



**Verified Carbon
Standard**

IZMIR LANDFILL GAS (LFG) CAPTURE AND UTILIZATION PROJECT



Document Prepared by Earthood Services Private Limited

Project Title	IZMIR Landfill Gas (LFG) Capture and Utilization Project
Version	4
Report ID	VCS-2605

Report Title	Verification report for IZMIR Landfill Gas (LFG) capture and Utilization Project.
Client	Gaia Finansal Danismanlik Hizmetleri Tic Ltd Sti
Pages	73
Date of Issue	24/07/2023
Prepared By	Earthood Services Private Limited

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Summary:

Earthood Services Private Limited (ESPL) has been contracted by Gaia Climate Finansal Danismanlik Hizmetleri ve Tic. A.Ş. to carry out an independent verification of their VCS project "IZMIR Landfill Gas (LFG) Capture and Utilization Project" with VCS ID (2605) against VCS Standard v4.4/11/. The project is implemented over an area of 57,705 square meters of area in K18-D4 topographic section within acceptance boundary of Harmandalı Solid Waste Landfill Facility in zmir Province, Cigli District, Harmandalı Gazi Mustafa Kemal Atatürk Quarter.

The verification is a complete evaluation of a project activity's implementation in relation to the relevant VCS requirements by an impartial third party. The verification includes assessment of the emission reduction in the current monitoring period.

The project activity is a Methane gas Power generation plant with total installed capacity of 32.34 MWe consisting of 22 Janbacher gas engines with each engine of 1.47 MWe capacity. The project activity has planned to rehabilitate the Harmandalı Solid Waste Disposal Site which receives municipal solid waste from 23 different districts of zmir province. The project activity will be generating electricity from the landfill gas. The Project activity will lead to reduction in GHG emissions by substituting the equal amount of electricity produced by the fossil fuel-fired power stations.

Also, the project activity prevents the release of methane that would be generated and emitted from the decomposition of the municipal solid waste. The project activity is anticipated to reduce GHG emissions by an average of 558,124 tCO₂eq/y over the 7-year renewal crediting period.

Therefore, throughout the project's first crediting period, 3,906,866 tCO₂eq of emissions are anticipated to be reduced. The project activity in the current monitoring period from 25/10/2019 to 30/09/2022 has reduced 2,445,711 tCO₂e of GHG emission by displacing around 554,345 MWh of electricity from the fossil fuel dominated grid.

The scope of the verification includes confirming the implementation of the monitoring plan with the registered MR, version 11, dated 12/06/2023, and the application of the monitoring methodology ACM0001 "Flaring or use of landfill gas 6" - Version 19/7/. There are various tools applied during this current monitoring period, among which are described: -

"Combined tool to identify the baseline scenario and demonstrate additionality" (Version 07.0) also known as "Additionality tool", "Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion" (Version 03.0), "Emissions from solid waste disposal sites" (Version 08.0), "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (Version 03.0), "Tool to determine the mass flow of a greenhouse gas in agaseous stream" (Version 03.0).

The verification consists of three phases:

- Desk review of the project
- Follow-up interview with the Project Proponent/ Project Developer
- Resolution of outstanding issues and issuance of final verification report and opinion.

The overall verification, from the contract review to verification report & opinion, was conducted following Earthood internal quality procedures. A risk-based approach has been followed to perform this verification activity and there are significantly low uncertainties associated with this verification. During verification process, a total of 11 findings were raised, which includes 03 CARs, 07 CL, and 01 FARs. These are covered in more detail in Appendix II.

The monitoring report, emission reduction calculations, and accompanying documents provided are all in compliance with VCS criteria. The verification was completed with a reasonable level of assurance and no uncertainties were found related with the project activity verification.

Earthood certifies that the project meets the relevant requirements of VCS MR template v4.2/2/, VCS Standard v4.4/11/ and the methodology ACM0001 "Flaring or use of landfill gas 6" v19/7/. Reviewing the monitoring report and other documentation pertaining to baseline and monitoring methods, gathering further background data, and conducting interviews with project owners have given Earthood enough justification to confirm that the specified VCS requirements have been met. Hence, Earthood is able to certify that the emission reductions from the project activity for the monitoring period from 25/10/2019 to 30/09/2022 amount to 2,445,711 tCO₂e.

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1 INTRODUCTION

1.1 Objective

The objective of this verification is to thoroughly examine and independently confirm the project's emission reductions. The verification process includes review of all the supporting documentation that may be needed to substantiate the sources and sinks of greenhouse gases (GHGs) that are located within the project boundary, the procedures involved, the metrics for qualifying these monitored parameters, as well as their level of reliability, and the validity of the supporting documents shared at each stage of the verification process. Verification is an independent assessment and retrospective judgement by Earthood of the observed reductions in GHG emissions that have taken place during the current monitoring period. This verification activity's objective is to evaluate with verifiable facts:

- The monitoring report's data are transparent and complete and in the event that the project activity complies with the monitoring report and the registered PD/01/.
- The monitoring report version 11 from 12/06/2023/2/ complies with the guidelines of the monitoring plan for the registered Project Description (PD)/1/ and the authorized methodology.

1.2 Scope and Criteria

The independent and objective assessment of the project activity's implementation and the ex-post calculation of the observed emission reduction in GHG emissions are the main components of the verification's scope. The registered project description/1/, the ER calculations/3/, the applied methodologies/7/, and any supporting documentation submitted by the project proponent to the verification team are used to assess the project.

During the verification, following criteria was adopted:

The project activity has been carried out and run-in accordance with the registered PD, and all the project's physical characteristics (including technology, project equipment, monitoring and metering equipment), have been put in place.

Documents are checked and verified in accordance with the most recent applicable version of the completeness checklist for requests for the issuance of VERs, verifiable, and in accordance with applicable VCS requirements. This includes the monitoring report and any other supporting documents that have been provide.

Verification of the monitoring methods and systems put in place - The actual monitoring systems and processes adhere to the authorised methodology, any revised approved monitoring plan, and the monitoring systems and procedures indicated in the monitoring.

1.3 Level of Assurance

- ☒ Reasonable Level of Assurance
- ☐ Limited Level of Assurance

Reasonable level of assurance includes the understanding that there is remote likelihood that material misstatements will not be prevented or detected on a timely basis. To achieve reasonable assurance, the auditor needs to obtain sufficient appropriate evidence to reduce audit risk to an acceptable low level.

The assessment team drafted a verification report. An independent technical review team (one or more members) conducts a second examination of the information in the report to determine if the internal policies established and implemented by Earthood were followed correctly and to produce an opinion or conclusion that complies with the relevant VCS criteria. The technical review team must collectively have the necessary technical knowledge in all of the technical fields and sectoral focuses to which the project relates. Independent from the verification team are the members of the technical review team. The technical review team members are independent of the verification team.

Additional details for how a reasonable level of assurance was achieved are specified in section 2.3 and 2.4 of this report.

1.4 Summary Description of the Project

The VCS project activity "IZMIR Landfill Gas (LFG) Capture and Utilization Project" (VCS Project ID - 2605) involves a Methane Gas Power generation plant with total installed capacity of 32.34 MWe consisting of 22 Janbacher gas engines with each engine of 1.47 MWe capacity. The project activity has planned to rehabilitate the Harmandalı Solid Waste Disposal Site which receives municipal solid waste from 23 different districts of Izmir province. The project activity is implemented by Izmir Novtek Enerji Elektrik Üretim A.Ş. over an area of 57,705 square meter in K18-D4 topographic section within acceptance boundary of Harmandalı Solid Waste Landfill Facility in Izmir Province, Çiğli District, Harmandalı Gazi Mustafa Kemal Atatürk Quarter.

The project aims to generate cleaner electricity using the power project technology and displace the amount of electricity generated using the fossil fuel-based power plant. The

electricity generated is supplied to the national grids as verified using the Power Purchase Agreement/23/.

The site audit of the project was conducted by the assessment team on 20/01/2023. The assessment team verified the details regarding the implementation operational status of the project. The details regarding the waste management site were also verified. The details regarding the technological process occurring on the site has also been verified by conducting the interviews of PP and its representatives. The technical specification of Janbacher Genset JGS 420 GS-L-L has been verified from the technical specification by technology supplier/14/ and from the registered PDD/1/. The verified technical specification are mentioned below:

Technical Specifications	
Electrical output	1470 KW
Voltage	480V-13.8kV
Thermal Output	980-1.720kW
Thermal Efficiency	Up to 43%
Fuel Type	Flexible

It has been verified that the project activity has been implemented and operational in accordance with the registered PDD/1/ and same also been verified by the photographs and video provided by the PP/21/.

The start date of the project is 25/10/2019, which is also the commissioning date of the plant, verified through the commissioning certificate/9/. The project activity has opted for 07 Years of renewal crediting period. The duration of the crediting period is 25/10/2019 to 24/10/2026, and the monitoring period for the project activity is from 25/10/2019 to 30/09/2022.

The location of the project lies between +38.532753 latitudes and +27.074458 longitude was verified through google map/14/ and found to be consistent with the data provided in the VCS PDD/1/.

During the current monitoring period, the project activity has been operational and lead to emission reduction of 2,445,711 tCO₂e and by supplying around 554,345 MWh of electricity to the national grid.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The ESPL assessed and determined whether the proposed implementation and operation of the project activity and the steps taken to report the emission reductions comply with the VCS guidelines and the criteria. The verification consists of the following three phases:

- A desk review of the VCS PD/1/ and VCS MR/2/.
- Onsite audit along with discussions on multiple occasions /8/ (by Microsoft teams and telephonic calls) follow up interviews with PP and clients.
- The resolutions of outstanding issues and issuance of the final report and opinion.

2.2 Document Review

Verification is primarily done by reviewing the documents that were submitted at different stages of assessments. As mentioned in detail in appendix 1 of this document, the documents were compared with the information mentioned in the registered VCS PD /1/ & Validation report/19/, and related documents. Internal Earthood processes carry out the evaluation in accordance with the most recent VCS criteria. Cross-checks are made between the data in the Monitoring report and the VCS PD/1/, Validation Report/19/, supporting documentation given by the PP, data from sources other than those used, and independent background checks.

Earthood conducts a desk review as under:

- Review of the data and information presented to verify their completeness.
- Review of the monitoring plan/01/, monitoring methodology/07/, relevant tool, where appropriate, applied standardized baseline, with special focus on measurement frequency, metering equipment quality (including calibration needs) and quality assurance and quality control processes.
- Analysis of data management, the quality assurance and control system in the context of their influence on the generation and reporting of emission reductions.

A list of documents reviewed during this verification are annexed as Appendix I in this report.

2.3 Interviews

The assessment team conducted a physical audit for the verification of the project activity, 'IZMIR Landfill Gas (LFG) Capture and Utilization Project. In accordance with VCS standard, v4.4/11. The audit was conducted on 20/01/2023, the PP and its representatives were interviewed in person. The questions related to the monitoring, project technology, waste management sites, data collecting, ownership, project location, site management, and QA/QC procedures were discussed. Additionally, local stakeholders were also interviewed to verify further details regarding the project activity. The table below includes information on the interviewees:

Name	Organization	Topics Covered	Team Member
Mert Karosmanoglu	Biotrend Sustainability Manager	Project implementation, start date of the project, baseline scenario, plant operation, location of the project	Shreya Garg, Ashish Yadav, Kubra Agriman, Anjali Chaudhary
Mehmet Ali Nalçacıoğlu	Biotrend Deputy General Manager	Project implementation, start date of the project, baseline scenario, plant operation, location of the project,	Shreya Garg, Ashish Yadav, Kubra Agriman, Anjali Chaudhary
Berkcan Öztürk	Biotrend Plant Manager	Plant operation, QA/QC procedure, maintenance schedule, meter details, data storage procedure, waste collection, records of waste brought to the site, calibration of the instrument installed at site, plant technology.	Shreya Garg, Ashish Yadav, Kubra Agriman, Anjali Chaudhary

Sinem Öngörü Öktem	Gaia Climate	Plant operation, QA/QC procedure, maintenance schedule, meter details, data storage procedure, waste collection, records of waste brought to the site, calibration of the instrument installed at site, plant technology	Shreya Garg, Ashish Yadav, Kubra Agriman, Anjali Chaudhary
Sevcan Yelman	Harmandalı Gazi Mustafa Kemal Village Head	Plant location, boundary	Shreya Garg, Ashish Yadav, Kubra Agriman, Anjali Chaudhary
Serdar	zmir Municipality Zero Waste Department	Waste management, waste segregation, waste transportation	Shreya Garg, Ashish Yadav, Kubra Agriman, Anjali Chaudhary
Nazım Yoldaş	Villager	Grievance Mechanism, Project implementation Employment opportunities	Kubra Agriman
Kemal Gürol	Villager	Grievance Mechanism, Project implementation Employment opportunities	Kubra Agriman
Hüseyin Yoldaş	Villager	Grievance Mechanism, Project implementation, Employment opportunities	Kubra Agriman

It was concluded that the local people were aware of the grievance register and there were no negative comments from local stakeholder's side. Instead, the local people appreciated the development and job created by the project activity in that area. This was confirmed

through the local expert who visited the site and assisted the team to confirm the information. Thus, a reasonable level of assurance was met.

2.4 Site Visits

The project activity during the current verification did undergo on-site audit, part of the team was participating online and some team members visited the site in person to achieve reasonable level of assurance. The table below describes the assessment of various topics covered:

AssessmentCriteria	Means of verification/ source documents	Assessment opinion
Description of project activity	Commissioning Certificate/9/ Technical specifications provided by technology supplier for the project activity/14/ VCS validation report Site visit conducted on 20/01/2023	The information with reference to project capacity, technology, plant equipment and commissioning dates as provided in MR/2/ and PDD/1/ are found consistent with the documents provided by the PP.
Compliance of the project implementation with the registered project description	Monthly JMR & Invoices issued by the state/16/ Geographical co-ordinates of project activity verified through Google Map/13/ VCS validation and previous verification reports /19/ Site visit/8/conducted on 20/01/2023	Monthly JMRs/16/ issued by the state indicate the following information: Name of the pooling substation, Capacity of project and name of project participant. Location of project is verified through Google Map/13/ and found consistent with registered VCS PD/1/. All the information's regarding the project implementation as discussed above are further verified

		through VCS PD/1/ and found consistent.
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	Monthly JMR & Invoices issued by the state/16/ Site visit/8/ conducted on 20/01/2023.	Compliance of monitoring plan/1/ is verified through JMR & Invoices/16/. The methods used for measuring, recording, storing, aggregating, and reporting the data on monitored parameters are verified through registered PDD/1/ and previous validation report/19/ and virtual interviews with site personnel/8/. Procedure for data uncertainty, emergency preparedness, roles and responsibility, operational and management structure are mentioned in the MR/2/ is confirmed through virtual conversations with site personnel/8/.
Compliance with the calibration frequency requirements for measuring instruments	Calibration certificates of meters/4/ Photograph of energy meters indicating sr. No, accuracy class, make /18/.	Calibration frequency and energy meter specifications (Sr. No, make, accuracy class) is verified through calibration certificates/4/ and previous VCS validation report/19/. Responsibility of calibration and maintenance of energy meters is solely under control of TEIAS/20/ this is verified through the previous validation report/19/.

Assessment of data and calculation of emission reductions or net removals	Monthly JMR & Invoices issued by the state (EPIAS)/16/	Monthly values of monitoring parameter used in ER calculation/3/ are verified through share certificates/JMRs/16/ and cross-checked from the raised invoices/16/.
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2.5 Resolution of Findings

The aim of this process is to identify, discuss, and reach a conclusion on issues related to the registered project activity's monitoring, implementation, and operations that could impair the registered project activity's ability to achieve emission reductions or influence the monitoring and reporting of emission reductions. This is based on the desk review and phone interaction with site personnel. The verification team creates and/or updates a verification protocol (internal document) that records conformities and non-conformities of various types.

Corrective Action Request (CAR) is raised if one of the following occurs:

- Non-compliance with the monitoring plan, methodology, or standardized baseline is discovered during monitoring and reporting and has not been adequately documented by project participants, or the evidence provided to prove conformity is insufficient.
- The project participants have not adequately documented changes to the implementation, operation, and monitoring of the registered project activity.
- Mistakes in applying assumptions, data, or calculations of emission reductions have resulted in an increase in the quantity of emission reductions.
- Modifications to the main indicators of sustainable development.
- The project participants have not addressed issues that were discovered in a FAR during validation that need to be verified during verification or in a prior verification.

Clarification request (CL) is issued when there is insufficient or unclear information to determine whether the applicable VCS requirements have been met. Prior to submitting a request for issuance, all CARs and CLs raised by the ESPL during verification must be rectified.

Forward Action Request (FAR) is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

During the verification, a total of 07 CLs, 03 CAR and 01 FAR were raised and successfully closed. All the findings that are raised and communicated to project participants during the verification and are included in Appendix II. The section also includes the responses provided by the project participants, along with an assessment by the verification team if it was closed out or otherwise.

The MR was revised to account for the CARs and CLs issued by Earthood, which was rechecked with the documentary evidence and was found to be inline. After reviewing the revised MR/2/ and estimated GHG emission reductions calculation sheet/3/; addressing the findings raised and outstanding concerns, final verification report and opinion was issued by Earthood.

2.5.1 Forward Action Requests

This is the first verification for the project activity. 01 FARs is raised during the current monitoring period and incorporate in Appendix-II. There are also no open FARs raised during the previous validation report/19/ applicable for the current monitoring period.

2.6 Eligibility for Validation Activities

Since no validation was performed during the current verification, this section is not applicable.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project activity is registered under VCS, with VCS ID -2605, titled “IZMIR Landfill Gas (LFG) Capture and Utilization Project” on 25/10/2019/10/. The ER's generated due to the project activity are not being claimed in any other GHG program. The VVB has independently assessed CDM registry webpage and also, checked other registries like GS and GCC for the registration of the project activity.

3.2 . Methodology Deviations

There is no methodological deviation identified during the current monitoring period.

3.3 Project Description Deviations

In the first monitoring period, the Verification team found that the LFG emission is higher than the estimated value mentioned in the MR/ ER sheet. Since, the actual emission are higher than the

estimated emissions PP has opted for project deviation. According to VCS standard v4.4/11/ paragraph 3.20.2 sub point 1; “Where the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario, the deviation shall be described and justified in a revised version of the project description. This shall include a description of when the deviation occurred, the reasons for the deviation and how the deviation impacts the applicability of the methodology, additionality and/or the appropriateness of the baseline scenario”.

Nature of landfills:

VVB would like to point that that landfill gas generation is a complex process influenced by multiple variables. The project involved rehabilitating an existing landfill site. At the time of validation emission reduction estimation was conducted as per the applied methodology that uses first order decay model and rely on assumptions and data inputs including factors related to waste characteristics, site conditions, Waste placement and compaction and landfill recovery efficiency.

Project case:

During the current monitoring the LFG captured from the project is higher than the estimated amount. The team revisited the calculation sheets from validation and took note of the methane producing capabilities of the LFG plant and compared those values to the amount of LFG produced during the monitoring period. The values in the monitoring period are within the range specified in the registered documents.

The LFG capture efficiency of 60% was used for the calculations and estimating the emission reductions. Through independent research it can be concluded that methane capture efficiency in a managed landfill can vary depending on several factors, including the landfill design, waste composition, and the implementation of gas collection systems. As research suggest that a well-managed landfills with effective gas collection systems with liners, collection efficiencies can be 90-100%./34/

Moreover, the amount of LFG captured has been monitored as per the registered monitoring plan and through a series of flow meters described in the monitoring report. Appropriateness/correctness of the monitoring devices has been elaborated in section 4.5 of the verification report.

Impact on emission reductions:

In the project the ex-post calculations of the Baseline emissions of methane from the SWDS in year is the difference between the Amount of methane in the LFG which is flared and/or used in the project activity in comparison to the baseline.

It is to be noted that the difference in the actual emission reduction vs the estimated amount can be attributed to the following factors:

1. Amount of LFG captured by the project: the VVB reviewed both the amount of LFG that was destroyed and the percentage of methane in LFG, since these factors together contribute to emission reductions. The average % of methane in LFG during the MP has ranged from 50% to 59% in different months in the monitoring period. The percentage of methane in LFG was found to be as per the norm therefore no further investigation was required. The amount of LFG was 57.90% higher than the estimated amount in the PD. There could be two reasons for the increase:
 - a. the monitoring period may have coincided with the peaking of the landfill cells. The LFG captured graph has been presented in the monitoring report however the plant has been operational from October 2019 therefore the data is not long enough to conclude the claim. The LFG captured from the start date was plotted to observe the trend, however the peaking could not be concluded.
 - b. the observed LFG capture efficiency was higher than estimated: well managed landfills can have capture efficiency of up to 100%, therefore this also could have been a reason for higher LFG captured in the monitoring period.
2. Amount of methane used to displace electricity from the grid the LFG captured from the plant is being directed for generating electricity therefore electricity that is generated from the plant is also higher than the estimated amount of electricity (for emission reduction calculation) at the time of validation. therefore, the baseline emissions from displacement of grid electricity are also higher than estimated by 30%. The electricity generation values have been checked from the publicly available data at the government site therefore the amount was not disputed.
3. Project emissions differential: at the time of validation the two project emission were considered, emissions from the use of diesel genset. PE from this category which at the time of validation were considered based on actual consumption, therefore the value in the MP is same as estimated. However the PE from electricity consumption have been 87% lower than the anticipated amount.

As explained above the actual methane captured from the plant is within the methane generating potential of the landfill site however the observed values are higher than the estimates this is being treated as a deviation. It has been demonstrated by the project developer that the LFG peaking might have coinciding with the current monitoring period however 4 years is too short a time frame to confirm the claim hence a FAR is being raised.

The higher LFG (methane) from the project activity was found acceptable since the actual methane generated was within the methane generating capacity of the landfill established at the time of validation. The higher capture does not impact the

- a) Applicability of the methodology: the project has been assessed against each condition and the higher LFG values do not cause any changes.
- b) Applicability of the baseline scenario: the baseline scenario also stands valid in case of the project activity.
- c) Additionality: the investment analysis sheet/33/ used at the time of validation were revised

and it was found from the P&L statement that the only source of revenue was the sale of electricity to the grid. The actual observed values electricity exported were inserted in the analysis. The project IRR with the new values is 8.69% against a benchmark of 20%. The value of amount of electricity to be exported from the project to the grid considered at the time of validation was higher as compared to the actual electricity exported during the monitoring period.

Therefore the VVB is able to conclude that the higher LFG production is not impact the key factors of the project however is raising a FAR to observe the LFG production in the coming months/years to establish a reason for the increase.

3.4 Grouped Project

This is not a grouped project activity. Hence, this section is Not Applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The landfill where the project is located will receive 4500 tonnes MSW each day, coming from 23 different districts of zmir province. The project activity was expected to supply 554,345 MWh (average value) of electricity to the grid during the reporting period. The project was commissioned with generation of electricity from 25/10/2019, which is regarded as the project start date. There are no changes on the key equipment and technology since the validation of the project.

In 2021, an extra blower and instrument were installed in both booster units to support increasing installed power capacity. Now, the plant capacity has reached 32.340Mwe which was proposed at the time of validation. VVB has confirmed the same from the site visit and flow diagram provided by project proponent. The actual implementation of the project during this verification period was verified in terms of name plate capacities of each gas-fired Engine / generator and monitoring equipment. The details of gas-fired Engine / generator with respect to installation and capacity have been verified to be consistent with description indicated in the Project Description/1/ & Monitoring Report/2/. The electricity generated by the project activity was supplied to the Centralized National Grid System of Turkey, which can be confirmed by the Power Purchase Agreement (PPA)/23 signed between the project owner and Turkish national grid [TEIAS]/20/.

On-site training for the related procedures including monitoring, recording and reporting was verified to be in place /15/ and their implementation was confirmed by interview with the key operators /25/ and observing the operations.

As part of the site visit, VVB confirms that the project implementation is in accordance with the project description and monitoring plan contained in the the VCS PD (version 5 dated 06/09/2022)/1/. The verification team confirmed through visual inspection and document review that all physical features of the proposed project activity including data collection systems and storage systems have been implemented in accordance with monitoring plan contained in the VCS PD (version 5.0 dated 06/09/2022).

Compliance of monitoring plan with monitoring methodology

VVB is able to confirm that the monitoring plan in the VCS PD (version 5.0 dated 06/09/2022) is in accordance with the approved methodology applied by the project activity, i.e. ACM0001 (Version 19)/7/.

Compliance of monitoring with the monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the VCS PD (version 5.0 dated 06/09/2022). VVB confirms that all parameters stated in the monitoring plan/2/are monitored and reported appropriately. All parameters required to be monitored by the monitoring plan as per the monitoring methodology ACM0001 (Version 19.0)/7/ and the management system were assessed during the site visit. The monitoring report/2/ lists each parameter required by the monitoring plan and the information flow (i.e. from data generation, aggregation, recording, calculation and reporting) for these parameters is provided. The information flow for each parameter is further verified in the following sections.

Parameters monitored.

The monitoring has been carried out in accordance with the monitoring plan contained in the registered PD /1/. The parameter BECH₄,SWDS,y - methane generation from the landfill in the absence of the project activity, is only used for ex-ante estimation the parameter FCH₄,PJ,y. In this monitoring period, the parameter FCH₄,PJ,y was ex post determined through monitoring parameters, which is consistent with the approved methodology ACM0001/7/. Thus, the parameters, including ϕ y, OX, F, DOCf, MCFy, kj, Wj,x, DOCj, fy, which determined BECH₄,SWDS,y and FCH₄,PJ,y ex-ante are not included in this report.

Parameter monitored ex post

By checking Monitor System Display Screen during site visit /8/, it is confirm by the verification team that the parameter Vt,wb have been converted automatically into normal condition (0°C and 101,325Pa) during the monitoring process, therefore, Pt and Tt are not included as separate parameters according to the registered PD. For all rest parameters, including Management of SWDS, Opj,h, EGPJ,y, TDLk,y, ECPJ,y, TDLj,y, f, vi,t,wb, Vt,wb, □PJ, CAPEX and OPEX, Tariff of electricity exported were monitored and determined as per the monitoring plan which is listed as follows:

Management of SWDS

This parameter was monitored annually by the project owner through following up with any changes in the management of Izmir Harmandalı Solid Waste Disposal Site (SWDS). Through interview with staff from Haicheng Waste Treatment Center (Haicheng landfill operation entity) and by checking the Operation Management Manual/31/ of Harmandalı Solid Waste Landfill /10/, the verification team confirmed that there was no changes in the management of the SWDS after the implementation of the project activity, which is consistent with that in the registered PD/1/ and MR/2/. Staff from Izmir Harmandalı Solid Waste Disposal Site (SWDS) was interviewed, the Operation Management Manual of Harmandalı Solid Waste Landfill was checked during site visit, and on-site inspection conducted by the local expert, all monitoring method and frequency meets the description in the PD/1/.

SDG Goal 7: Affordable and Clean Energy

The project utilizes the LFG from the Harmandalı Solid Waste Landfill site to generate electricity by gas engines. Total electricity generation supplied by the project to the grid is estimated to be 554,345MWh, which could replace the equivalent electricity from fossil fuel-based grid.

SDG 8 Decent works and Economic Growth

The project can provide permanent and full-time job opportunities over the project lifetime.

SDG 13 Affordable and Clean Energy

The project utilizes the LFG for electricity generation, which contains nearly 50% of methane, to substitute the equivalent electricity supplied by the grid.

This project adopts the renewal crediting period of 7 years. The expected average annual emission reductions are 558,124 tCO₂eq/y. Accordingly, the project is expected to generate 3,906,866 tCO₂eq emissions reduction throughout its first crediting period.

The project activity is a LFG power generation plant which is contributing to sustainable development by reducing the GHG emission, that would have been emitted from the project baseline.

Based on above, it can be concluded that the project has been implemented as described in VCSPD/1/ and no discrepancies has been found in this regard. The project has been functioning since 25/10/2019. The project will be renewal credited for 07 years. 25/10/2019–24/10/2026 is the first crediting period.

Assessment team concludes the following:

The monitoring plan is implemented completely and monitoring system (i.e., process and schedule for obtaining, recording, compiling, and analysing the monitored data and parameters) is appropriate.

There are no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description and the applied methodology/7/.

The GHG emission reductions or removals generated by the project have not included in an emissions trading program or any other mechanism that includes GHG allowance trading.

The project activity is complying with indicators for sustainable development as discussed in detail under section 1.11 of MR.

In view of the information as verified above the assessment team can conclude that the project has been implemented as described in the project description.

4.2 Safeguards

4.2.1 No Net Harm

It is confirmed that the impact is very little caused by LFG power generation on the water, surrounding ecosystem and residents. Also confirmed by checking the EIA exemption certificate/22/that was approved by Government and during site visit by local expert, Stakeholders interviewed. Furthermore, the project activity helps to improve local socio-economic development through creating employment opportunities. Hence, VVB team confirmed that the project activity does not cause any harm to environment.

4.2.2 Local Stakeholder Consultation

By checking the attendance list, the verification team confirmed that a local stakeholder consultation meeting was held on 22nd September 2021/25/ by the project proponent. Before the stakeholder consultation meeting, the project information with contact information and the stakeholder meeting notice were published through the newspaper(s), E-mail, notice at and nearby the public place on 13 September 2021 and 14 September 2021.

During the meeting, the project information and grievance mechanisms were introduced to all the stakeholders. The local stakeholders submitted their feedback through the links that were shared by the moderator during the meeting. Feedback forms for the stakeholders to provide their input were also left at the security booth at the project site entry.

Following the discussion on the Project will affect sustainable development, the audience was asked to fill out the Local Stakeholder Consultation/25/ Feedback Form. 9 of the 21 participants finished the forms that were distributed via the link.

No negative comments about the project activity were made during this monitoring period this was confirmed during the site interviews and from the booklet.

4.3 AFOLU-Specific Safeguards

This section is Not Applicable as this project activity is a non-AFOLU project activity type.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The registered PD/1/ and the monitoring report/2/ have both been followed for the project monitoring. At the site, the monitoring strategy outlined on the registered PD/1/ was being followed. The information flow (from data generation to recording, calculation, and reporting for these parameters) in the MR/2/. Also, This information flow was verified through interviews with the PP representative during the site visit/8/ and has been verified by the local expert on- site and assessed by the verification team. and the information collected during the audit shared with local expert and found in accordance with the registered PD/1/ and VCS standards/11/, VCS guidelines/12/.

According to the validated ER, it has been estimated that for the first 3 years 250,771,824 Nm³ LFG would be generated and be captured with 60% efficiency. As a result of this assumption, 150,463,094.4 Nm³ LFG would be captured and utilized in the gas engines for electricity generation. Nevertheless, that assumption does not reflect the design installed on the site. Also, in the same validation report, a 50% methane gas composition of LFG is assumed as a fixed parameter. With these values, gas engines are supposed to work with 56.55% electrical generation efficiency. PP has submitted the reference document as supportive 3. In the validated PDD, "up to 43%" efficiency has been accepted for the gas engines and 41.3% efficiency value is used in the validated ER as a typical value.

It is known that gas engine electrical generation efficiency is correlated with methane content of LFG and gross electricity generation. When gross electricity generation (554.345,28 MWh) has been compared against the total LFG destroyed in the gas engines (251,985,186 Nm³) and 52,0029% weighted average methane content of LFG as taken from real site data, a 42.42% gas engine efficiency has been reached. It is known by experience and by the literature, gas engine efficiency resides between 40 and 43%. Hence, the data shared and the relation between LFG destroyed in gas engines and electricity generation is well proven and found consistent.

It was discovered that the emissions reduction calculation was accurate. In section 4.5 of this report, a list of all the parameters' reported and verified values is provided.

In the ER sheet/3/, the PP has provided the full set of data for all the monitored parameters. The verification report's section 4.5 describes how this data was confirmed. The formulas and procedures utilized to determine the baseline emissions, project emissions, and leakage emissions are suitable and in accordance with the applicable methodology ACM0001/7/.

The calculation method and formulae used in calculating baseline emission is in compliance to the methodology used i.e., ACM0001 v19/7/. The tables mentioned in next section describes how each parameter has been verified to confirm that the actual

monitoring complies with the monitoring plan fixed ex-ante, as well as the monitored data has been thoroughly assessed and it is confirmed that the sampling requirements are met.

The details regarding the calculation of the emission reductions for the project activity can be found in the section 4.5 of the verification report.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The emission reductions produced by the project activity were based on the Solid Waste Disposal Site (SWDS) Rehabilitation and Landfill Gas (LFG) Capture's contribution to the production of energy and subsequent displacement of fossil fuels for electricity generation. The PP has provided all necessary evidence against the information related to the parameters to be monitored. The appendix I of the report contains the list of the records that were used by the assessment team for the verification of the project activity.

In order to confirm the reported values in the ER sheet/3/, the assessment team evaluated the value of the parameter found to be consistent. According to the monitoring plan outlined in the PD/1/ & MR/2/ and the monitoring methodology ACM0001/7/, the project activity is being monitored in accordance with plan. The system works well and is dependable. This section has talked about ex-ante and monitored parameter verification.

Assessment of Data and parameters:

Ex-Ante parameters:

The assessment of ex-ante parameter has been carried out as method described in below table

Means of verification	Data/Parameter	Value	VVB Assessment
	ϕ (Model correction factor to account for model uncertainties)	0.75	The value has been taken from Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site, Application A. The value is found to be consistently reported in the VCS PD/1/ and in the MR/2/.
	OXtop_layer (Fraction of methane that would be oxidized in the top layer of the SWDS in the baseline)	0.1	The value has been taken from the methodological tool 'Emissions from solid waste disposal sites' which further refers to IPCC 2006 guidelines/26/ and is found consistent with the PD/1/.
	F (Volume fraction of methane in the SWDS gas)	0.5	The value has been taken from 'Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site'/30/ and is found consistent with the PD/1/.

	MCF (Methane correction factor)	0.8		The value has been taken from the methodological tool 'Emissions from solid waste disposal sites'/30/ and is found consistent with the PD/1/.	
	DOC _f (Fraction of degradable organic carbon that can decompose)	0.5		The value has been taken from 'Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site'/30/ and is found consistent with the PD/1/.	
	DOC _j (Fraction of degradable organic carbon (by weight) in the waste type j)	Waste Type j	DOC j (% wet waste)	The value has been taken from 'Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site'/30/ and is found consistent with the PD/1/.	
		Wood and wood products	43		
		Pulp, paper, and cardboard (other than sludge)	40		
		Food, food waste, beverages, and tobacco (other than sludge)	15		
		Textiles	24		
		Garden, park, and yard waste	20		
		Glass, plastic, metal, other inert	0		
	k (Decay rate for the waste type j)	Type of Waste		Climate Zone	The value has been taken from 'Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site'/30/ and is found consistent with the PD/1/.
				Boreal and Temperate	
				(MAT ≤20 C)	
				Dry	
				(MAP/PET < 1)	
				Default	
		Slowly degrading waste	Paper/textile waste	0.04	
			Wood/straw waste	0.02	

		Moderately degrading waste	Other (non-food) organic putrescible/Garden and park waste)		0.05			
		Rapidly degrading waste	Food waste/Sewage sludge		0.06			
		Bulk Waste				0.05		
	W _{Total} (The amount of waste disposed in the landfill sites in year x)	Year	W _{total} (t/y)	Year	W _{total} (t/y)	Year	W _{total} (t/y)	These values are taken from the Historical waste data and waste projections and found consistent with the PD/1/.
		1992	879,802	2019	1,830,183	2031	2,534,408	
		1993	903,997	2020	1,880,513	2032	2,604,104	
		1994	928,857	2021	1,932,227	2033	2,675,717	
		1995	954,400	2022	1,985,363	2034	2,749,299	
		1996	980,646	2023	2,039,961	2035	2,824,905	
		1997	1,007,614	2024	2,096,060	2036	2,902,590	
		1998	1,035,324	2025	2,153,701	2037	2,982,411	
		1999	1,063,795	2026	2,212,928	2038	3,064,427	
		2000	1,093,049	2027	2,273,784	2039	3,148,699	
		2001	1,123,108	2028	2,336,313	2040	3,235,288	
		2002	1,153,994	2029	2,400,561	2041	3,324,259	
		2003	1,185,728	2030	2,466,577	2042	3,415,676	
		2004	1,218,336					
		2005	1,251,840					
		2006	1,286,266					
		2007	1,321,638					
		2008	1,357,983					
		2009	1,395,328					
		2010	1,433,699					
		2011	1,473,126					

		2012	1,513,637					
		2013	1,555,262					
		2014	1,598,032					
		2015	1,641,977					
		2016	1,687,132					
		2017	1,733,528					
		2018	1,781,200					
	GWP _{CH4} (Global Warming potential of methane)	28 tCO ₂ e/ tCH ₄						
	EFCO _{2,grid,y} (Emission factor for the Turkish National Grid)	0.5706 tCO ₂ e/MWh						
	TDL _{j,y} (Average technical transmission and distribution losses for providing electricity to source j in year y)	0.11						
	SPECflare	- Combustion range: 25-50% methane - Combustion temperature 850 - 1200 °C - Operating logic managed by PLC. - Designed for combustion of 300 m³/h of biogas. (Flow range 50 to 1500 m³/h) - Flame retention >0.3 sec						
	p CH ₄ , n	0.716						

			project activity. This value is fixed for calculating baseline emissions.
Findings	CL#04 is raised and successfully resolved.		
Conclusion	The ex-ante parameters mentioned in the MR/2/ are cross-checked in reference to the registered VCS PD/1/ and, are found to be consistent.		

Ex-Post Parameters:

The following monitored parameters have been verified for the current monitoring period:

Parameter	Management of SWDS (Management of SWDS)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Annually
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	N/A
	Monitoring equipment	N/A
	Calibration frequency /interval:	N/A
	How were the values in the monitoring report verified?	N/A
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable

	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	
Conclusion	The parameter is found to be appropriate. The parameter was used to calculate the baseline emissions of the project activity.	

Parameter	EGPJ,y (Amount of electricity generated using LFG by the project activity in year y)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Continuous measurement in every 10 minutes all year.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	2019 (25/10/2019-31/12/2019): 16,757.68 MWh 2020: 156,915.8 MWh 2021: 213,292.36 MWh 2022:(01/01/2022-30/09/2022):167,378.82 MWh
	Monitoring equipment	The main monitoring device for the measurement of electricity consumption is the main meter. Type – Electricity meter Accuracy Class - C Serial number – 84260488 Calibration frequency – 10 years Date of calibration – 14/10/2019 Validity – 14/10/2029
	Calibration frequency /interval:	Every 10 Years.
	How were the values in the monitoring report verified?	The value was checked against the JMR and invoices/16/ raised by PP
	If applicable, has the reported data been cross-checked with other available data?	The values reported have been cross checked against the JMR and invoices/16/ raised by PP
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reduction management. QA/QC processes are in place.
Findings	CAR#03 is raised and resolved.	

Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded every 10 mins. as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PDMR/1/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.
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Parameter	EC _{PJ,y} (Amount of electricity consumed by the project activity in year y)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Recorded every month.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	2019: 933 MWh 2020: 8,572 MWh 2021: 12,175 MWh 2022(01/01/2022-30/09/2022): 10,493 MWh
	Monitoring equipment	The main monitoring device for the measurement of electricity consumption is the main meter. Type – Electricity meter Accuracy Class - C Serial number – 84260488 Calibration frequency – 10 years Date of calibration – 14/10/2019 Validity – 14/10/2029
	Calibration frequency /interval:	10 Years
	How were the values in the monitoring report verified?	The value was checked against JMR/16/ provided by PP
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.

Findings	CL#05 is raised and resolved.
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PDMR/1/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.

Parameter	O _{pi,h} (Operation of the equipment that consumes the LFG)			
Means of verification	Criteria/Requirements	Assessment/Observation		
	Measuring /Reading /Recording frequency	Recorded Hourly		
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.		
	Value(s) Applied	Year	Total operation time (hours)	
		2019 (25/10/2019-31/12/2019)	1,037.801	
		2020	8,164.298	
		2021	7,332.422	
		2022 (01/01/2022-30/09/2022)	5,181.345	
	Monitoring equipment	Flare Program logic controller		
	Calibration frequency /interval:	NA		
	How were the values in the monitoring report verified?	The value was checked against flow meter data provided by PP.		
	If applicable, has the reported data been cross-checked with other available data?	NA		
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable		
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.			
Findings	No findings were raised			

Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/2/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.
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Parameter	V _{i,t,wb} : m ³ gas i/m ³ (Volumetric fraction of greenhouse gas i in a time interval t on a wet basis)			
Means of verification	Criteria/Requirements	Assessment/Observation		
	Measuring /Reading /Recording frequency	Continuous measurement and hourly recording.		
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.		
	Value(s) Applied	2019(25/10/2019-31/12/2019): 0.5685(average) 2020: 0.5723(average) 2021: 0.5716(average) 2022(01/01/2022-30/09/2022): 0.5250(average)		
	Monitoring equipment	Infrared Gas analyzer		
		Model	Serial Number	Calibration Date
		SWG100 Biogas	081008	06/01/2022
		SWG100 Biogas	081088	06/01/2022
		OPTIMA7 BIO	319231	07/11/2022
		OPTIMA7 BIOGAS	322252	18/04/2022
	Calibration frequency /interval:	NA		
	How were the values in the monitoring report verified?	The value was checked against Gas analyzer details provided by PP/14/.		
	If applicable, has the reported data been cross-checked with other available data?	NA		
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable			
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.			
Findings	No findings were raised			

Conclusion	The VVB has observed a delay in calibration of the flow meters, the calibration frequency of is thus not inline with the registered monitoring plan. As a corrective action for the delay period an error factor of 3% is applied for continuous measurement gas analyzers in line with the requirements of paragraph 366(a) of CDM Validation and Verification Standard version 03, "Applying the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration, if the results of the delayed calibration do not show any errors in the measuring equipment, or if the error is smaller than the maximum permissible error".
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Parameter	CAPEX and Opex: Currency (TL) (Total investment to implement the project and total cost to operate the project).	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	At the first issuance request after each phase of the project is fully implemented.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	CAPEX: 2019: 66,237,137.11 TL 2020: 26,165,272.6 TL 2021: 5,936,834.835 TL 2022: 59,311,994 TL OPEX: 2019: 1,388,4887.89 TL 2020: 236,061,049.88 TL 2021: 173,161,775 TL 2022: 299,862,957 TL
	Monitoring equipment	NA
	Calibration frequency /interval:	NA
	How were the values in the monitoring report verified?	The value was checked against financial invoices/16/ provided by PP
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	NA

	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD&MR/1/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	Tariff or Electricity Exported: Currency- Lira (Tariff of Electricity Exported).	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	At the first issuance request after each phase of the project is fully implemented
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	13.3 \$/kWh
	Monitoring equipment	NA
	Calibration frequency /interval:	NA
	How were the values in the monitoring report verified?	The value was checked against power purchase agreement/23/ provided by PP.
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	

Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring of this parameter is only required for projects applying the simplified procedures to identify the baseline scenario. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PDMR/1/.		
Parameter	V,t,db: m ³ gas / hours (Volumetric flow of the gaseous stream in time interval t on a wet basis)		
Means of verification	Criteria/Requirements	Assessment/Observation	
	Measuring /Reading /Recording frequency	Continuous measurement and hourly recording	
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR.	
	Value(s) Applied	2019(25/10/2019-31/12/2019): 3,879.51(avg.) 2020: 8,527.65(avg.) 2021: 8,900.19(avg.) 2022(01/01/2022-30/09/2022): 13,200.85(avg.)	
	Monitoring equipment	The main monitoring device for the measurement of gaseous stream are flow meters.	
		Model	Serial Number
		Deltabar S PMD75	NB00BB0109D
		Deltabar S PMD75	NB00BD0109D
		Deltabar S PMD75	P707E70109D
		Deltabar S PMD75	P707E80109D
		Deltabar S PMD75	P707E90109D
		Deltabar S PMD75	P707EA0109D
	Calibration frequency /interval:	Every 1-4 years, Interval is depending on extremities of environment.	
	How were the values in the monitoring report verified?	The value was checked against metering details provided by PP.	
	If applicable, has the reported data been cross-checked with other available data?	NA	
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable	

	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management. These are the aggregated values of Booster 1&2.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/2/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	T: °C(Temperature of the gaseous stream in time interval t)		
Means of verification	Criteria/Requirements	Assessment/Observation	
	Measuring /Reading /Recording frequency	Continuous measurement and hourly recording	
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/1/.	
	Value(s) Applied	2019(25/10/2019-31/12/2019): 33.45 2020: 48.48 2021: 49.06 2022(01/01/2022-30/09/2022): 54.79	
	Monitoring equipment	Temperature sensors of booster units 1&2.	
		Flowmeter Model	Serial Number Calibration Date

		Deltabar S PMD75	NB00BB0109 D	13-11-2018
		Deltabar S PMD75	NB00BD0109 D	14-11-2018
		Deltabar S PMD75	P707E70109 D	07-08-2019
		Deltabar S PMD75	P707E80109 D	07-08-2019
		Deltabar S PMD75	P707E90109 D	07-08-2019
		Deltabar S PMD75	P707EA0109 D	07-08-2019
	Calibration frequency /interval:	NA		
	How were the values in the monitoring report verified?	The value was checked against Gas analyzer details provided by PP.		
	If applicable, has the reported data been cross-checked with other available data?	NA		
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable		
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.		
Findings	No findings were raised			
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/2/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.			

Parameter	P: Pa (Pressure of the gaseous stream in time interval t)		
Means of verification	Criteria/Requirements	Assessment/Observation	
	Measuring /Reading /Recording frequency	Continuous measurement and hourly recording	
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR.	
	Value(s) Applied	2019(25/10/2019-31/12/2019): 88,283.03 2020: 91,556.09 2021: 90.972.10	
		2022(01/01/2022-30/09/2022): 82,997.07	
	Monitoring equipment	The main monitoring device for the measurement of Pressure is Pressure sensors of booster unit 1&2.	
		Model	Serial Number
		Deltabar S PMD75	NB00BB0109
		Deltabar S PMD75	NB00BD0109D
		Deltabar S PMD75	P707E70109D
		Deltabar S PMD75	P707E80109D
		Deltabar S PMD75	P707E90109D
		Deltabar S PMD75	P707EA0109D
	Calibration frequency /interval:	Calibration in every 1-4 years, depending on extremities of environment.	
	How were the values in the monitoring report verified?	The value was checked against Flow meter details provided by PP/28/.	
	If applicable, has the reported data been cross-checked with other available data?	NA	
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable	

	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management. These are the average values of booster 1&2.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/2/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	FC _{i,j,y} Tc/ mass unit of the fuel (Weighted average mass fraction of carbon in fuel type i in year y)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Only valid for first monitoring period
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	NA
	Monitoring equipment	NA
	Calibration frequency /interval:	NA
	How were the values in the monitoring report verified?	It is in accordance with the tool-3 "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" version 03.0.
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by	Not Applicable

	Appendix 1 to the CDM Project Standard?	
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/2/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	W _{c,i,y} mass unit/ volume unit(Weighted average density of fuel type i in year y)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Only valid for first monitoring period.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	NA
	Monitoring equipment	NA
	Calibration frequency /interval:	NA
	How were the values in the monitoring report verified?	It is in accordance with the tool-3 "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" version 03.0/35/.
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.

Findings	No findings were raised
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/2/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.

Parameter	$\rho_{i,y}$ (Weighted average density of fuel type i in year y).	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Only valid for first monitoring period.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/..
	Value(s) Applied	NA
	Monitoring equipment	NA
	Calibration frequency /interval:	NA
	How were the values in the monitoring report verified?	It is in accordance with the tool-3 "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" version 03.0./35/
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PDMR/1/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	NCV _{i,y} (Weighted average net calorific value of fuel type i in year y)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Only valid for first monitoring period.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	NA
	Monitoring equipment	NA
	Calibration frequency /interval:	NA
	How were the values in the monitoring report verified?	It is in accordance with the tool-3 "Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion" version 03.0./35/
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PDMR/1/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	EF _{CO₂,i,y} (Weighted average CO ₂ emission factor of fuel type i in year y)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Measured at the time of fuel delivery.

	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the PDMR/01/.
	Value(s) Applied	74,100
	Monitoring equipment	NA
	Calibration frequency /interval:	NA
	How were the values in the monitoring report verified?	The value was checked against IPCC report/26/.
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/2/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	F _{CH4,EG,t} (Mass flow of methane in the exhaust gas of the flare on a dry basis at reference conditions in the time period t)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Only valid for first monitoring period.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	0
	Monitoring equipment	NA

	Calibration frequency /interval:	NA
	How were the values in the monitoring report verified?	The value was checked against flare meter details and ER sheet/3/ provided by PP
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PDMR/1/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	T _{EG,m} (Temperature in the exhaust gas of the enclosed flare in the minute m).	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Once per minute if the flare is 100% operated.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	0
	Monitoring equipment	NA
	Calibration frequency /interval:	NA
	How were the values in the monitoring report verified?	The value was checked against Monitoring report provided by PP.
	If applicable, has the reported data been cross-checked with other available data?	NA

	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/2/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	vi, RG, m (Volumetric fraction of component i in the residual gas on a dry basis in the minute m where i = CH ₄ , CO ₂ , O ₂ , H ₂ S, N ₂).		
Means of verification	Criteria/Requirements	Assessment/Observation	
	Measuring /Reading /Recording frequency	Continuously.	
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.	
	Value(s) Applied	NA	
	Monitoring equipment	Gas analyzer	
		Model	Serial Number
		SWG100 Biogas	081008
		SWG100 Biogas	081088
		OPTIMA7 BIO	319231
		OPTIMA7 BIOGAS	322252
	Calibration frequency /interval:	Periodically calibrated	
	How were the values in the monitoring report verified?	NA	
	If applicable, has the reported data been cross-checked with other available data?	NA	

	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/2/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	V _{RG,m} (Volumetric flow of the residual gas on a dry basis at reference conditions in the minute m).	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Continuously
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	2019 (25/10/2019-31/12/2019): 0 2020: 0 2021: 0 2022(01/01/2022-30/09/2022): 0
	Monitoring equipment	Gas analyzer
	Calibration frequency /interval:	Periodically calibrated
	How were the values in the monitoring report verified?	The value was checked against calibration certificate/4/ and calculated ER sheet/3/ provided by PP
	If applicable, has the reported data been cross-checked with other available data?	NA

	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/2/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	MR _{RG,m} (Mass flow of the residual gas on a dry basis at reference conditions in the minute m).	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Continuously.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	NA
	Monitoring equipment	Flow meter, Pressure and Temperature Transmitters.
	Calibration frequency /interval:	Continuously
	How were the values in the monitoring report verified?	NA
	If applicable, has the reported data been cross-checked with other available data?	NA

	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/1/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	VO _{2,EG,m} (Volumetric fraction of O ₂ in the exhaust gas on a dry basis at reference conditions in the minute m).	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Continuously.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	NA
	Monitoring equipment	Gas analyzer
	Calibration frequency /interval:	Continuously
	How were the values in the monitoring report verified?	NA
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable

	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PDMR/1/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameter	fc _{CH4,EG,m} (Concentration of methane in the exhaust gas of the flare on a dry basis at reference conditions in the minute m).	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Continuously.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	0
	Monitoring equipment	NA
	Calibration frequency /interval:	Periodically
	How were the values in the monitoring report verified?	The value was checked against MR/2/ and ER sheet/3/ provided by PP.
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	

Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/1/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.
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Parameter	Flame _m (Flame detection of flare in the minute m)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Continuously
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/02/.
	Value(s) Applied	0
	Monitoring equipment	Flame timer
	Calibration frequency /interval:	Continuously
	How were the values in the monitoring report verified?	The value was checked against MR/2/ and ER sheet/3/ provided by PP.
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	

Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/ & MR/1/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.
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Parameter	Maintenance _y (Maintenance events completed in year y).	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Annually
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The frequency is in line with the MR/2/.
	Value(s) Applied	NA
	Monitoring equipment	Logbook
	Calibration frequency /interval:	NA
	How were the values in the monitoring report verified?	The value was checked against logbook and site visit.
	If applicable, has the reported data been cross-checked with other available data?	NA
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management.
Findings	No findings were raised	

Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The verification team is able to confirm that the project is implemented as per the registered PD and there is no discrepancy observed between the actual monitoring system and the monitoring plan set out in the project description and the applied methodology outlined in the registered VCS PD/1/&MR/2/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.
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Calculation of Emission Reductions

The emission reductions have been computed using the following formula in accordance with the applied methodology ACM0001 "Flaring or use of landfill gas 6," version 19/7/:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y = Emission reductions in year y

(tCO₂e/yr)

BE_y = Baseline emissions in year y

(tCO₂e/yr)

PE_y = Project emissions in year y

(tCO₂e/yr)

LE_y = Leakage emissions in year y

(tCO₂e/yr) For BE_y ;

$$BE_y = BE_{CH_4,y} + BE_{EC,y}$$

Emissions from methane from the SWDS;

$$BE_{CH_4} = ((1 - OX_{toplayer}) \times F_{CH_4,PJ,y} - F_{CH_4,BL,y}) \times GWP_{CH_4}$$

Year	$F_{CH_4,PJ,y}$ (tCH ₄)	$F_{CH_4,BL,y}$ (tCH ₄)	GWP_{CH_4} (tCO ₂ e/tCH ₄)	$BE_{CH_4,y}$ (tCO ₂ e/yr)
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2019	4,641.89	0	28	116,975
2020	23,752.51	0	28	598,563
2021	25,781.61	0	28	649,696
2022	29,753.11	0	28	749,778

Project emissions are calculated by the below equation:

$$PE_y = PF_{EC,y} + PF_{FC,y} + PF_{DT,y} + PF_{SP,y}$$

Project emissions from consumption of electricity by the project activity ($PE_{EC,y}$) are calculated as follows:

$$PE_{EC,y} = \sum EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y})$$

Year	2019	2020	2021	2022
EC PJ,j,y	933.0	8,572.4	12,175.0	10,492.6
PE EC,y	590.9	5,429.5	7,711.2	6,645.6
PE	605.7	5,431.6	7,713.0	6,651.6

Baseline Emissions:

The baseline emissions include the CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity, multiplying the electricity supplied to the grid (MWh) with the combined margin CO₂ emission factor for grid connected power generation in y.

$$BE_y = BE_{CH_4,y} + BE_{EC,y} + BE_{HG,y} + BE_{NG,y}$$

$$BE_y = 2,115,012 + 351,102 + 0 + 0 = 2,466,114 \text{ tCO}_2$$

Year	$BE_{CH_4,y}$ (tCO ₂ e)	$BE_{EC,y}$ (tCO ₂ e)	Baseline Emission (tCO ₂ e)
(25-10-2019 - 31-12-2019)	116,975	10,613	127,588
2020	598,563	99,385	697,948
2021	649,696	135,092	784,788
(01-01-2022 - 30-09-2022)	749,778	106,012	855,790

Where:

BE = Baseline emissions in year y (tCO₂e/yr)

$BE_{CH_4,y}$ = Baseline emissions of methane from the SWDS in year y (tCO₂e/yr)

$BE_{EC,y}$ = Baseline emissions associated with electricity generation in year y (tCO₂/yr)
 $BE_{HG,y}$ = Baseline emissions associated with heat generation in year y (tCO₂/yr)
 $BE_{NG,y}$ = Baseline emissions associated with natural gas use in year y (tCO₂/yr)

Baseline emissions of methane from the SWDS ($BE_{CH_4,y}$)

$$BE_{CH_4} = ((1 - OX_{top_layer}) \times F_{CH_4,Pj,y} - F_{CH_4,BL,y}) \times GWP_{CH_4}$$

Where:

$BE_{CH_4,y}$ = Baseline emissions of methane from the SWDS in year y (tCO₂e/yr)

OX_{top_layer} = Fraction of methane in the LFG that would be oxidized in the top layer of the SWDS in the baseline (dimensionless)

$F_{CH_4,Pj,y}$ = Amount of methane in the LFG which is flared and/or used in the project activity in year y (tCH₄/yr)

$F_{CH_4,BL,y}$ = Amount of methane in the LFG that would be flared in the baseline in year y (tCH₄/yr)

GWP_{CH4} = Global warming potential of

$CH_4(tCO_2e/tCH_4)$

$$BE_{CH_4} = ((1-0.1)*83,929.11-0)*28 = 2,115,012 \text{ tCO}_2$$

Ex post determination of $F_{CH_4,PJ,y}$

$$F_{CH_4,PJ,y} = F_{CH_4,flared,y} + F_{CH_4,EL,y} + F_{CH_4,HG,y} + F_{CH_4,NG,y}$$

Where,

$F_{CH_4,PJ,y}$ = Amount of methane in the LFG which is flared and/or used in the project activity in year y (tCH₄/yr)

$F_{CH_4,flared,y}$ = Amount of methane in the LFG which is destroyed by flaring in year y (tCH₄/yr)

$F_{CH_4,EL,y}$ = Amount of methane in the LFG which is used for electricity generation in year y (tCH₄/yr)

$F_{CH_4,HG,y}$ = Amount of methane in the LFG which is used for heat generation in year y (tCH₄/yr)

$F_{CH_4,NG,y}$ = Amount of methane in the LFG which is sent to the natural gas distribution network and/or dedicated pipeline and/or to the trucks in year y (tCH₄/yr)

Ex ante estimation of $F_{CH_4,PJ,y}$

$$F_{CH_4,PJ,y} = F_{CH_4,flared,y} + F_{CH_4,EL,y} + F_{CH_4,HG,y} + F_{CH_4,NG,y}$$

Where:

$F_{CH_4,PJ,y}$ = Amount of methane in the LFG which is flared and/or used in the project activity in year y (tCH₄/yr)

$F_{CH_4,flared,y}$ = Amount of methane in the LFG which is destroyed by flaring in year y (tCH₄/yr)

$F_{CH_4,EL,y}$ = Amount of methane in the LFG which is used for electricity generation in year y (tCH₄/yr)

$F_{CH_4,NG,y}$ = Amount of methane in the LFG which is sent to the natural gas distribution network and/or dedicated pipeline and/or to the trucks in year y (tCH₄/yr)

The working hours of the gas engines are monitored, and no emission reduction should be claimed for methane destruction during non-working hours.

The project utilizes the LFG only for power generation. Therefore:

$$F_{CH4,PJ,y} = F_{CH4,EL,y}$$

$$F_{CH4,PJ,y} = 83,929.11$$

Baseline emissions associated with electricity generation (BEEC,y)

$$BE_{EC,y} = \sum EC_{BL,k,y} \times EF_{EL,k,y} \times (1 + TDL_{k,y})$$

Where,

$EC_{BL,k,y}$ = Net amount of electricity generated using LFG in year y (MWh/yr)

$EF_{EL,k,y}$ = Emission factor for electricity generation for source k in year y (tCO₂/MWh)

$TDL_{k,y}$ = Average technical transmission and distribution losses for providing electricity to source k in year y

k = Sources of electricity generated in the
baseline

$$BE_{EC,y} = 554,344.7 \times 0.5706 \times (1 + 0.11) = 351,102$$

Project emissions:

Project emissions are calculated as follows:

$$PE_y = PE_{EC,y} + PE_{FC,y} + PE_{DT,y} + PE_{SP,y} + PE_{FC,j,y} + PE_{flare,y}$$

Where:

PE_y = Project emissions in year y (tCO₂/yr)

$PEEC,y$ = Emissions from consumption of electricity due to the project activity in year y (tCO₂/yr)

$PEFC,y$ = Emissions from consumption of fossil fuels due to the project activity, for purpose otherthan electricity generation, in year y (tCO₂/yr)

$PEDT,y$ = Emissions from the distribution of compressed/liquefied LFG using trucks, in year y(tCO₂/yr)

$PESP,y$ = Emissions from the supply of LFG to consumers through a dedicated pipeline, in year y (tCO₂/yr)
 $PEFC,j,y$ = Are the CO₂ emissions from fossil fuel combustion in process j during the year y (tCO₂/yr)

$PEflare,y$ = Project emissions from flaring of the residual gas in year y

The project does not involve the distribution of compressed/liquefied LFG using trucks nor pipelines. Therefore, $PEDT,y$, $PESP,y$, will be 0. Hence, PE_y will be equal to $PEEC,y + PEFC,y$.

$$PE_y = 20,377.2 + 24.62 = 20,401.8$$

$$PE_{EC,y} = \sum_j EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y})$$

PE_y = Project emissions in year y (tCO₂/yr)

$PEEC,y$ = Emissions from consumption of electricity due to the project activity in year y (tCO₂/yr)

$PEFC,y$ = Emissions from consumption of fossil fuels due to the project activity, for purpose otherthan electricity generation, in year y (tCO₂/yr)

$PEDT,y$ = Emissions from the distribution of compressed/liquefied LFG using trucks, in year y(tCO₂/yr)

$PESP,y$ = Emissions from the supply of LFG to consumers through a dedicated pipeline, in year y(tCO₂/yr)

$PEFC,j,y$ = Are the CO₂ emissions from fossil fuel combustion in process j during the year y(tCO₂/yr)

$PEflare,y$ = Project emissions from flaring of the residual gas in year y

The project does not involve the distribution of compressed/liquefied LFG using trucks nor pipelines. Therefore,

$$PEEC,Y = 32,172.9 \times 0.5706 \times (1 + 0.11) = 20,377.2$$

Electricity generation have been crosschecked from, website of the transparency platform of the Energy Market Regulatory Authority (EPİAS)¹ with the selection of time period and plant name (ZMR ÇÖP GAZ ELKTRİK ÜRETİM TESİSİ).

Project emissions from fossil fuel combustion

$$PE_{FC,j,y} = \sum_j FC_{PJ,j,y} \times COEF_{i,y}$$

Where:

$PE_{FC,j,y}$ = Are the CO₂ emissions from fossil fuel combustion in process j during the year y (tCO₂/yr)

$FC_{PJ,j,y}$ = Is the quantity of fuel type i combusted in process j during the year y (mass or volumeunit/yr)

$COEF_{i,y}$ = Is the CO₂ emission coefficient of fuel type i in year y (tCO₂/mass or volume unit)

I = Are the fuel types combusted in process j during the year y

$COEF = 0,00268 \text{ tCO}_2/\text{L} \times \text{fuel}$

Project emissions from flaring

$$F_{CH_4,RG,t} = V_{t,db} \times V_{CH_4,wb,t} \times \rho_{CH_4,n}$$

Where:

$F_{CH_4,RG,t}$ = Mass flow of greenhouse gas (CH₄) in the gaseous stream in time interval t (kggas/h)

$V_{t,db}$ = Volumetric flow of the gaseous stream in time interval t on a dry basis (m³dry gas/h)

$V_{CH_4,wb,t}$ = Volumetric fraction of ghg CH₄ in the gaseous stream in a time interval t on a dry basis (m³ gas i/m³dry gas)

$\rho_{CH_4,n}$ = Density of ghg CH₄ in the gaseous stream at normal conditions t (kggasi/m³gasi)

¹ <https://seffaflik.epias.com.tr/transparency/uretim/yekdem/lisansli-uretim-miktari/yekdem-lisansli-gercek-zamanli-uretim.xhtml>

$$PE_{Flare,y} = GWP_{CH4} \times \sum_{m=1}^{525600} F_{CH4,RG,m} \times (1 - \eta_{flare,m}) \times 10^{-3}$$

Where:

$PE_{flare,y}$ = Project emissions from flaring of the residual gas in year y (tCO₂e)

GWP_{CH4} = Global warming potential of methane valid for the commitment period (tCO₂e/tCH₄)

$F_{CH4,RG,m}$ = Mass flow of methane in the residual gas in the minute m (kg)

$\eta_{flare,m}$ = Flare efficiency in the minute m

Since the commission date the working hours of flare have been in zero (please refer to excel sheet 'compiled data SD storage system Harmandali 2019/2020/2021/2022' attached, Parameter flare working hours and Hour meter Flare can be read directly for crosschecking.

Therefore:

Flare working hours (h) = 0

$PE_{flare,y}$ (tCO₂e) = 0

$PEFC,j,y$ = 0

Leakage emissions:

The leakage emissions are assumed to be zero as per the ACM0001 version 19/7/ as defined in the registered VCS PD/1/.

The data presented in the monitoring report/2/ were assessed by reviewing in detail project documentation, collection of monitored data, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. Sufficient evidence was presented and verified by Earthood for the reported emission reductions.

The ERs achieved during the current monitoring period are higher than the ERs estimated for the corresponding period as per the VCS PD/1/, VVB has included the detailed assessment of the causes pertaining to increased ERs under section 3.3 of this report. Thus, assessment team is of the opinion that the higher ERs achieved were due to trends not anticipated during the validation.

4.6 Non-Permanence Risk Analysis

There is no non-performance risk rating determined by the project proponent.

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5 VERIFICATION OPINION

Earthood Services Private Limited (ESPL) was contracted by Gaia Finansal Danismanlik Hizmetleri A.Ş to perform the independent verification of the emission reductions for the VCS project activity “IZMIR Landfill Gas (LFG) Capture and Utilization Project” (VCS ID-2605) in Turkey for the monitoring period 25/10/2019 to 30/09/2022 as reported in the Monitoring Report Version 11 dated 12/06/2023. Gaia Finansal Danismanlik Hizmetleri A.Ş is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

Earthood commenced the verification based on the baseline and approved methodology ACM0001v19.0/7/, the monitored plan contained in the VCS PD/1/ & MR/2/, VCS standard /11/ and VCS guidelines/12/ as per the process described under section 2 of this report.

Understanding the risks involved with reporting GHG emission data and the measures in place to reduce them forms the foundation of the Earthood verification process. By gathering documentation, additional data, and justifications that Earthood deemed required to provide a reasonable level of assurance that reported GHG emission reductions are accurately stated, ESPLplanned and carried out the verification.

The verification team can confirm that:

- the project is implemented and operated as per the VCS PD.
- the monitoring plan in VCS PD is as per the applied methodology
- the monitoring complies with the monitoring plan in the VCS PD.
- the monitoring report and other supporting documents provided are complete and verifiable andinaccordance with the applicable VCS Version 4 and CDM requirements
- the installed equipment being essential for generating emission reduction runs reliably and iscalibrated appropriately.
- the monitoring system is in place and generates GHG emission reductions data
- the GHG emission reductions are calculated without material misstatements.

In our opinion the GHG emissions reductions reported for the project activity for the monitoring period 25/10/2019 to 30/09/2022 are fairly stated in the Monitoring Report/2/.

The GHG emissionreductions were calculated correctly on the basis of the approved baseline and monitoring methodologies ACM0001 v19.0/7/.

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO2e)	Project emissions or removals (tCO2e)	Leakage emissions (tCO2e)	Net GHG emission reductions or removals (tCO2e)
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2019	127,588	606	-	126,982
2020	697,948	5,432	-	692,516
2021	784,788	7,713	-	777,075
2022 (01/01/2022- 30/09/2022)	855,790	6,652	-	849,138
Total	2,466,114	20,403	-	2,445,711

Approved by



Dr. Kaviraj Singh
Managing Director
Earthood Services Private Limited

Place: Gurugram
Date: 27/07/2023

APPENDIX I: DOCUMENT REFERENCES

S.No	Title of Document	Version	Date
1.	Registered PD	05	
2.	VCS Monitoring Report (25/10/2019 to 30/09/2022)	11	12/06/2023

3.	ER spread sheet	-	Corresponding to MR
4.	-Manufacturer calibration certificate for the energy meters -Subsequent certificates of calibration for all energy meters	-	Various
5.	Generation license	-	12/09/2019
6.	Plant Records/Logbooks/DCS record for the duration of monitoring period (01/04/2018 to 30/09/2020)	-	-
7.	Approved ACM0001 "Flaring or use of Landfill gas 6"	19	-
8.	Audit through local expert, recorded through video call	-	20/01/2023
9.	Commissioning certificate	-	-
10.	VCS webpage for the project, https://registry.verra.org/app/projectDetail/VCS/2605	-	Last accessed on 10/02/2023
11.	VCS Standard	4.4	Last accessed on 22/01/2023
12.	VCS Program Guide	4.2	Last accessed on 26/09/2022
13.	Google Earth desktop/Mobile application	-	Last accessed on 13/12/2022
14.	Technical Specifications by technology supplier	-	-
15.	Skill development training records	-	-
16.	JMR & Invoices	-	-
17.	Copy of grievance register/suggestion box placed at site office	-	03/08/2022
18.	Latest photographs of energy meters installed at site	-	-
19.	Validation Report		
20.	TEIAS web page: https://webapi.teias.gov.tr/file/037a54ff-0964-46b5-84ff-375ab6c285dc?download	-	September 2008
21.	Photographs and videos of the plant site	-	20/01/2023
22.	EIA Report	-	24/11/2021
23.	Power Purchase Agreement	-	-
24.	Regulation on Increasing Efficiency in the Use of Energy Resources and Energy	-	-
25.	Local Stakeholder Consultation		22/09/2021
26.	IPCC Guidelines for National Greenhouse Gas Inventorie.		2006
27.	Agreement on connection to the distribution		31/05/2021
28.	Technical datasheet		27/05/2020
29.	Diesel Generator Records		23/09/2021-05/08/2021

30.	Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site, Application A.	3.0	
31.	Booster Manual	-	-
32	https://data.tuik.gov.tr/Bulten/Index?p=The-Results-of-Address-Based-Population-Registration-System-2022-49685&dil=2	-	-
33	Revised IRR sheet. (changes were made to access the impact)	--	-
34	https://www.tandfonline.com/doi/full/10.1080/20430779.2012.730798#:~:text=For%20closed%20landfills%2C%20reported%20efficiencies,emission%20reporting		Last viewed on 12/06/2023
35	Tool-3 Tool to calculate project or leakage CO2 emission from fossil fuel combustion	03.0	

APPENDIX II: FINDINGS OVERVIEW

Table 1.FAR for this verification

FAR ID	01	Section no.	3.3	Date : 12/06/2023
Description of FAR				
The amount of LFG captured from the landfill is 57.90% higher than the estimated value, PP is request to observe the values in coming years and establish the reason for the increase. The verifying VVB to revisit the reasons provided.				
Project Developer response				Date : DD/MM/YYYY
Documentation provided by project Developer				
VVB assessment				Date: DD/MM/YYYY

Table 2.CL from this verification

CL ID	01	Section no.	MR	Date: 18/11/2022
Description of CL				
The following document is required - 450 kVA Alimar Diesel Generator data sheets. - Employment generation certificates. - Supporting document (s) for SDG 6.1 (SDG target).				
Project Proponent response				Date: 20/12/2022
Data sheets have been provided. Employment records are provided. Project will contribute to SDGs 7, 8 and 13. Table had extra information which has been removed.				
Documentation provided by project Proponent				

VVB assessment	Date: 06/01/2023
VVB has confirmed that PP has submitted all the documents and are satisfactory. Hence, CL#01 is closed.	

CL ID	02	Section no.	5.1	Date : 18/11/2022
Description of CL				
PP is requested to addresses these issues in MR: The monitoring report, version 1, section 5.1 mention the 'Baseline Emissions', however 'Emission Factor Caluation' section is missing, which is not in line with PD, PP is requested to please refer the page 57 of the PD.				
Project Proponent response				Date : 09/12/2022
Section has been revised.				
Documentation provided by project Proponent				
VVB assessment				Date: 06/01/2023
VVB has confirmed that section has been revised by the PP and found inline with the PD. Hence, CL#02 is closed.				

CL ID	03	Section no.	ER	Date : 18/11/2022
Description of CL				
PP is requested to addresses these issues in ER: In accordance with ER – Tab (Baseline Emissions), Cells - D4(BE _{EC,y}), E4(BE,y) values are missing in the MR. The PP is requested to kindly justify it.				
Project Proponent response				Date : 20/12/2022
ER Calculation document is revised. Calculations and values are added to the MR accordingly.				
Documentation provided by project Proponent				
VVB assessment				Date: 06/01/2023
VVB has confirmed that PP has been revised the ER sheet and Now, the calculations and values are added and found consistent. Hence, CL#03 is closed.				

CL ID	04	Section no.	4.1&4.2	Date : 30/01/2023
Description of CL				
1. In accordance with PDD the description of the parameter SPECflare is missing in section 4.1 of the MR. PP is requested to clarify. 2. Data/Parameter: k: Inconsistent with tool 4(Data/ parameter table 7). PP is requested to kindly update				
Project Proponent response				Date : 02/02/2023
1. SPECflare is in section 4.1 of the MR. 2. Revised.				
Documentation provided by project Proponent				
VVB assessment				Date: 06/02/2023

1. VVB has confirmed that the parameter "SPECflare" now added in revised MR and found consistent with the PDD.
 2. VVB has confirmed that the parameter K is now consistent with the tool.
- Hence, CL#04 is closed.

CL ID	05	Section no.	4.1	Date: 01/02/2023
Description of CL				
Under Section-4.1 "Data and Parameters" The serial no. of main meter "SL7000" is 84260488. However, During On-site visit by the local Expert, the Serial no. of main meter "SL7000" is 24700513. PP shall address the inconsistency.				
Project Proponent response				Date: 02/02/2023
24700513 is the installation number of the main meter. 84260488 is the serial number of the main meter.				
Documentation provided by project Proponent				
VVB assessment				Date: 06/02/2023
In accordance with the PP's response VVB is now clear that the serial no. of the main meter is 84260488 and found consistent with the calibration certificate. Hence, CL#05 is closed.				

CL ID	06	Section no.	3.1	Date : 05/06/2023
Description of CL				
1. Under Section 3.1 "Implementation Status", Figure 4&5 "Flow process chart" indicates that there are two flares installed at site for both the booster units. However, in Table 4 "Machine and equipments" only 1 flare unit has been mentioned. PP shall clarify the number and the exact placement location of the flaring equipment. Additionally no flaring has been reported, PP shall justify zero flaring in the current monitoring period. The metering points are also required to be clarified in the flow diagram for all monitored parameters. 2. the information on the implementation of the gas engines is inconsistent in different sections; a total of 22 gas engines have been mentioned in the PD sections however the MR section indicte phase wise implementation. Request to please clarify.				
Project Proponent response				Date : 06/06/2023

1. Process flow charts (PFDs) are revised. There is only one flare unit on the site. It's part of booster-1 unit and connection to booster-2 unit gas line (by-pass) also exists. This situation is indicated in the PFDs. Also LFG flow is highlighted with blue for better visuals. The metering points gas analyzers and electricity meters's display is found sufficient since there is only 2 gas analyzers (one for each booster) and electricity meters belongs to whole plant. Short description is added for Pressure (P), Temperature (T) and flow rate (Q) metering points where LFG is conditioned to be destroyed either in either gas engines or flares.

Electricity revenue generation is the only income source of plant operator (IZMIR Novtek Enerji Elektrik Üretim A.Ş.) therefore special emphasis is given to maximize electricity generation. Flares are installed and operational on-sites but planned to be used under extreme conditions. There are diesel generators that powers gas engines when there is power outages on site to keep operation, however these situations doesn't last more than a couple of hours. Technicians with remote gas analyzers check methane content and LFG pressure in lots from sampling points daily. This way methane content and clogging in gas collection system are monitored. Bypass lines are installed in clogged regions without disturbing the covered layers. These practice prevents gas pressure spikes.

Installed capacity is planned sufficient enough to compensate increased LFG flow for short periods of time.

There is an gas balloon (for LFG storage) on-site with a volume of 10,000 m³. Generated LFG is sent to gas balloon and vacuumed to gas engines with booster. Gas balloon acts as equalizer and can hold an hour or so worth of generated LFG.

2. Table 3 at page 18 displays commissioning dates of gas engines. These information is included in second paragraph of section 3.1 (page 13).

Documentation provided by project Proponent

VVB assessment

Date: 08/06/2023

1. Verification team found that the process flow chart are revised. PP has explained there is only one flare and also description about Pressure (P), Temperature (T) and flow rate (Q) metering points where LFG is conditioned to be destroyed either in either gas engines or flares has been added. Also The explanation given by PP is found satisfactory.
2. PP has added table in page 18 to display the commissioning dates of the gas engines as table 3. Verification team found that the description and the information included to be satisfactory.

Both the comments have been addressed satisfactorily.

Hence CL#06 is closed.

CL ID	07	Section no.	ER sheet	Date : 05/06/2023
Description of CL				
The composition in percentage of all the reported four gases (CH4, O2 CO2 & H2S: Cell C, D, E, F in the Booster) sums up to be more than 100% each. PP shall clarify how the addition can be more than 100%				
Project Proponent response				Date : 06/06/2023
CH4, CO2 and O2 is measured by volumetric fraction and displated as percentages (%). H2S gas is in range of ppm (1% = 0.0001 ppm). Gas analyzer measurement unit is displayed in ER sheet version 8.				
Documentation provided by project Proponent				
VVB assessment				Date: 08/06/2023
In accordance to PP response, it is now clear that all the gases are measured in volumetric fractions and the values are in having the unit displayed in percentages. The comment looks satisfactorily addressed Hence CL#07 is closed				

Table 2.CAR from this verification

CAR ID	01	Section no.	MR	Date : 18/11/2022
Description of CAR				
PP is requested to addresses these issues in MR: 1. The monitoring report, version 1, section 3.1 mentions the 'Implementation Status of theProject Activity', however, the section is not filled by the PP as per the template guidelines, the PP is requested to provide a clarification for the same. 2. The monitoring report, version 1, section 4.1 mentions the 'Data and Parameters Available at Validation', however, the parmataers 'p CH4, n' & 'SPECflare' tables are missing, which are not in line with the PD, PP is requested to Pls refer page 81 (PD). 3. The monitoring report, version 1, section 4.2, mentions the 'Data and ParametersMonitored', however the tables are not described, the PP is requested to justify. 4. The monitoring report, version 1, section 1.8 mention the 'Title and Reference of Methodology', however 'TOOL-06' is missing, which is not in line with PD, PP is requested to please refer page 26 (PD). 5. The monitoring report, version 1, section 5, mention the 'QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS', the PP is requested, please put the value (s) in the equation, please refers, sub section 5.1 – Baseline Emissions, sub section 5.2 – Project Emissions, sub section 5.3 – Leakage and sub section 5.4 – Net GHG Emission Reductions and Removals. 6. The PP is requested to mention years as 2019, 2020, 2021 instead of 1, 2, 3 throughoutER – Calculation sheet and in MR. 7. The monitoring report, version 1, section 5.2, mention the "Project Emissions" - equation '$PE_y = PEEC_{,y} + PEFC_{,y} + PEDT_{,y} + PESp_{,y} + PEFC_{,j,y} + PEflare_{,y}$' is missing, the PP is requested to kindly mention it. 8. The PP is requested to please mention page number (s) in the monitoring report.				
Project Proponent response				Date : 20/12/2022
1. Section is revised. 2. Tables are added. 3. Tables are added. 4. Reference to the above mentioned tool is added. 5. ER Calculation is revised. Values are added. 6. Years are revised as requested. 7. Missing parts are added. 8. Page numbers are revised.				
Documentation provided by project Proponent				
VVB assessment				Date: 06/01/2023

VVB has assessed the latest updated MR,ER and observed the following:

1. The monitoring report, version 03, section 3.1 mention the 'Implementation Status of the Project Activity' is now consistent with the template.
2. The monitoring report, version 03, section 4.1 mention the 'Data and Parameters Available at Validation', The parameters 'p CH₄, n' & 'SPECflare' tables are added and now consistent with the PDD.
3. The monitoring report, version 03, section 4.2, 'Data and Parameters Monitored', PP has added the tables.
4. PP is now added TOOL06 in section 1.8 of the latest MR(Version-03) and found consistent.
5. PP has update the MR and ER and now values are added and found consistent.
6. PP has update the ER sheet.
7. PP has update the equation ' $PE_y = PEEC_{,y} + PEFC_{,y} + PEDT_{,y} + PESp_{,y} + PEFC_{,j,y} + PEflare_{,y}$ ' in section-5.2 in the revised MR (Version-03).
8. Page no. are added in the revised version of MR (Version-4)

Hence, CAR#01 is closed.

CAR ID	02	Section no.	ER	Date : 18/11/2022
Description of CAR				
1. The 'Waste Type J' (table) in cell C3, tab 'Summary', the values are not in line with, Data / Parameter 'DOCj' values, refer Monitoring report, DOCj table, section 4.1. 2. Cells J2, K2, L2, and M2 for these cells' total value (s) are not mentioned in the tab "Summary" The PP is requested to mention it. 3. In accordance with ER – Tab (Project Emissions), Cell – (F4), the PP is requested to rectify the inconsistent dimension value. 4. In the tab 'BE EC,y', the cells C4, D4 and C5, the cells are inconsistency with MR, please refer MR – section 4.1, (EFCO₂,grid, y and TDL_j,y parameters table) 5. The value (s) are mentioned [16,757.7 - cell B13], [1,56,915.8 - C13] and [2,13,292.4 - D13], tab 'BE EC,y', whereas this is mentioned as 933 for 2019, 8,572.4 for 2020 and 12,175 for 2021 in the MR (Section: 5.4 – Net GHG Emission Reductions and Removals). 6. The value (s) are mentioned [10,633.3 - cell B14], [99,568.1 – cell C14] and [1,35,340.8 – cell D14], tab 'BE EC,y', whereas this mentioned as 592 for 2019, 5,441.6 for 2020 and 7,727.2 for 2021 in the MR (Section: 5.4 – Net GHG Emission Reductions and Removals).				
Project Proponent response				Date : 20/12/2022
1. Waste Type J and DOCj are different parameters. DOCj values are found to be consistent. Please note that those are for ex-ante estimations and parameters that are not monitored. ER has been revised as ex-post calculation. 2. Revised as requested. ER has been revised as ex-post calculation. 3. Fuel has been revised as Fuel Consumption per Hour. ER has been revised as ex-post calculation. 4. Revised as requested. ER has been revised as ex-post calculation. 5. Inconsistency is corrected. 6. Inconsistency is corrected. Please note that ER Calculation is revised. So some of the CARs may be related to the parts that will be changed later on.				
Documentation provided by project Proponent				
VVB assessment				Date: 06/01/2023

VVB has assessed the latest updated MR,ER and observed the following:

1. The 'Waste Type J' Parameter 'DOCj' values are now consistent with updated ER sheet.
2. PP has revised ex-post calculation and found consistent and satisfactory.
3. PP has been revised the ER sheet and now, dimension value are consistent.
4. PP has been revised the ER sheet and now, The cells C4, D4 and C5 are consistent.
5. PP has been updated the Section: 5.4 – “Net GHG Emission Reductions and Removals” of the MR and now consistent with the ER sheet.
6. PP has been updated the Section: 5.4 – “Net GHG Emission Reductions and Removals” of the MR and now consistent with the ER sheet.

Hence, CAR#02 is closed.

CAR ID	03	Section no.	MR	Date : 30/01/2023
Description of CAR				
1. In section 1.10 of MR “Other Forms Of Credit and Supply Chain(Scope-3) Emissions”, PP is requested to also define the supply chain (Scope-3) Emissions under this section. 2. Under section 4.1 “Data and Parameters”, Parameter” W_{total}”. PP is requested to provide the link for the historical waste data. 3. Under Section 4.2 “Data and Parameters Monitored” $EG_{PJ,y}$” Amount of Electricity Generated using LFG by the Project Activity in the year for 2019,20,21,22 are found inconsistent with the EPIAS record. PP shall address the inconsistency.				
Project Proponent response				Date : 02/02/2023
1. Revised. 2. Historical waste data link is added. 3. Revised.				
Documentation provided by project Proponent				
VVB assessment				Date: 06/02/2023
1. PP has revised the MR and define the supply chain emission under section 1.10 and found consistent. 2. Historical waste data link is given in PDD. 3. PP has revised the MR and update the values and now, values are consistent with the EPIAS record and found consistent. Hence, CAR#03 is closed				

APPENDIX III: ABBREVIATIONS

Abbreviations	Full texts
BEF	Baseline Emission Factor
BM	Build Margin
CAR	Corrective Action Request
CL	Clarification Request
CMS	Central Monitoring System
CMP	Conference of Parties Serving as Meeting of Parties

CO ₂	Carbon dioxide
EB	Executive Board
FAR	Forward Action Request
GHG	Green House Gas
ISO	International Standards Organization
JMR	Joint Meter Reading
Kw	Kilowatt
kWh	Kilowatt hour
MFR	Multi-Function Relay
MR	Monitoring Report
MWh	Megawatt-hour
PD	Project Description
PLF	Plant Load Factor
PP	Project Proponent
QA/QC	Quality Assurance and Quality Control
TEIAS	Turkish Electricity Transmission Corporation
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCSA	Voluntary Carbon Standard Association
VCS PD	VCS Project Description
VCUs	Voluntary Carbon Units

APPENDIX IV: COMPETENCY STATEMENTS

Competence Statement	
Name	Shreya Garg
Country	India
Education	M.Sc. (Climate Science & Policy), TERI University
Experience	9 Years +
Field	Climate Change
Approved Roles	
Team Leader	YES
Validator	YES
Verifier	YES
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., AMS.III.BL, ACM0002, ACM0012
Local expert	YES (India)
Financial Expert	NO
Technical Reviewer	YES
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)

Reviewed by	Shifali Guleria	Date	21/12/2022
Approved by	Deepika Mahala	Date	21/12/2022

Competence Statement			
Name	Kubra Agriman		
Education	BS Environmental Engineering		
Experience	2 years		
Field	Environmental Engineering		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	Yes (Turkey)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee	Yes		
Reviewed by	Shifali Guleria, Quality Manager	Date	27/12/2022
Approved by	Deepika Mahala, Technical Manager	Date	27/12/2022

Competence Statement			
Name	Ashok Gautam		
Country	India		
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
Experience	16 Years +		
Field	Energy, Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-I.A., AMS-I.C., AMS-I.E, AMS-II.D., AMS-II.G., AMS-III.E., AMS-III.H., AMS-III.Q, AMS-III.Z., AMS-III.AV., AMS III.AR, AM0029, AM0025, AM0056, ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0017, ACM0009, AM0034, AMS.I.B, ACM0016, AMS-III.BL, AMS-II.L, AMS-I.I., AMS-III.A.O., ACM0010		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Shifali Guleria	Date	14/12/2022

Approved by	Deepika Mahala	Date	14/12/2022
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Competence Statement			
Name	Ashish Yadav		
Education	M.Sc Environmental Sciences B.Sc Biotechnology		
Experience	1 Year		
Field	Wastewater treatment		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee	Yes		
Reviewed by	Shifali Guleria (Quality Manager)	Date	20/09/2022
Approved by	Deepika Mahala (Technical Manager)	Date	20/09/2022

Competence Statement			
Name	Anjali Chaudhary		
Education	Bachelor of technology in Civil Engineering		
Experience	8 months		
Field	Civil Engineering		
Approved Roles			
Team Leader	Yes (VM)		
Validator	Yes		
Verifier	Yes		
Methodology Expert	No		
Local expert	Yes (India)		
Financial Expert	No		
Technical Reviewer	No		
TA Expert (X.X)	No		
Reviewed by	Shifali Guleria (Quality Manager)	Date	11/01/2023

Approved by	Deepika Mahala (Technical Manager)	Date	11/01/2023
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Competence Statement			
Name	Kaviraj Singh		
Education	Ph.D. (Environmental Engineering), IIT Delhi Masters (Energy & Environmental), DAVV Indore		
Experience	15 Years +		
Field	Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-II.D., ACM0006, AMS-I.A., AMS-I.C., AMS-II.B., AMS-III.H, ACM0002, ACM0001, AM0080, ACM0018, AM0056, AM0073 VM0042, AMS-III.G, AMS-III.AF., VM0032, VM0018, ACM0010, ACM0022, AMS-III.D, AMS-III.F and AMS-III.A.Q		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert (X.X)	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1, TA 13.2)		
Reviewed by	Shifali Guleria (Quality Manager)	Date	02/02/2023
Approved by	Deepika Mahala (Technical Manager)	Date	02/02/2023