a	☑
Data Unit	K	°C		n/a	☑
Monitoring frequency (reading)	Continuous	Continuously		n/a	☑
Monitoring frequency (recording)	n.a.	n.a.		n/a	☑
Calibration requirements	n.a.	Thermocouples should be replaced or calibrated every year.		n/a	☑
Uncertainty level	Low	n.a.		n/a	☑
Measurement Principle (if applicable)	Thermocouple	Thermocouple		n/a	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Please refer to table 5a				☑
Serial Number:	Please refer to table 5a				☑

Manufacturer Model Nr.:	Please refer to table 5a	☑
Specific Location:	Please refer to table 5a	☑
Measurement Range:	Please refer to table 5a	☑
Gaps in operating time of instrument :	Period: Please refer to table 5a	☑
	Default value used: Please refer to table 5a	☑
	Justification: Please refer to table 5a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: electronic data	☑
	Implementation of procedure: implemented	☑
	Responsibility: see MR	☑
	Weekly data collection is done by responsible JI manager. Data archiving is performed by JI manager on his PC, too, and then on CDs as back-up. Furthermore a converted excel file comprising all the data collected is sent to the project participants (Gafsa and CMM) on weekly basis.	☑
Archiving of raw data and protection measures	The raw data is extracted with help of software ReadWin on the JI manager's PC from the flash card of control panel on weekly basis, after that the file is converted to the excel table and stored on the JI Manager's PC and CDs. Furthermore such tables are sent to all the PPs on weekly basis.	☑
Data transfer and protection of input data for calculations	Type: electronic data	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	Please refer to table 5a	☑

Data verification	Consistency of raw data with calculation tool: Please refer to table 5a	☑
	Consistency of calculation tool with monitoring report: Please refer to table 5a	☑
Crosscheck (if available)	n/a	☑

Table 4b Alushta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	Measure the temperature of flame in the flare	Measurement of the exhaust gas temperature.	Measurement of the exhaust gas temperature.	n/a	☑
Parameter ID (if available)	Tex	Tflare	Tflare	n/a	☑
Data Unit	K	°C	°C	n/a	☑
Monitoring frequency (reading)	Continuous	Continuously	Continuously	n/a	☑
Monitoring frequency (recording)	n.a.	n.a.	every min	n/a	☑
Calibration requirements	n.a.	Thermocouples should be replaced or calibrated every year.	Thermocouples should be replaced or calibrated every year.	n/a	☑
Uncertainty level	Low	n.a.	n.a.	n/a	☑

Measurement Principle (if applicable)	Thermocouple	Thermocouple	Thermocouple	n/a	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Please refer to table 5b				☑
Serial Number:	Please refer to table 5b				☑
Manufacturer Model Nr.:	Please refer to table 5b				☑
Specific Location:	Please refer to table 5b				☑
Measurement Range:	Please refer to table 5b				☑
Gaps in operating time of instrument :	Period: Please refer to table 5b				☑
	Default value used: Please refer to table 5b				☑
	Justification: Please refer to table 5b				☑
	QA/QC aspects				Conclusion and IRL
Source of data	Type: electronic data				☑
	Implementation of procedure: implemented				☑
	Responsibility: see MR				☑
	Weekly data collection is done by responsible JI manager. Data archiving is performed by JI manager on his PC, too, and then on CDs as back-up. Furthermore a converted excel file comprising all the data collected is sent to the project participants (Gafsa and CMM) on weekly basis.				☑
Archiving of raw data and protection	The raw data is extracted with help of software ReadWin on the JI manager's PC from the flash card of control panel on weekly basis, after that the file is converted to the				☑

measures	excel table and stored on the JI Manager's PC and CDs. Furthermore such tables are sent to all the PPs on weekly basis.	
Data transfer and protection of input data for calculations	Type: electronic data	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	Please refer to table 5b	☑
Data verification	Consistency of raw data with calculation tool: Please refer to table 5b	☑
	Consistency of calculation tool with monitoring report: Please refer to table 5b	☑
Crosscheck (if available)	n/a	☑

Table 5a Yalta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	T_{flare}	T_{flare}	T_{flare}	Compliant.	☑
Parameter ID (if available)	n/a	n/a	n/a	Compliant.	☑
Data Unit	-	°C	°C	Compliant.	☑
Monitoring frequency (reading)	Continuous	Continuously	Continuously	Compliant.	☑
Monitoring frequency (recording)	Continuous	Continuously	Continuously	Compliant.	☑

Calibration requirements	Not described	Thermocouples should be replaced or calibrated every year.	Thermocouples should be replaced or calibrated every year.	See CAR in the table 5b below.	**CAR 2**
Uncertainty level	Low	n.a.	Low	Compliant.	☑
Measurement Principle (if applicable)	Temperature sensor	Thermocouple	Thermocouple	Compliant.	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Thermocouple				☑
Serial Number:	K-10128				☑
Manufacturer Model Nr.:	TIRCAH 81.24 See CAR in the table 5b below.				**CAR 2**
Specific Location:	Flare measurement Insert				☑
Measurement Range:	0..1600°C				☑
Gaps in operating time of instrument :	Data were reviewed showing its completeness and credibility. Any gaps are described in the registry log, justified in the weekly report and taken into account when calculating the emission reductions.				☑
	Default value used: n/a				☑
	Justification: n/a				☑
	QA/QC aspects				Conclusion and IRL
Source of data	Type: electronic data				☑

	Implementation of procedure: implemented	☑
	Responsibility: see MR	☑
Archiving of raw data and protection measures	Weekly data collection is done by responsible JI manager. Data archiving is performed by JI manager on his PC, too, and then on CDs as back-up. Furthermore a converted excel file comprising all the data collected is sent to the project participants (Gafsa and CMM) on weekly basis.	☑
Data transfer and protection of input data for calculations	The raw data is extracted with help of software ReadWin on the JI manager's PC from the flash card of control panel on weekly basis, after that the file is converted to the excel table and stored on the JI Manager's PC and CDs. Furthermore such tables are sent to all the PPs on weekly basis.	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑
Data verification	Consistency of raw data with calculation tool: The consistency has been spot checked on a random basis. No inconsistencies have been found.	☑
	Consistency of calculation tool with monitoring report: n/a as the data are not described in the MR.	☑
Crosscheck (if available)	n/a	☑

Table 5b Alushta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL

Parameter title	T_{flare}	T_{flare}	T_{flare} Measurement of the exhaust gas temperature.	Compliant with the flaring tool.	☑
Parameter ID (if available)	n/a	n/a	Tflare	Compliant with the flaring tool.	☑
Data Unit	-	°C	°C	Compliant with the flaring tool.	☑
Monitoring frequency (reading)	Continuous	Continuously	Continuously	Compliant with the flaring tool.	☑
Monitoring frequency (recording)	Continuous	Continuously	every min	Compliant.	☑
Calibration requirements	Not described	Thermocouples should be replaced or calibrated every year.	Thermocouples should be replaced or calibrated every year.	Compliant with the flaring tool. See CAR below	**CAR 2** Passports of thermocouple and the last calibrations
Uncertainty level	Low	n/a	1.5%	Compliant with the flaring tool.	☑
Measurement Principle (if applicable)	Temperature sensor	Thermocouple	Thermocouple	Compliant with the flaring tool.	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Thermocouple				☑
Serial Number:	5885-00				☑
Manufacturer Model Nr.:	Jumo Type S K10129, TIRCAH81.24				☑
Specific Location:	Flare measurement Insert				☑

Measurement Range:	0..1600°C **<u>Corrective Action Request No 2:</u>** Please include the information on calibration/replacement of thermocouples (for Yalta and Alushta sites) into the table 5.2 of the MR. In doing so please add the identification numbers of those thermocouples maintained/replaced/calibrated.	**CAR 2**
Gaps in operating time of instrument :	Data were reviewed showing its completeness and credibility. Any gaps are described in the registry log, justified in the weekly report and taken into account when calculating the emission reductions.	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Electronic data	☑
	Implementation of procedure: implemented	☑
	Responsibility: see MR	☑
Archiving of raw data and protection measures	Weekly data collection is done by responsible JI manager. Data archiving is performed by JI manager on his PC, too, and then on CDs as back-up. Furthermore a converted excel file comprising all the data collected is sent to the project participants (Gafsa and CMM) on weekly basis.	☑
Data transfer and protection of input data for calculations	The raw data is extracted with help of software ReadWin on the JI manager's PC from the flash card of control panel on weekly basis, after that the file is converted to the excel table and stored on the JI Manager's PC and CDs. Furthermore such tables are sent to all the PPs on weekly basis.	☑
	Quality of evidence	Conclusion and IRL

Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑
Data verification	Consistency of raw data with calculation tool: The consistency has been spot checked on a random basis. No inconsistencies have been found.	☑
	Consistency of calculation tool with monitoring report: n/a as the data are not described in the MR.	☑
Crosscheck (if available)	n/a	☑

Table 6a Yalta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	T	T	T	T and P are measured within the Landfill gas flow meter and are used for normalization of the LFG flow	☑
Parameter ID (if available)	n/a	n/a	n/a	n/a	☑
Data Unit	°C	°C	°C	Compliant.	☑
Monitoring frequency (reading)	Continuous	Continuously / periodically	Continuously / periodically	Compliant.	☑
Monitoring frequency (recording)	n.a.	n.a.	1 min	Compliant.	☑

Calibration requirements	according to the manufacturer's rec-ommendation	n.a.	See table 1 Yalta site	See table 1 Yalta site	☑
Uncertainty level	Low	Low	See table 1 Yalta site	See table 1 Yalta site	☑
Measurement Principle (if applicable)	n.a.	n.a.	Thermometer	Compliant.	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Thermometer				☑
Serial Number:	See flow meter table 1 Yalta site				☑
Manufacturer Model Nr.:	See flow meter table 1 Yalta site				☑
Specific Location:	T and P is measured within the Landfill gas flow meter and is used for normalization of the LFG flow				☑
Measurement Range:	n/a				☑
Gaps in operating time of instrument :	Data were reviewed showing its completeness and credibility. Any gaps are described in the registry log, justified in the weekly report and taken into account when calculating the emission reductions.				☑
	Default value used: n/a				☑
	Justification: n/a				☑
	QA/QC aspects				Conclusion and IRL
Source of data	See table 1 Yalta site Type: electronic data.				☑
	See table 1 Yalta site				☑
	See table 1 Yalta site				☑

	Implementation of procedure:	
	See table 1 Yalta site Responsibility:	☑
Archiving of raw data and protection measures	See table 1 Yalta site	☑
Data transfer and protection of input data for calculations	See table 1 Yalta site	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	See table 1 Yalta site	☑
Data verification	See table 1 Yalta site	☑
	Consistency of calculation tool with monitoring report: n/a as the data are not described in the MR.	
Crosscheck (if available)	n/a	☑

Table 6b Alushta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	T	T	T	T and P are measured within the Landfill gas flow meter and are used for normalization of	☑

				the LFG flow	
Parameter ID (if available)	n/a	n/a	n/a	n/a	☑
Data Unit	°C	°C	°C	consistent	☑
Monitoring frequency (reading)	Continuous	Continuously / periodically	See table 1 Alushta site	See table 1 Alushta site	☑
Monitoring frequency (recording)	n/a	n/a	n/a	n/a	☑
Calibration requirements	according to the manufacturer's recommendation	n/a	See table 1 Alushta site	See table 1 Alushta site	☑
Uncertainty level	Low	Low	See table 1 Alushta site	See table 1 Alushta site	☑
Measurement Principle (if applicable)	n/a	n/a	Thermometer	consistent	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Thermometer (see Table 1 Alushta site)				☑
Serial Number:	See flow meter table 1 Alushta site				☑
Manufacturer Model Nr.:	See flow meter table 1 Alushta site				☑
Specific Location:	T and P is measured within the Landfill gas flow meter and is used for normalization of the LFG flow				☑
Measurement Range:	See table 1 Alushta site				☑
Gaps in operating time of instrument :	Period: n/a				☑
	Default value used: n/a				☑
	Justification: n/a				☑

	QA/QC aspects	Conclusion and IRL
Source of data	See table 1 Alushta site	☑
	See table 1 Alushta site	☑
	Implementation of procedure: See table 1 Alushta site	☑
	Responsibility: See table 1 Alushta site	☑
Archiving of raw data and protection measures	See table 1 Alushta site	☑
Data transfer and protection of input data for calculations	See table 1 Alushta site	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑
Data verification	Consistency of raw data with calculation tool: The consistency has been spot checked on a random basis. No inconsistencies have been found.	☑
	Consistency of calculation tool with monitoring report: n/a as the data are not described in the MR.	☑
Crosscheck (if available)	n/a	☑

Table 7a Yalta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	p	p	p	T and P are measured within the Landfill gas flow meter and are used for normalization of the LFG flow	☑
Parameter ID (if available)	n/a	n/a	n/a	n/a	☑
Data Unit	Pa	Pa	Pa	consistent	☑
Monitoring frequency (reading)	Continuous	Continuously / periodically	See table 1 Yalta site	See table 1 Yalta site	☑
Monitoring frequency (recording)	n.a.	n.a.	See table 1 Yalta site	See table 1 Yalta site	☑
Calibration requirements	n.a.	n.a.	See table 1 Yalta site	See table 1 Yalta site	☑
Uncertainty level	Low	Low	See table 1 Yalta site	See table 1 Yalta site	☑
Measurement Principle (if applicable)	Pressure gauge	n.a.	Pressure transmitter in the flow meter installed	consistent	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Pressure Transmitter				☑
Serial Number:	See table 1 Yalta site				☑

Manufacturer Model Nr.:	See table 1 Yalta site	☑
Specific Location:	T and P is measured within the Landfill gas flow meter and is used for normalization of the LFG flow	☑
Measurement Range:	See table 1 Yalta site	☑
Gaps in operating time of instrument :	Data were reviewed showing its completeness and credibility. Any gaps are described in the registry log, justified in the weekly report and taken into account when calculating the emission reductions.	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: See table 1 Yalta site	☑
	See table 1 Yalta site Since the flow is recorded at NTP, the pressure is not used in calculations, but is recorded to be complete	☑
	Implementation of procedures: See table 1 Yalta site	☑
	Responsibility: See table 1 Yalta site	☑
Archiving of raw data and protection measures	See table 1 Yalta site	☑
Data transfer and protection of input data for calculations	See table 1 Yalta site	☑
	Quality of evidence	Conclusion and IRL

Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑
Data verification	Consistency of raw data with calculation tool: The consistency has been spot checked on a random basis. No inconsistencies have been found.	☑
	Consistency of calculation tool with monitoring report: n/a as the data are not described in the MR.	☑
Crosscheck (if available)	n/a	☑

Table 7b Alushta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	p	p	p	T and P are measured within the Landfill gas flow meter and are used for normalization of the LFG flow	☑
Parameter ID (if available)	n/a	n/a	n/a	n/a	☑
Data Unit	Pa	Pa	Pa	consistent	☑
Monitoring frequency (reading)	Continuous	Continuously / periodically	See table 1 Alushta site	See table 1 Alushta site	☑
Monitoring frequency (recording)	n/a	n/a	See table 1 Alushta site	See table 1 Alushta site	☑

Calibration requirements	n/a	n/a	See table 1 Alushta site	See table 1 Alushta site	☑
Uncertainty level	Low	Low	See table 1 Alushta site	See table 1 Alushta site	☑
Measurement Principle (if applicable)	Pressure gauge	n/a	Pressure transmitter in the flow meter installed		☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Pressure Transmitter				☑
Serial Number:	See table 1 Alushta site				☑
Manufacturer Model Nr.:	See table 1 Alushta site				☑
Specific Location:	T and P is measured within the Landfill gas flow meter and is used for normalization of the LFG flow				☑
Measurement Range:	See table 1 Alushta site				☑
Gaps in operating time of instrument :	Period: n/a				☑
	Default value used: n/a				☑
	Justification: n/a				☑
	QA/QC aspects				Conclusion and IRL
Source of data	Type: See table 1 Alushta site				☑
	See table 1 Alushta site Since the normalized flow is recorded at NTP, the pressure is not used in calculations, but is recorded to be complete				☑

	Implementation of procedures: See table 1 Alushta site	☑
	Responsibility: See table 1 Alushta site	☑
Archiving of raw data and protection measures	See table 1 Alushta site	☑
Data transfer and protection of input data for calculations	See table 1 Alushta site	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑
Data verification	Consistency of raw data with calculation tool: The consistency has been spot checked on a random basis. No inconsistencies have been found.	☑
	Consistency of calculation tool with monitoring report: n/a as the data are not described in the MR.	☑
Crosscheck (if available)	n/a	☑

Table 8a Yalta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	Other flare operation parameters according to the Annex 13 EB28	Other flare operation parameters	Status of the flare operation ON/OFF	Compliant.	☑
Parameter ID (if available)	n/a	n/a	n/a	n/a	☑
Data Unit	n/a	n/a	h	Correct	☑
Monitoring frequency (reading)	n/a	n/a	Continuous; but documented weekly	Implemented as described in the MR	☑
Monitoring frequency (recording)	n/a	n/a	Continuous; but documented weekly	Implemented as described in the MR	☑
Calibration requirements	n/a	n/a	n/a	n/a	☑
Uncertainty level	n/a	n/a	n/a	n/a	☑
Measurement Principle (if applicable)	n/a	n/a	Flare counter	Implemented as described in the MR	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	Flare counter is part of the control panel on the flaring unit				☑
Serial Number:	-				☑
Manufacturer Model Nr.:	-				☑
Specific Location:	Control panel on the flaring unit				☑
Measurement Range:	-				☑

Gaps in operating time of instrument :	Data were reviewed showing its completeness and credibility. Any gaps are described in the registry log, justified in the weekly report and taken into account when calculating the emission reductions.	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: on/off	☑
	Procedure is described in the monitoring protocol	☑
	Implementation of procedures: operator makes readings of OH every 2 hours and notes them into the log book- only for internal control; the minutes values are reported on the control panel and can be extracted with all the other values.	☑
	Responsibility: are described in the MP. Responsible person- operator.	☑
Archiving of raw data and protection measures	See above.	☑
Data transfer and protection of input data for calculations	See above.	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑

Data verification	Consistency of raw data with calculation tool: The consistency has been spot checked on a random basis. No inconsistencies have been found.	☑
	Consistency of calculation tool with monitoring report: n/a as the data are not described in the MR.	☑
Crosscheck (if available)	n/a	☑

Table 8b Alushta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	Other flare operation parameters according to the Annex 13 EB28	Other flare operation parameters	Status of the flare operation ON/OFF	consistent	☑
Parameter ID (if available)	n/a	n.a.	n/a	n/a	☑
Data Unit	n/a	n/a	h	Correct	☑
Monitoring frequency (reading)	n/a	n/a	Continuous; but documented weekly	Implemented as described in the MR	☑
Monitoring frequency (recording)	n/a	n/a	Continuous; but documented weekly	Implemented as described in the MR	☑
Calibration requirements	n/a	n/a	-	n/a	☑
Uncertainty level	n/a	n/a	-	n/a	☑
Measurement Principle (if applicable)	n/a	n/a	Flare counter	Implemented as described in the MR	☑

	Technical aspects	Conclusion and IRL
Instrument Type:	Flare counter is part of the control panel on the flaring unit	☑
Serial Number:	-	☑
Manufacturer Model Nr.:	-	☑
Specific Location:	Control panel on the flaring unit	☑
Measurement Range:	-	☑
Gaps in operating time of instrument :	Data were reviewed showing its completeness and credibility. Any gaps are described in the registry log, justified in the weekly report and taken into account when calculating the emission reductions.	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: on/off	☑
	Procedure is described in the monitoring protocol	☑
	Implementation of procedures: operator makes readings of OH every 2 hours and notes them into the log book- only for internal control; the minutes values are reported on the control panel and can be extracted with all the other values.	☑
	Responsibility: are described in the MP. Responsible person- operator.	☑
Archiving of raw data and protection measures	See above.	☑
Data transfer and protection of input	See above.	☑

data for calculations		
	Quality of evidence	Conclusion and IRL
Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑
Data verification	Consistency of raw data with calculation tool: The consistency has been spot checked on a random basis. No inconsistencies have been found.	☑
	Consistency of calculation tool with monitoring report: n/a as the data are not described in the MR.	☑
Crosscheck (if available)	n/a	☑

Table 9a Yalta site

Parameter and instrumentation Information					
	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	h Operation of the energy plant	Operation of the energy plant	h Operation of the energy plant	Compliant. The parameter is reported in the weekly data reports.	☑
Parameter ID (if available)	h	n/a	$H_{electricity}$	Compliant.	☑
Data Unit	h	n/a	h	Compliant.	☑
Monitoring frequency (reading)	n/a	n/a	Continuous; but documented	Compliant.	☑

			weekly		
Monitoring frequency (re-cording)	n/a	n/a	Continuous; but documented weekly	Compliant.	☑
Calibration requirements	n/a	n/a	-	Compliant.	☑
Uncertainty level	n/a	n/a	-	Compliant.	☑
Measurement Principle (if applicable)	n/a	n/a	Flare counter	Compliant.	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	LFG piston generator counter				☑
Serial Number:	20072248				☑
Manufacturer Model Nr.:	UMG-60				☑
Specific Location:	Control panel on electricity generator installed				☑
Measurement Range:	-				☑
Gaps in operating time of in-strument :	Data were reviewed showing its completeness and credibility. Any gaps are described in the registry log, justified in the weekly report and taken into account when calculating the emission reductions.				☑
	Default value used: n/a				☑
	Insert Justification: n/a				☑
	QA/QC aspects				Conclusion and IRL
Source of data	Electronic data				☑
	Implementation of procedure: implemented				☑

	Responsibility: see MR	☑
	Weekly data collection is done by responsible JI manager. Data archiving is performed by JI manager on his PC, too, and then on CDs as back-up. Furthermore a converted excel file comprising all the data collected is sent to the project participants (Gafsa and CMM) on weekly basis.	☑
Archiving of raw data and protection measures	The raw data is extracted with help of software ReadWin on the JI manager's PC from the flash card of control panel on weekly basis, after that the file is converted to the excel table and stored on the JI Manager's PC and CDs. Furthermore such tables are sent to all the PPs on weekly basis.	☑
Data transfer and protection of input data for calculations	Electronic data	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑
Data verification	Consistency of raw data with calculation tool: The consistency has been spot checked on a random basis. No inconsistencies have been found.	☑
	Consistency of calculation tool with monitoring report: n/a as the data are not described in the MR.	☑
Crosscheck (if available)	n/a	☑

Table 9b Alushta site

Parameter and instrumentation Information

	PDD	Meth/Tool	MR	Verification Findings	Conclusion and IRL
Parameter title	h Operation of the energy plant	Operation of the energy plant	h Operation of the energy plant	Compliant. The parameter is reported in the weekly data reports.	☑
Parameter ID (if available)	h	n/a	$H_{electricity}$	Compliant.	☑
Data Unit	h	n/a	H	Compliant.	☑
Monitoring frequency (reading)	n/a	n/a	Continuous; but documented weekly	Compliant.	☑
Monitoring frequency (recording)	n/a	n/a	Continuous; but documented weekly	Compliant.	☑
Calibration requirements	n/a	n/a	-	Compliant.	☑
Uncertainty level	n/a	n/a	-	Compliant.	☑
Measurement Principle (if applicable)	n/a	n/a	Flare counter	Compliant.	☑
	Technical aspects				Conclusion and IRL
Instrument Type:	LFG piston generator counter				☑
Serial Number:	20072249				☑
Manufacturer Model Nr.:	UMG-60				☑
Specific Location:	Control panel on electricity generator installed				☑
Measurement Range:	-				☑
Gaps in operating time of in-	Data were reviewed showing its completeness and credibility. Any gaps are described in the registry log, justified in the weekly report and taken into account when calculating the emission				☑

strument :	reductions.	
	Default value used: n/a	☑
	Insert Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Electronic data	☑
	Implementation of procedure: implemented	☑
	Responsibility: see MR	☑
	Weekly data collection is done by responsible JI manager. Data archiving is performed by JI manager on his PC, too, and then on CDs as back-up. Furthermore a converted excel file comprising all the data collected is sent to the project participants (Gafsa and CMM) on weekly basis.	☑
Archiving of raw data and protection measures	See above.	☑
Data transfer and protection of input data for calculations	See above.	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	The measurement of this parameter is performed on the continuous basis, therefore the data obtained in the relevant monitoring period can be considered as complete measured data.	☑
Data verification	Consistency of raw data with calculation tool: The consistency has been spot checked on a random basis. No inconsistencies have been found.	☑

	Consistency of calculation tool with monitoring report: n/a as the data are not described in the MR.	☑
Crosscheck (if available)	n/a	☑

2.3. Parameters measured through sampling

Table 10 Yalta site

Sampling information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	ET_y	ET_y	ET_y	Compliant.	☑
Parameter ID (if available)	n/a	n/a	n/a	Compliant.	☑
Data Unit	TJ	TJ	TJ	Compliant.	☑
Sampling frequency	Annually	Annually	Weekly	**n/a** **No fossil fuel was used during the monitoring period**.	☑
Sampling point	n/a	n/a	n/a	n/a	☑
Uncertainty level	n/a	n/a	n/a	n/a	☑
	Technical aspects				Conclusion and IRL
Sampling Principle:	Manual Dip stick				☑
Methodology of Sampling:	n/a				☑

Sample Analysed by:	n/a	☑
Certification of Analyser/ Laboratory:	n/a	☑
Methodology of Sample Analysis (if applicable)	n/a	☑
Measurement Range:	n/a	☑
Gaps in sampling frequency	Period: n/a	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	Type: n/a	☑
	Procedures: ETy is calculated from the weekly measured values of gasoline used (in Litres), accumulated into monthly/annual values (in Litres), and then converted into TJ (TeraJoules) by multiplying on the Gasoline Energy Content.	☑
	Implementation of procedure: is implemented	☑
	Responsibility: Operator	☑
	Representativeness: n/a	☑
	Reproducibility: n/a	☑
Archiving of raw data and protection measures	Weekly data sets are submitted to QA/QC Manager (via email), stored by the QA/QC Manager, and backed-up onto the CCM's protected server. The weekly data sets are processed by the QA/QC Manager in accordance with the ERU calculation procedure.	☑
Data transfer and protection of input data for calculations	See above.	☑
	Quality of evidence	Conclusion

		and IRL
Completeness of data	n/a	☑
Data verification	Consistency of raw data with calculation tool: n/a	☑
	Consistency of calculation tool with monitoring report: n/a	☑
Crosscheck (if available)	n/a	☑

Table 10 Alushta site

Sampling information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	Thermal energy used in landfill during project	Thermal energy used in landfill during project	Amount of fossil fuel used by on-site diesel generator to meet project requirement	Compliant.	☑
Parameter ID (if available)	ET_y	ET_y	ET_y	Compliant.	☑
Data Unit	TJ	TJ	TJ	Compliant.	☑
Sampling frequency	Annually	Annually	Weekly	**n/a** **No fossil fuel was used during the monitoring period.**	☑
Sampling point	n/a	n/a	n/a	n/a	☑

Uncertainty level	n/a	n/a	n/a	n/a	☑
	Technical aspects				Conclusion and IRL
Sampling Principle:	Manual Dip stick				☑
Methodology of Sampling:	n/a				☑
Sample Analysed by:	n/a				☑
Certification of Analyser/ Laboratory:	n/a				☑
Methodology of Sample Analysis (if applicable)	n/a				☑
Measurement Range:	n/a				☑
Gaps in sampling frequency	Period: n/a				☑
	Default value used: n/a				☑
	Justification: n/a				☑
	QA/QC aspects				Conclusion and IRL
Source of data	Type: n/a				☑
	Procedures: ETy is calculated from the weekly measured values of gasoline used (in Litres), accumulated into monthly/annual values (in Litres), and then converted into TJ (TeraJoules) by multiplying on the Gasoline Energy Content.				☑
	Implementation of procedure: is implemented.				☑
	Responsibility: Operator				☑
	Representativeness: n/a				☑
	Reproducibility: n/a				☑

Archiving of raw data and protection measures	Weekly data sets are submitted to QA/QC Manager (via email), stored by the QA/QC Manager, and backed-up onto the CCM's protected server. The weekly data sets are processed by the QA/QC Manager in accordance with the ERU calculation procedure.	☑
Data transfer and protection of input data for calculations	See above.	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	n/a	☑
Data verification	Consistency of raw data with calculation tool: n/a	☑
	Consistency of calculation tool with monitoring report: n/a	☑
Crosscheck (if available)	n/a	☑

2.4. Parameters obtained through external sources and accounting data

Table 11 Yalta site

External sources and accounting information					
	PDD	Meth/Tool	MR	Verified	Con-clusion and IRL
Parameter title	CO2 emission in-tensity of the ther-mal energy	CO2 emission intensity of the thermal energy	CO2 emission in-tensity of the ther-mal energy	n/a	☑
Parameter ID (if available)	$CEF_{thermal}$	$CEF_{thermal,y}$	$CEF_{thermal}$	n/a	☑
Data Unit	t CO_2/ TJ	t CO_2/ TJ	The data unit is missing in the MR.	n/a	☑

	Technical aspects	Con-clusion and IRL
Description of Data / Data Refers to:	Monitoring Plan: CO2 emission intensity of the thermal energy- will be specific to the fossil fuel used on-site. n/a in the current Monitoring period.	☑
Date of Data:	n/a	☑
Gaps in data	Period: n/a	☑
	Default value used: n/a	☑
	Justification: n/a	☑
	QA/QC aspects	Con-clusion and IRL
Source of data	n/a	☑
	Responsibility: Gafsa.	☑
	n/a	☑
Reliability of Data Source:	n/a	☑
Is the Data up-to-date?	n/a	☑
Archiving of raw data and protection measures	n/a	☑
Data transfer and protection of input data for calculations	n/a	☑
	Quality of evidence	Con-clusion

		and IRL
Completeness of data	n/a	☑
Data verification	Consistency of raw data with calculation tool: n/a	☑
	Consistency of calculation tool with monitoring report: n/a	☑
Crosscheck (if available)	n/a	☑

Table 11 Alushta site

External sources and accounting information					
	PDD	Meth/Tool	MR	Verified	Conclusion and IRL
Parameter title	CO2 emission intensity of the thermal energy	CO2 emission intensity of the thermal energy	CO2 emission intensity of the thermal energy	n/a	☑
Parameter ID (if available)	$CEF_{thermal}$	$CEF_{thermal}$	$CEF_{thermal, y}$	n/a	☑
Data Unit	t CO_2/ TJ	t CO_2/ TJ	See table 12 of Yalta	n/a	☑
	Technical aspects				Conclusion and IRL
Description of Data / Data Refers to:	Monitoring Plan: CO2 emission intensity of the thermal energy- will be specific to the fossil fuel used on-site. n/a in the current Monitoring period.				☑
Date of Data:	n/a				☑
Gaps in data	Period: n/a				☑
	Default value used: n/a				☑

	Justification: n/a	☑
	QA/QC aspects	Conclusion and IRL
Source of data	n/a	☑
	Responsibility: Gafsa.	☑
	n/a	☑
Reliability of Data Source:	n/a	☑
Is the Data up-to-date?	n/a	☑
Archiving of raw data and protection measures	n/a	☑
Data transfer and protection of input data for calculations	n/a	☑
	Quality of evidence	Conclusion and IRL
Completeness of data	n/a	☑
Data verification	Consistency of raw data with calculation tool: n/a	☑
	Consistency of calculation tool with monitoring report: n/a	☑
Crosscheck (if available)	n/a	☑

2.5. Other parameters (e.g. not included in the methodology / tool, but included in the PDD)

Other information				
	PDD	MR	Verified	Conclusion

				and IRL
Parameter title	n/a	n/a	n/a	☑
Parameter ID (if available)	n/a	n/a	n/a	☑
Data Unit	n/a	n/a	n/a	☑
	Technical aspects			Conclusion and IRL
Description of Data / Data Refers to:	n/a			☑
Date of Data:	*Date* n/a			☑
Gaps in data	Period: n/a			☑
	Default value used: n/a			☑
	Justification: n/a			☑
	QA/QC aspects			Conclusion and IRL
Source of data	Type: n/a			☑
	Responsibility: n/a			☑
	Representativeness: n/a			☑
Reliability of Data Source:	n/a			☑
Archiving of raw data and protection measures	Describe how the data will be archived, e.g. in CDs, in archive (for paper). n/a			☑
Data transfer and protection of input data for calculations	Manual or digital transfer from raw data source to input data for calculations (in calculation tool); how is it done and who does it? n/a			☑

	Quality of evidence	Conclusion and IRL
Completeness of data	n/a	☑
Data verification	Consistency of raw data with calculation tool: n/a	☑
	Consistency of calculation tool with monitoring report: n/a	☑
Crosscheck (if available)	n/a	☑

3. Data Processing and ER calculation

Description of data processing from transferred data to final results in the calculation tool		
Step	Description	Conclusion and IRL
Consistency	The data are recorded and transferred electronically. Spot checks between raw data and the data used in the calculation sheet did not reveal any inconsistencies. Hence, the data are considered to be consistent. All abbreviations and units are consistent with the PDD and Methodology and traceable to the raw data.	☑
Calculation Tool description	The calculation tool basically consists of a 4 Excel files. One Excel files contains the raw data derived from the Monitoring system PLC which provides data in Excel and rsd format (secured files which can be opened only with the special software from the limited amount of computers). Also a Log and Registry files are derived from the PLC. In the next Excel file the data is treated and contains the calculations on minutely basis with consistent hourly flaring efficiency selected acc. to the default approach as per the flaring tool. The last Excel file is the ERUs FINAL SUMMARY which shows a complete and traceable data set of the monitoring period. Formulas and intermediate steps are stated and it includes all monitoring parameters with correct units. The whole calculation tool is clearly and transparently described in the Monitoring Re-	☑

	port chapter 4.	
Elimination of not plausible data (if applicable)	Not plausible data obtained are set zero. **Corrective Action Request No 3:** Please be aware that methane contents > 55 % are not plausible in landfill gas during continuous operation of the flare. Please remove these values from the data sets. **Forward Action Request No 1:** It is recommended to report the minimum and maximum flow values on the weekly basis. The values above the normal cumulative capacity have to be justified and processed conservatively.	**CAR 3** **FAR 1**
Transformation from useable data to input data for further calculation (if applicalbe)	The data management applies to the following data types: 1. Electronic data (gas consumption, flare and power parameters) 2. hand written data; and, 3. External data from third parties. The electronic data have been transferred electronically. Data on operations and fuel consumption have been gathered in journals and transferred to excel sheets. The spot checks done by the audit team did not reveal any errors.	☑
Ex-ante data	n/a	☑
Default parameter	The default values are mentioned in the MR chapter 3.3.	☑
Formulae check	The formulae have been checked by TÜV SÜD. No errors have been found.	☑
Rounding functions	No specific rounding functions have been used. In the data and calculation sheets rounding has been done according to the excel procedures.	☑
Calculation tool changes and protection measures	There are no specific protection measures implemented on the calculation tool.	☑
Reported data	The figures of the MR are consistent with the figures of the calculation tool.	☑

4. Additional assessment (both sites)

4.1. Internal Review

Description and performance of internal review		
	Description	Conclusion and IRL
Procedure	A data procedure has been developed to ensure that the monitoring protocol meets JI requirements (particularly that of ACM0001 Version 5, Annex 13 EB 28) and CCM's internal policies. A check is performed by the JI Monitoring Manager each week for the receipt of data, completeness of data and calculation correctness upon receipt of data file and the JI Weekly Report. The data file and the JI Weekly Report are then transferred to QA/QC Manager, who would conduct additional QA/QC. Inconsistencies or errors in the data are noted in the Data Log file. Data will be considered valid and correct once there have been no errors or inconsistencies in the data as per the checks. The procedures have been outlined in the Monitoring Protocol which is a monitoring manual containing all applied QA/QC procedures. **Forward Action Request No 2:** It is recommended to control also the maximum and minimum methane concentration on a weekly basis in order to immediately recognize the implausible data and take appropriate action in case of any equipment failure.	**FAR 2** IRL 12
Documentation	The performance of the facilities is documented in weekly reports	☑ IRL 12
Responsibilities	The responsibilities are clearly defined and described in the MR.	☑

4.2. Peculiarities

Description of Peculiarities and unexpected Daily Events during the verification period

	Description	Conclusion and IRL
Performance	According to the weekly reports and the gaps in the data sets there are many interruptions at Alushta site because of the operation of the landfill.	☑
Documentation	All the daily events occurred during the relevant monitoring period are reported by Gafsa to the project manager on weekly basis. The events are summarized for the entire week in the weekly report specifying the respective reason of such event. Project manager is responsible for weekly review of the reports and decision regarding an appropriate action in data handling, if necessary.	☑
Measures	The operation is continuously supervised by GAFSA staff. The audit team got the impression that the staff is well familiar with the equipment.	☑

4.3. Further additional requirements (both sites)

Description of additional requirements to be checked		
	Description	Conclusion and IRL
Environmental issues	n/a	☑
Landfill regulatory requirements	The regulatory requirements are met which has been confirmed by the responsible national authority.	☑ IRL 25

4.4. Data Reporting (both sites)

Description of the Monitoring Report		
	Comments and Results	Conclusion and IRL

Compliance with UNFCCC JISC regulations	The published Monitoring Report was assessed based on the registered PDD and the applied methodology. The final Monitoring Report is in compliance with the UNFCCC JISC regulations. The verification period is correctly stated in the Monitoring Report.	☑
Completeness and Transparency	The assessment verified the completeness and transparency of the data and the information presented in the monitoring report. All other data and information is found to be transparent and complete.	☑
Correctness	Values from the assessed calculation tool and other relevant sources were correctly transferred to the final Monitoring Report. See also comments to chapter 3 of this checklist.	☑

5. Compilation and Resolutions of CARs, CRs and FARs

Corrective Action Requests by audit team			
	Comments and Results	Ref	Conclu-sion and IRL
Issue	**Corrective Action Request No.1** The data spot check showed implausibly high methane concentrations in the residual gas, which could not be explained by maintenance or other daily events. The PPs are requested to treat that data taking into account conservative bias. Also refer to the FAR1.	Chapter 2.2 Table 3b	☑
Response	All data sets for both Alushta and Yalta have been reviewed with regard of CH4 concentration. At most of those few times it has been spotted, temporary high CH4 values can be observed during the plant turn-on after a sufficient stop in operation (accumulated gas). To provide the most accurate and conservative ERU Calculation procedure, the Procedure has been upgraded by introducing the CH4 LFG content benchmark (55%) into the Quality Factor. Consequently the assumption and method of assessment of a quality minute has been changed as following (stated in each "Read me" spreadsheet of every upgraded ERU Calculation file): The basic assumptions are: - 1) The Flare used is an enclosed High-temperature and High-efficiency Flare, for which a minimum appropriate temperature in the exhaust gas of the flare T_{flare} is 700 C; 2) The system is operating and the CH4 content in the landfill gas should not exceed 55%. - If in any minute (data point) of an hour *h* T_{flare} is > 700 C, AND $fv_{CH4,m}$ <0.55, AND the Flare status is "ON", AND the Plant Status is "Ready" this minute meets ALL operational requirements and is assigned with a Quality factor "1"; otherwise, Quality factor is "0"; - When there are less than 60 data points for an hour *h*, the missing data points are assumed to have "0" Quality factor; - IF sum of Quality factors for each calendar hour *h* is 60, than ALL manufacturer's specifications on proper operation of the flare are met continuously and the Tool's requirement on T_{flare} to be above 500 C for more than 40 minutes during the hour *h* is met as well (as 700 C> 500 C), thus the Default Flare Efficiency in that hour		

Corrective Action Requests by audit team			
	h is 90%; - IF sum of Quality factors for each calendar hour *h* is less than 60 but more or equals 40, than the Tool's requirement on T_{flare} to be above 500 C for more than 40 minutes in the hour *h* is assumed to be met (as 700 C > 500 C), but manufacturer's specifications on proper operation of the flare are not met continuously and, thus, the Default Flare Efficiency in that hour *h* will be 50%; - IF sum of Quality factors for each calendar hour *h* is less than 40, than the Tool's requirement on T_{flare} to be above 500 C for more than 40 minutes in the hour *h* is assumed to be NOT met and the Default Flare Efficiency in that hour *h* is assumed to be 0%. As the result of the upgrade all minutes with CH4 LFG >55% were disqualified and treated as those that do not meet operational requirements. It is worthy to mention, <u>that the upgrade of the ERU Calculation (quality factor assignment) Procedure has resulted with an insignificant change of the ERUs amount (**less than 0.14% of the total amount**).</u> This can evidence of the good quality of the data provided, solid and very conservative approach of the data assessment and processing.		
Assessment	An appropriate excel procedures has been developed and the data have been cleared up. Hence, CAR 1 is solved.		
Issue	**<u>Corrective Action Request No 2:</u>** Please include the information on calibration/replacement of thermocouples (for Yalta and Alushta sites) into the table 5.2 of the MR. In doing so please add the identification numbers of those thermocouples maintained/replaced/calibrated.	Chapter 2.2 Table 5b	☑
Response	The Information has been included into the Table 5.2 of the MR 002 (Ver.2).		
Assessment	Table 5.2 has been revised according to the comments and explanations. The given facts correspond with the calibration protocols (IRL 20). Hence, CAR 2 is solved.		
Issue	**<u>Corrective Action Request No 3:</u>** It shall be integrated with CAR#1 Please be aware that methane contents > 55 % are not plausible in landfill gas during continuous operation of the flare. Please remove these values from the data sets.	Chapter 3	☑

Corrective Action Requests by audit team			
Response	See CAR 1		
Issue	**Corrective Action Request No 4:** The table A.1.3 has to be corrected by including the correct figures in the last column "Emission reductions ERy".	General	☑
Response	While the correct values have been automatically displayed in the Excel Summary file, the numbers in the Table A.1.3 of the Monitoring Report (Ver.2) needed to be corrected manually; the first column with values in the Table A.1.3 contained correct numbers, while the last was skipped by mistake. This mistake has been corrected resulting with the table provide correct and consistent values.		
Assessment	The assessment team reviewed the revised MR, cross-checking the values presented in the table A.1.3 with those provided by the final version of the Excel calculation sheet. The values were found consistent throughout these documents. Thus this issue is solved.		
Clarification Requests by audit team			
Issue	**Clarification Request No 1:** When assessing the weekly reports the audit team noticed that there were several stops in flare operation resulting in very low or zero emission reductions. Even though the reasons were clarified to the assessment team and found to be plausible, they have to be reported in the MR, e.g. after the table A.1.1 in order to clarify low or no emission reductions in November 2010- February 2011 (Alushta) and January-March 2011 (Yalta).	General	☑
Response	An explanation (Note) has been added into the Monitoring Report after the Table A.1.1. (See Final MR 002 Ver.3, Annex 1, p.18).		
Assessment	The assessment team reviewed the revised MR. The explanation provided for the low ERs figures is plausible and consistent with the one provided to the auditors by the weekly reports and interviews on-site. Thus this issue is solved.		
Issue	**Clarification Request No 2:** The MR, e.g. chapter 4, has to be amended by including a comparison of achieved emission reductions and the estimates presented in the registered PDD. Any significant difference	General	☑

Corrective Action Requests by audit team			
	has to be explained.		
Response	A reference paragraph to the Table A.1.4, which provides comparison of the achieved ERs to the PDD estimates, was added in the Clause 4.1. The Values in the Table were supported with a brief explanation/note (See Final MR 002 Ver.3, Annex 1, Table A.1.4 p.19).		
Assessment	The revised MR was reviewed by the audit team. The Annex 1 table A.1.4 provides a clear analysis of the emission reductions by comparing the emission reduction achieved to the estimates presented in the registered PDD. The difference is explained transparently on page 19 of the revised MR. This issue is solved.		
Forward Action Requests by audit team			
	Comments and Results	Ref	Conclusion and IRL
Issue	**Forward Action Request No 1:** It is recommended to report the minimum and maximum flow values on the weekly basis. The values above the normal cumulative capacity have to be justified and processed conservatively.	Chapter 3	
Response	This recommendation was taken to consideration by the Project JI Manager.		
Assessment	Will be verified at the next verification.		
Issue	**Forward Action Request No 2:** It is recommended to control also the maximum and minimum methane concentration on a weekly basis in order to immediately recognize the implausible data and take appropriate action in case of any equipment failure.	Chapter 4.1	
Response	This recommendation was taken to consideration by the Project JI Manager.		
Assessment	Will be verified at the next verification.		

Annex 2: Information Reference List

Ref. No.	Issuance and/or submission date(dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information
1	17/02/2009	- Final PDD “Landfill methane capture and flaring at Yalta and Alushta landfills, Ukraine”, Version 08, project no. 0050. -Final determination Report for JI Track 2 project “Landfill methane capture and flaring at Yalta and Alushta landfills, Ukraine”, dated 15.06.2009	Carbon Capital Markets Ltd TÜV SÜD	Registered PDD and final determination report
2	EB 28: 15/12/2006 EB 39: 16/05/2008 EB 41: 02/08/2008	- CDM approved baseline and monitoring methodology and tools: - Approved consolidated baseline and monitoring methodology ACM0001 Version 05 “Consolidated baseline and monitoring methodology for landfill gas project activities”, EB 28, annex 13, - “Tool to determine project emissions from flaring gases containing methane” (Ver 01), EB28 - “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site (Version 04), Annex 10, EB 41”. - “Tool for the demonstration and assessment of additionality, version 5, Annex 10, EB 39”	UNFCCC	
3		On-site interviews conducted by TÜV SÜD 13th till 15th of December 2011: Verification Team: Dr. Albert Geiger — TÜV SÜD Industrie Service GmbH GHG-VER and technical expert Ms. Olena Maslova — TÜV SÜD Industrie Service GmbH GHG-VER and host country expert Interviewed persons: Mrs. Natalia Kovalchuk — Gafsa (monitoring manager)	TÜV SÜD	

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		Mr. Igor Tsukornyk Gafsa (chief engineering) Mr. Yaroslav Kukhar Gafsa (General director) Mr. Serhiy Porovskyy Carbon Capital Markets Mr. Serhiy Trifanjuk Site Manager Yalta and Alushta Landfill sites		
4	24/11/2011	JI Monitoring Report, version 1	Carbon Capital Markets Ltd	First version of the MR
5	06/02/2012	JI Monitoring Report, final version 3	Carbon Capital Markets Ltd	Final MR
6	12/01/2012- 06/02/2012	Excel spread sheets with the calculation of the emission reductions	Carbon Capital Markets Ltd	ERs calculation
7	22/11/2010	Monitoring Protocol, version 2	Carbon Capital Markets Ltd	
8	24/11/2011	Excel spread sheets comprising monthly data obtained at Alushta and Yalta landfill sites.	Carbon Capital Markets Ltd	
9	16/06/2010	Passports of the main electricity generators UMG-60, installed at Yalta and Alushta sites stating commissioning dates to be 25.02.2008 for both sites.	GAFSA	
10	16/06/2010	Owner’s manuals for the start-up generators installed at Yalta (Volka gasoline generator, commissioning date is 04.06.2008) and Alushta (SDMO gasoline generator, commissioning date is 28.06.2008) landfill sites.	GAFSA	
11	13/-15/12/2011	Photos of the project related equipment installed at the both landfill sites taken during on-site visit.	TÜV SÜD	
12	24/11/2011	Weekly monitoring reports (acc. to the internal QC procedure) for the entire monitoring period incl. all raw data and daily events	GAFSA	

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13	13/11/2011	Trainings plan incl. list of participants in the trainings conducted during the entire monitoring period.	GAFSA	
14	01/06/2008	GAFSA’s working instructions for health and safety	GAFSA	
15	26/06/2008	Commissioning protocol of HOFGAS- Ready 800 installed at Yalta landfill site	Hofstetter Umwelttechnik AG	Manufacturer
16	26/06/2008	Commissioning protocol of HOFGAS- Ready 500 installed at Alushta landfill site	Hofstetter Umwelttechnik AG	Manufacturer
17	22/01/2010	Calibration certificate for the flow meter SM-RI-X-K/150/G650 Serial No. 10510656 (incl. temperature and pressure meters) installed at Alushta landfill site	State company “Krym’s research and production centre of standardisation, metrology and certification”	Independent third party
18	22/01/2010	Calibration certificate for the flow meter SM-RI-X-K/150/G650 Serial No. 10510655 (incl. temperature and pressure meters) installed at Yalta landfill site	State company “Krym’s research and production centre of standardisation, metrology and certification”	Independent third party
19	16/06/2010	Operating Instructions for stationary gas analyzing system for landfill gas NUK, rev. 1 incl. calibration and maintenance and troubleshooting requirements.	NUK Automatisierung Analysetechnik-Nenning und Krumm GmbH	Manufacturer
20	10.03.2010 11.03.2011	Calibration certificate for the JUMO S thermocouples installed at the both landfill sites	MCS laboratory-Schweizerischer Kalibrierdienst	Independent third party

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21	01.04.2010-31.10.2011	Zero/Span gases certificates O_2, CH_4, N_2.	Ukrainian state research and production centre of standardisation, metrology and certification (Ukrmetrteststandard)	Independent third party
22	03.03.2008 23.02.2011	Operation H&S licenses, valid from from 03.03.2008 to 02.03.2011and 23.02.2011 to 22.02.2014 incl. Annex.	State department of industry safety, health protection	Independent third party
23	06/09/2007	Operational license issued by the State geology department, valid till 01.09.2012	State Geology Department	Independent third party
24	09/2011 – 01/2012	Emails from the Carbon Capital Markets/ CAF	Carbon Capital Markets	
25	03.02.2011	Confirmation on the Ukrainian landfill regulations	Alushta’s municipal administration of the rehabilitation and capital development	Competent local authority
26	17.02.2011	Confirmation from the degassing plants manufacturer Hofstetter Umwelttechnik AG on the maximum flow and burner capacity.	Hofstetter Umwelttechnik AG	Manufacturer
27	17.06.2010	Technical specifications and operating instructions of the LFG analyzers HOFGAS- Assay (NUK) installed at the both sites.	Hofstetter Umwelttechnik AG	Supplier