Validation report form for post-registration changes for CDM project activities **(Version 03.0)**	
Complete this form in accordance with the instructions attached at the end of this form.	
BASIC INFORMATION	
Title and UNFCCC reference number of the project activity	Landfill Gas Recovery and Flaring Project in El Verde Landfill Leon UNFCCC ID: 3378
Process track	☐ Prior approval ☒ Issuance ☐ Renewal of crediting period
Version number of the validation report	Version 1.1
Completion date of the validation report	221/~~1042~~/2020~~19~~
Type(s) of PRCs	☒ Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents[1] ☐ Corrections ☐ Changes to the start date of the crediting period ☐ Inclusion of a monitoring plan ☐ Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents ☐ Changes to the project design ☐ Changes specific to afforestation and reforestation project activities
Version number of PDD to which this report applies	Version 5.0
Project participants	Promotora Ambiental S.A.B. de C.V. First Climate AG
Host Party	Mexico
Applied methodologies and standardized baselines	ACM0001: Flaring or use of landfill gas, version 18
Mandatory sectoral scopes	Scope 13
Conditional sectoral scopes, if applicable	Scope 1
Name and UNFCCC reference number of	TÜV NORD CERT GmbH

[1] Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

Formatiert: Rechtschreibung und Grammatik prüfen
Formatiert: Englisch (Vereinigtes Königreich)
Formatiert: Schriftart: 10 Pt.
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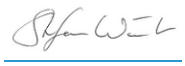
the DOE	
Name, position and signature of the approver of the validation report	 Stefan Winter Final Approver

SECTION A. Executive summary

As this assessment was carried out as part of the verification number 6th MP (1st MP of the 2nd CP) of the project activity please refer to section A of the verification report.

For a detailed project description please refer to the registered to the latest verification report (to which this report is attached).

SECTION B. Validation team, technical reviewer and approver

On the basis of a competence analysis and individual availabilities an assessment team, consistent of one team leader. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the following table below.

B.1. Validation team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Validation findings
1.	Team Leader/Technical Expert	EI	Oliver	Quireza	TN México	x	x	x	x

B.2. Technical reviewer and approver of the validation report on PRCs

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Observer reviewer	EI	Lubanga	David	-
2	Technical reviewer/Approver[2]	IR	Winter	Stefan	TÜV NORD CERT
3	Approver[3]	IR	Rami	Kunal	TÜV NORD CERT

SECTION C. Means of validation

C.1. Desk/document review

>>

The *assessment of post registration changes* consisted of the following steps:

- Appointment of team members and technical reviewers
- A desk review of the registered and revised PDD/PDD/ submitted by the client and additional supporting documents
- On-Site assessment (if required)

[2] Final approver in response to the incomplete issue raised
[3] Initial final approver for first request for issuance submission

- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Resolution of corrective actions (CARs / CLs) (if any)
- Final reporting
- Technical review
- Final approval.

In this case all activities were carried out as part of the verification 6th MP (1st MP of the 2nd CP) of this project activity.
The registered PDD and supporting background documents related to the post registration changes were reviewed.
As far as required the assessment team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

A list of all documents reviewed or referenced during this validation is presented in ~~Fehler! Verweisquelle konnte nicht gefunden werden.~~ Appendix 3.

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C.2. On-site inspection

Duration of on-site inspection: 08/04/2019 to 10/04/2019				
No	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Kick off meeting	Landfill site	08/04/2019	Oliver Quireza
2.	Checking relevant site points	Landfill site	08/04/2019	Oliver Quireza
3.	Evidence assessment	Landfill site	09/04/2019	Oliver Quireza
4.	Preparation of the DVR	Landfill site	09/04/2019	Oliver Quireza
6.	Findings summary to the client	Landfill site	10/04/2019	Oliver Quireza
7.	Working day auditor-client to close findings	Landfill site	10/04/2019	Oliver Quireza
8.	Closing meeting	Landfill site	10/04/2019	Oliver Quireza

C.3. Interviews

No.	**Interviewee**			**Date**	**Subject**	**Team member**
	Last name	**First name**	**Affiliation**			
1.	Hernandez	Reynaldo	PASA	08-10/04/2019	LFG and Energy Coordinator	Oliver Quireza
2.	Lopez	Felipe de Jesus	PASA	09/04/2019	Landfill Manager	Oliver Quireza
3.	Palacio	Gerardo	PASA	08-10/04/2019	Biogas Technician	Oliver Quireza
4.	Cuadrat	Sergi	Clima Loop	08-10/04/2019	CDM Consultant	Oliver Quireza

C.4. Sampling approach

D.4.1 Sampling during monitoring

☒	No sampling approach has been used by the PP to determine the monitored parameters
☐	A sampling approach has been taken for the following monitored parameter(s):

Parameter	Sampling approach [1)]	Sampling Type [2)]	Population	Sample Size

[1] Sampling Approaches:
SiRS: Simple Random Sampling
StRS: Stratified Random Sampling
SS: Systematic Sampling
CS: Cluster Sampling
MSS: Multi-stage Sampling
AS: Acceptance Sampling

[2] Sampling Types:
PS: Parameter Sampling

D.4.2 Sampling approaches during verification and/or validation of this PRC

☒	No sampling approach has been used by the VT to verify the monitored parameters				
☐	A sampling approach has been applied by the VT for the following monitored parameter(s):				
	Parameter	Sampling approach [1]	Sampling Type [2]	Population	Sample Size

[1] Sampling Approaches:
SiRS: Simple Random Sampling
StRS: Stratified Random Sampling
SS: Systematic Sampling
CS: Cluster Sampling
MSS: Multi-stage Sampling

[2] Sampling Types:
AS: Acceptance Sampling
PS: Parameter Sampling
COM: Full data check at higher data aggregation levels and sampling at original data levels

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	-	-	-
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents	-	21	-
Corrections	-	-	-
Changes to the start date of the crediting period	-	-	-
Inclusion of a monitoring plan	-	-	-
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents	-	-	-
Changes to the project design	-	-	-
Changes specific to afforestation and reforestation project activities	-	-	-
Others (please specify)	-	-	-
Total	-	21	-

SECTION D. Validation findings

D.1. Compliance with PDD form

Means of validation	No revised PDD is required as the PRC is a Temporary deviation from the registered monitoring plan
Findings	-

Conclusion	Ok.

D.2. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

Means of validation				
	Type of change(s):	☒	*Temporary Deviation from Monitoring Plan*	
		☐	*Temporary Deviation from Monitoring Methodology*	
	Description of post registration change			
	Start Date: Please provide the start date of the change	27/10/2017	**End Date:** Please provide the end date of the change, if applicable	31/12/2018
	Description: Please give a detailed description of the change(s)	During the first crediting period, the CDM-PDD did not have any reference to the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" to correct the flow to dry basis when the temperature >60ºC, and the PP provided an alternative method in line with thermodynamics principles and such situation was not updated in renewal of the crediting period. 1) For this 1st monitoring period of the 2nd Crediting period, since the monitoring parameter "volumetric fraction of H2O in time interval t on a dry basis (vH2O,t,db)" was not estimated exactly as per provisions defined under registered PDD in the first submission of this monitoring period, for the second submission of this monitoring period the PP has decided to conservatively disregard all flows values when the temperature was equal or higher~~greater~~ than 60ºC, which accounts for approximately 10% of the landfill gas. 2) The flare efficiency ($\eta_{flare,m}$) is determined/calculated every two minutes instead of each minute as required by the monitoring plan and as per option B.2 of the tool "Project emissions from flaring" (Version 02.0.0)	
	Assessment of post registration change – Temporary deviations from MP or MM			
	Accuracy: Please give a detailed assessment whether the deviation is likely to lead to a reduction in the accuracy of the ER calculation.	1) The decision to disregard all flows values T => 60ºC (wet basis) is accurate and in line with the registered PDD choices and also the re-calculated ER value is conservative; this is verified in columns D and E of spreadsheet /error/ in xls file Raw_Data_El_Verde_6MP_v7~~5~~. ~~2)~~ The parameter VLFG,sent_flare,y,db (m³ dry gas/h) is measured continuously by a flow meter at normal pressure and temperature and registered electronically by the system Landtec. The meter provided the normalized flow values adjusted by P and T so no further adjust is required. This is in line with the approved clarification "AM_CLA_0023"[4]. Tt is monitored, in line with the registered PDD, to determine when Tt exceeds 60°C. - in case of Tt < 60ºC (Option A) The monitoring of parameter VLFG,sent_flare,y,db is in line with the registered monitoring plan and the applied	

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[4] https://cdm.unfccc.int/methodologies/PAmethodologies/clarifications/81628, approved on 13/04/2006

		methodology and tools. - in case of Tt > 60ºC (Option B) As stated in the previous point, PP decided to not to consider the values of parameter VLFG,sent_flare,y,wb (m³ wet gas/h) in the ER calculation. This decision is in line with the registered PDD. The calculation is conservative, which was verified in columns D and E of spreadsheet /error/ in xls file Raw_Data_El_Verde_6MP_v75. 2) The continuous monitoring of the flare efficiency ($\eta_{flare,m}$) requires a robust and sophisticated monitoring system, the fact that the PP decided to invest in such system instead of taking a default efficiency value (90%) for enclosed flares, shows the interest of the PP to implement an accurate monitoring system. In the region Latin America, only a couple of CDM projects have a similar continuous monitoring system, as most of the projects opt for an equipment only enough to apply a default efficiency. From the estimated efficiency values through out the whole MP it can be observed that the values vary between 90.1% and 98.6% being the year average 96.3%, which is a common value for this kind of enclose, where the manufacturer John Zink states an efficiency of 98%. Around 3,542 times per month the efficiency is calculated. Considering the big amount of data and robust monitoring plan, personnel and resources invested in the monitoring system, and the obtained efficiency values between the typical operation rank, it can be concluded that the calculation every two minutes instead of each minute doesn't affect the accuracy of the ER.
Conservative-ness: Please give a detailed assessment whether conservative assumptions or discount factors have been applied to ensure that ER will not be overestimated.		~~1)~~ As a result of the temporary deviation and the decision of the PP to disregard all flows values when the temperature was greater than 60ºC, the ER result lesser with approximately 10% of the landfill gas. 1) In line with §282 VVS, PP applied the most conservative values approach referred to in the "CDM project standard for project activities" for the non-conforming monitoring period. In detail, PP applied zero for the baseline emissions for the entire non-conforming period. PP followed therewith the relevant §231 (b) of the CDM project standard for project activities. Therefore, no approval by the Board is required. 2. The determination/calculation of the flare efficiency ($\eta_{flare,m}$) every two minutes instead of each minute as required by the monitoring plan and as per option B.2 of the tool "Project emissions from flaring" (Version 02.0.0) doesn't affect the conservativeness of the ER calculation. Except by the determination/calculation of the flare

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		efficiency ($\eta_{flare,m}$) every two minutes instead of each minute as required by the monitoring plan and the tool "Project emissions from flaring" (Version 02.0.0), the other components of the monitoring plan and the all ER calculation spreadsheets were performed in line with the provisions of the PDD, applicable methodology ACM0001: Flaring or use of landfill gas, version 18 and applicable tools. In the cases where calibration gaps in the meters of the monitoring system took place, the proper adjustment with the maximum permissible error of the meters. The ER calculation is considered conservative and in line with §365-371 of the VVS version 2.
	Appendix 1 PS: Check if the changes fall under one of the scenarios of appendix 1 of the PS.	The PRC does not require prior approval as per Appendix 1 of the PS
Findings	CAR 01, CAR 02	
Conclusion	Based on the above the temporary deviation(s) from the registered monitoring plan, applied monitoring methodology and/or applied standardized baseline are in accordance with applicable validation requirements related to the temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline in the VVS.	

Revised PDD		
Rev. of PDD: Check whether the changes have been fully addressed in a revised PDD.	☐	The changes have correctly been reflected in the revised PDD.
	☒	A revision of the PDD is not required (in case of temp. changes).
	☐	The revised PDD has been forwarded in (i) track-change and (ii) clean version.
Prior Approval		
Prior approval: Assess whether the change requires prior approval of the board	☐	The post registration change requires prior approval
	☒	The post registration change does not require prior approval

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D.3. Corrections

Means of validation	Not applicable
Findings	
Conclusion	

D.4. Changes to the start date of the crediting period

Means of validation	Not applicable
Findings	
Conclusion	

D.5. Inclusion of a monitoring plan

Means of validation	Not applicable as the monitoring plan is already included.
Findings	
Conclusion	

D.6. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

Means of validation	Not applicable
Findings	
Conclusion	

D.7. Changes to the project design

Means of validation	Not applicable
Findings	
Conclusion	

D.8. Changes specific to afforestation and reforestation project activities

Means of validation	Not applicable as this is no A/R project
Findings	
Conclusion	

SECTION E. Internal quality control

Before submission of the final assessment report a technical review is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.
As a result of the technical review process the assessment opinion as prepared by the validation team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

SECTION F. Validation opinion

The below listed changes have occurred after the registration of the project / PoA.

Type of Change occured	*Total No. of changes*	*No. of changes which require prior approval*
☒ Temporary deviations from the MP	1	0
☐ Temporary deviations from the MM	-	-
☐ Corrections that do not affect the project	-	-
☐ Change to the start date of the crediting p.	-	-
☐ Permanent changes from the MP	-	-
☐ Permanent changes from the MM	-	-
☐ Design changes to the project activity / PoA	-	-
☐ Changes specific to AR projects	-	-

None of the changes requires prior approval of the Board.

Queretao, 2120/0412/202019

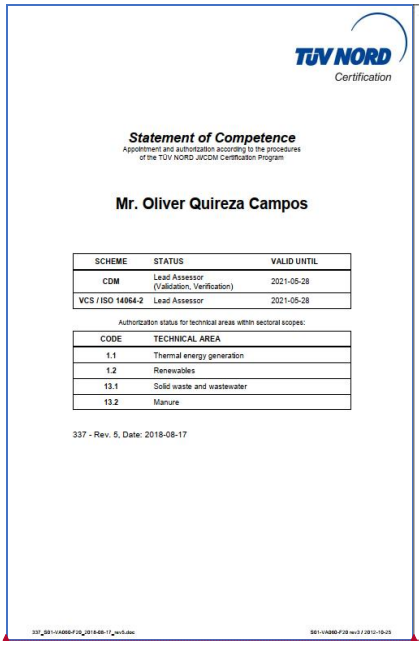
Formatiert: Rechtschreibung und Grammatik prüfen

Oliver Quireza
TÜV NORD JI/CDM CP
Assessment Team Leader

Appendix 1. Abbreviations

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CFE	Federal Commission of Electricity
CO_2	Carbon dioxide
CO_{2eq}	Carbon dioxide equivalent
CL	Clarification Request
DVerR	Draft Verification Report
ER	Emission Reduction
ERPA	Emission Reduction Purchase Agreement
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IM	Interview Memo
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
PDD	Project Design Document
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
VT	Verification Team
XLS	Emission Reduction Calculation Spread Sheet

Appendix 2. Competence of team members and technical reviewers



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

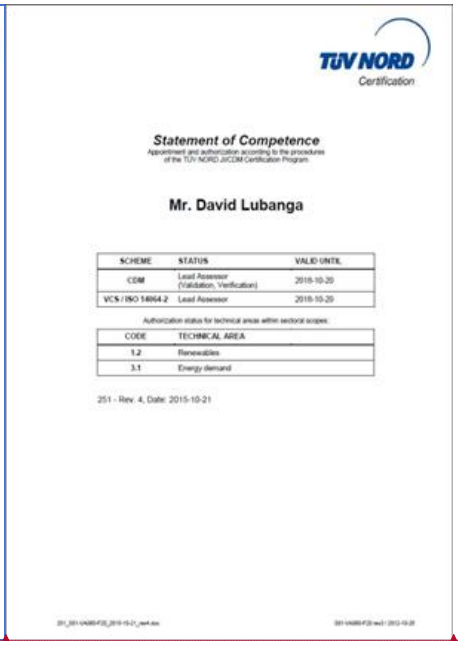
Mr. Oliver Quireza Campos

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2021-05-28
VCS / ISO 14064-2	Lead Assessor	2021-05-28

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
13.1	Solid waste and wastewater
13.2	Manure

337 - Rev. 5, Date: 2018-08-17



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

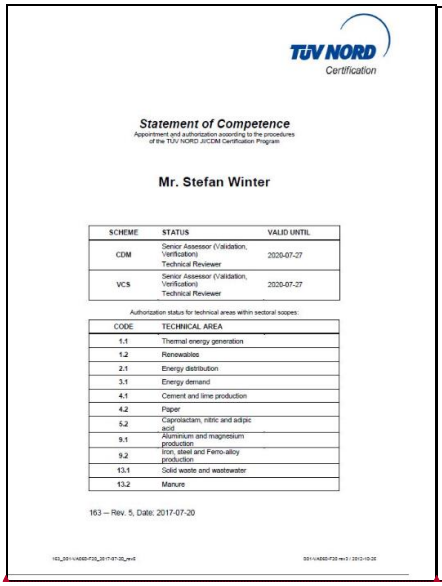
Mr. David Lubanga

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2018-10-20
VCS / ISO 14064-2	Lead Assessor	2018-10-20

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy demand

251 - Rev. 4, Date: 2015-10-21



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

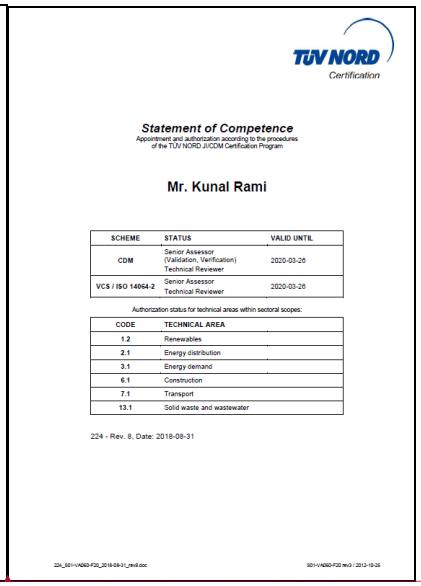
Mr. Stefan Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2020-07-27
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2020-07-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
4.1	Cement and lime production
4.2	Paper
5.2	Caprolactam, nitric and adipic acid
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
13.1	Solid waste and wastewater
13.2	Manure

163 – Rev. 5, Date: 2017-07-20



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Kunal Rami

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2020-03-26
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2020-03-26

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
6.1	Construction
7.1	Transport
13.1	Solid waste and wastewater

224 - Rev. 8, Date: 2018-08-31

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Formatiert: Englisch (Vereinigtes Königreich), Rechtschreibung und Grammatik prüfen

Appendix 3. Documents reviewed or referenced

No.	Author	Reference	Title	References to the document	Provider
1.	UNFCCC	**/ACM0001/**	Flaring or use of landfill gas, version 18	https://cdm.unfccc.int/methodologies/DB/Y88077XT5O83TZ2PYEZ36LFIAMAODR	Other
2.	DOE	**/CPM/**	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)		Other
3.	IPCC	**/IPCC/**	2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	www.ipcc-nggip.iges.or.jp	Other
4.	UNFCCC	**/KP/**	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
5.	UNFCCC	**/MA/**	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
6.	UNFCCC	**/TOOL/**	Methodological Tools as per section E.5	https://cdm.unfccc.int/methodologies/index.html	Other
7.	UNFCCC	**/MRT/**	Monitoring Report Form (CDM-MR-FORM), Version 6	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
8.	UNFCCC	**/PDD/**	Project Design Document for CDM project: "Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León" version 13, dated 2013-07-01 Project Design Document for CDM project: "Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León" version 5.0, dated 04/09/2018	https://cdm.unfccc.int/filestorage/_/t/21SWKOQDLRH4J679UBT85VCG0PYF3I.pdf/CDM-PDD-3378-23-09.pdf?t=T1R8b2Q1NG9lfDAlTnqu7Ld_ZM4qgIDhwdYg	Other
9.	UNFCCC	**/PS/**	CDM Project Standard (Version 2.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
10.	PP	**/VAL/**	Validation Report for CDM project "Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León" version 4, dated 2010-10-26. Validation report for renewal of crediting period for CDM activity: Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León, version, from 04/09/2018, by Applus+ Certification.	https://cdm.unfccc.int/filestorage/X/D/K/XDK3CIJ9GAYQ0O8FS4ZLT76RE1N5WM/Revised%20Validation%20Report%20%28clean%29.pdf?t=bjJ8b2Q1a3ZvfDCjfGBF7vDqGz2Uafnd7YFL	Other
11.	PP / DOE	**/VER/**	Documents of actual and previous verifications (Monitoring report, verification report, ER calculation sheet)		Other
12.	UNFCCC	**/VVS/**	CDM Validation and Verification	http://cdm.unfccc.i	Other

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No.	Author	Reference	Title	References to the document	Provider
			Standard (Version 2.0)	nt/Reference/Standards/index.html	
13.	UNFCCC	**/GOT/**	Glossary "CDM terms" (version 10.0)	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20190917101421346-Glos_CDM.pdf/Glos_CDM.pdf?t=Tkl8cTR1d2R4fDAIJJZCCx3ZrrtzRP6kGRrw	Other
14.	SEMARNAT	**/NOM/**	Mexican Official Norm NOM-083-SEMARNAT-2003. Specifications of Environmental Protection for site selection, design, construction, operation, monitoring, closure and complementary works of a final disposal site for municipal solid waste and special handling – "*Especificaciones de Protección Ambiental para la selección del sitio, diseño, construcción, operación, monitoreo, clausura y obras complementarias de un sitio de disposición final de residuos sólidos urbanos y de manejo especial".*	N/A	PP
15.	Guanajuato State (Ecology)	**/EIA/**	➢ Resolution EIA, by Ecology Institute, from 23/11/2000 ➢ Resolution EIA, by Ecology Institute, from 07/07/2017 for the power generation phase	N/A	PP
16.	Gov	**/LIC/**	Environmental Resolution num. PAYDS-DS-902-2007 given by the Leon Municupality on 2007-11-14 which states that the Project activity does not required an envirnmental license.	N/A	PP
17.	EIPS	**/INS/**	Compliance dictameination as per NOM-083-SEMARNAT-2003, from 29/05/2018	N/A	PP
18.	Several	**/TECH/**	1. LFG Collectyion System description by Promotora Ambiental (without date) 2. Lay out of LFG collection system num. 06, July 2011 by PASA. 3. LFG Flare System description by Promotora Ambiental (without date) 4. Lay out of LFG flare system (whithout date) 5. Operation and Maintenance Manual for an Enclosed ZTOF Biogas Flare System by John Zink. Sales Order 9084234 6. Design Specifications by John Zink LFG Flare System, 08-09-2011 7. Techncial specification – FAU – by Landtec 8. Techncial specification – FEA – by	N/A	PP

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No.	Author	Reference	Title	References to the document	Provider
			Landtec 9. Techncial specification adjustable Liquid-Level Gauge by Rochester Gauges, INC. 10. Integral Thermal Mass Probe Flow Meter specifications model 62-9/9500 by Thermal Instruments Company, Inc. 11. Thermocouples specification sheet by John Zink, project 9084234 Manufacturer statements /recommendation for calibration frequency: 1. Letter from Measurement Resources authorized factory representative for Thermal Instrument dated on 19-06-20111 recommending 18 months calibration frequency. 2. Letters from Landtec dated on 28-10-2013 and 15-06-2011 recommending 6 months calibration frequency for FAUs & FEA. 3. Letter from John Zink (without date) regarding the recommended calibration of thermocouples with frequency every 18 months. 4. Letter from Soni Gas (gas distributor) dated on 08-09-2011 stating that no calibration is required for Liquid-Level Gauge. 5. Data sheet E650 S4e and E330 FOCUS AX Polyphase meters.		
19.	Several	**/CC/**	Calibration Certificates information is described in Appendix 6	N/A	PP
20.	PP	**/LOG/**	Operational logbooks 2017, 2018 ➢ Daily operation reports ➢ Weekly maintenance report	N/A	PP
21.	PP	**/MR/**	Monitoring Report 6th "Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León", - Version 01, 08/03/2019 - Version 02, 18/04/2019 - Version 03, 30/05/2019 - Version 04, 11/06/2019 - Version 05, 30/09/2019 - Version 06, 17/12/2019 -Version 07, 20/04/2020	N/A	PP
22.	PP	**/XLS/**	-Emission reduction calculation spreadsheet (Monthly): 0X. ER Spreadsheet_6thMP covering the MP (15 Months), versions: - ver. 1, 08/03/2019 - ver. 2, 18/04/2019 - ver. 3, 30/05/2019 - ver. 4, 29/09/2019 - ver. 5, 30/09/2019 - ver. 7, 20/04/2020	N/A	PP

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No.	Author	Reference	Title	References to the document	Provider
			-ER summary_6thMP_versions v1, v2, v3, v4, v7 ~~and v5~~		
23.	-Landtec -CFE -LP Gas supplier	**/raw data/**	- Raw Data El Verde 6thMP: Version 1, 08/03/2019 Version 2, 18/04/2019 Version 3, 30/05/2019 Version 4, 29/05/2019 Version 3, 30/05/2019 Version 7, 20/04/2020 - Electricity Invoices issued by CFE covering the MP -LP gas Invoices covering the MP -Raw data downloaded directly from online Landtech data base.	N/A	PP
24.	INFRA	**/SPAN/**	Span gases quality certificates by INFRA	N/A	PP
25.	IECASA	**/moist/**	- Spread sheet correlation Moisture vs T - Moisture content report IECASA, Leon, Feb 2011.	N/A	PP

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 11. CLs from this validation

CL ID	xx	**Section no.**		**Date:** DD/MM/YYYY
Description of CL				
N/A				
Project participant response				**Date:** DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				**Date:** DD/MM/YYYY

Table 22. CARs from this validation

CAR ID	01	**Section no.**	E.1	**Date:** 26/09/2019
Description of CAR (1st round)				

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In line with the incomplete from UNFCCC received on 26.09.2019 the following finding has been raised:

1) As per registered PDD, monitoring parameter “volumetric fraction of H2O in time interval t on a dry basis (vH2O,t,db)” is estimated using equation (8) of the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” version 3.0, for wet gaseous stream. Nonetheless the parameter has been determined in a different manner. Correction is requested.
2) Registered PDD states that as per the of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream”, version 3.0, under normal operation conditions, the volumetric flow of landfill gas which is sent to flare is monitored as VLFG,sent_flare,y,db (m^3 dry gas/h) since the temperature of the landfill gas (Tt) is less than 60ºC at the flow measurement point most of the time (Option A). The same volumetric flow is named as VLFG,sent_flare,y,wb (m^3 wet gas/h) in case of wet basis of the gas, demonstrating that the temperature of the gaseous stream (Tt) is more than 60ºC at the flow measurement point following by converting the measured volumetric flow from wet basis to dry basis(Option B). Further, the submitted Monitoring Report, Verification report and Spreadsheets provide the values of the volumetric flow in normalized cubic meters (Nm3). However, as per the applied methodological tool ""Tool to determine the mass flow of a greenhouse gas in a gaseous stream”, version 3.0, particularly Options A and B applied by the project activity, the volumetric flow of landfill gas shall be monitored in operation conditions. Clarification is requested.
3) Methane density (DCH4), page 13 of the MR – by scanning through ACM0001 Version 18, we view that the way DCH4 is determined is not in accordance with ACM0001 Version 18. On further looking we observed that the applied approach is defined until ACM0001 Version 11 and after that subsequent version of meth has different provision. So, parameter DCH4 is not in accordance with applied methodology. Clarification is requested.

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Project participant response | **Date:** 30/09/2019

1) During the first crediting period, the CDM-PDD did not have any reference to the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” to correct the flow to dry basis when the temperature was greater than 60ºC and there was not guidance to properly apply it. Moreover, considering that during the monitoring period no separate monitoring of temperature and pressure is necessary since the PP is using flowmeters that automatically express LFG volumes in normalized cubic meters, there is no measurement of the pressure of the gas to apply the Option 2 (Simplified calculation without measurement of the moisture content) of the "Tool to determine the mass flow of a GHG in a gaseous stream" version 3.0

   Considering such situation, for the first submission of this monitoring period, rather than using the using equation (8) of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" version 3.0, the PP hired the third party consultancy IECASA to measure the moisture content of the gas (vH2O,t,db) as can be evidenced with the “Moisture Content Report_Leon_Feb-11”. The experiment was conducted by artificially (i.e increasing the booster’s suction) increasing the temperature of the gas above 60ºC and measuring the moisture content of the gas to find a correlation between the temperature of the gas and its moisture content, as follows:

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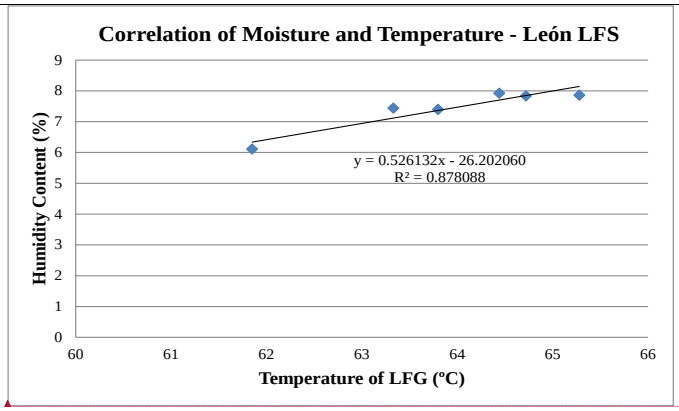
Temperature LFG (ºC)	vH2O,t,db (%)
63.33	7.429
61.85	6.103
64.44	7.916
64.72	7.828
63.80	7.389
65.28	7.852

Using the above values, the correlation was plotted as follows:



In the first submission of the current monitoring period, the PP corrected the monitored values of the parameter "VLFG,sent_flare,y,db" to dry basis for the cases when T exceeded the 60ºC using the following correlation based on the data measured by IECASA in the "Moisture Content Report_Leon_Feb-11":

vH2O,t,db (%) = 0.526132*T (ºC) - 26.202060
In such first submission, the volumetric flow of the gaseous stream in time interval t on a dry basis (vi,t,db) was determined by converting the volumetric flow from wet basis to dry basis as per Option B (Eq. 7) of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" version 3.0, as follows:
vi,t,db = vi,t,wb / (1+ vH2O,t,db)

Since the monitoring parameter "volumetric fraction of H2O in time interval t on a dry basis (vH2O,t,db)" might have not been estimated as per the provisions defined under registered PDD in the first submission of this monitoring period, for the second submission of this monitoring period the PP has decided to conservatively disregard all flows values when the temperature was greater than 60ºC, which accounts for 10% of the landfill gas which is sent to flare as per the following table:

Basis	Parameter	Nm3	% Prevailed
Wet Basis	VLFG,sent_flare,y,wb	639,491	10%
Dry Basis	VLFG,sent_flare,y,db	5,845,108	90%
Operational Basis	**VLFG,sent_flare,y**	**6,484,599**	**100%**

The changes are applied in the sheet "Error" of the file under the name "Raw Data_El Verde_6th MP_v5 xlsx" for the monitored values, which are later on used in the fifteen Monthly ER Spreadsheets under the name "00.ER Spreadsheet_6thMP_Leon_v5_mmm-yy.xlsx", from which totalized monthly values are summarized in the file "ER Summary_6thMP_v5_Leon.xlsx".

2) The PP would like to clarify that the volumetric flow of landfill gas has been firstly monitored under operational conditions in conjunction with the temperature of the landfill gas (Tt). The reported value in the Monitoring Report, Verification report and Spreadsheets as VLFG,sent_flare,y,db (m³ dry gas/h) is determined once it has been confirmed that the temperature of the landfill gas (Tt) is less than 60ºC at the flow measurement point. Therefore, the thermo-mass flowmeter measures the operational conditions and by comparison with the temperature of the landfill gas (Tt), the volumetric flow of landfill gas is considered in the Spreadsheet as VLFG,sent_flare,y,db (m³ dry gas/h) or VLFG,sent_flare,y,wb (m³ wet gas/h) depending on whether the flow falls under Option A (Tt > 60ºC) or B (Tt < 60ºC), respectively. For this monitoring period, as per the previous response, most of the time (90% of the monitoring flow values) were considered in dry conditions (Tt less than 60ºC) under Option A and has conservatively disregarded all the values for the parameter VLFG,sent_flare,y,wb (m³ wet gas/h) under Option B when temperature of the gaseous stream (Tt) was more than 60ºC at the flow measurement point.
3) In the first submission of the current monitoring period, the parameter density of methane at normal conditions (DCH4) was used in the ex ante calculation of emission reductions as shown in "Appendix 4. Further background information on ex ante calculation of emission reductions" of the registered CDM-

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PDD with the value of 0,0007168 tCH4/m3CH4 to convert FCH4,PJ, from tonnes to Nm3 of CH4 to determine the volumetric flow of landfill gas the as per the "Emissions from solid waste disposal sites" (Version 08.0), which was implicitly required by ACM0001 Version 18.

In this second submission of the current monitoring period, the value of the parameter density of methane at normal conditions (ρCH4,n) has been updated as 0.716 kg/m3 (or 0.0007160 tCH4/m3CH4, depending on the case and the units used) as per the Table 1 (page 9) of the methodological tool "Project emissions from flaring" (version 02.0.0),), which is implicitly required by ACM0001 Version 18. Please notice that the measurement method of the volumetric flow of landfill gas is based in the thermal principle of the thermal mass flowmeter so no separate monitoring of temperature and pressure is necessary to determine the density since the flowmeters automatically express LFG volumes in normalized cubic meters.

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Documentation provided by project participant

MR ver. 5

DOE assessment	**Date:** 07/10/2019

1) In line with the clarification provided by the PP, during the first crediting period, the CDM-PDD did not have any reference to the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" to correct the flow to dry basis when the temperature >60ºC, and the PP provided an alternative method in line with thermodynamics principles and such situation was not updated in renewal of the crediting period. The PP decision to conservatively disregard all flows values T > 60ºC (wet basis) is correct and in line with the registered PDD choices and also the re-calculated ER value is conservative; this is verified in columns D and E of spreadsheet /error/ in xls file Raw_Data_El_Verde_6MP_v5.
2) As described in appendix 5 of this report the parameter VLFG,sent_flare,y,db (m^3 dry gas/h) is measured continuously by a flow meter at normal pressure and temperature and registered electronically by the system Landtec. The meter provided the "Normal" flow values adjusted by P and T so no further adjust is required. As stated in the previous point the PP decided to not consider in the ER calculation the values of parameter VLFG,sent_flare,y,wb (m^3 wet gas/h) under Option B, such decision is in line with registered PDD and the calculation is conservative, this is verified in columns D and E of spreadsheet /error/ in xls file Raw_Data_El_Verde_6MP_v5.
3) The methane density ρCH4,n is expressed in different units 0.716 kg/m3 (or 0.0007160 tCH4/m3CH4) as per methodological tools, nonetheless the value applied for the ER calculation is correct, this is verified in rows 33, 39 and 45 of spreadsheet ER Summary_6th MP_v5. The ρCH4,n values provided in section D.1 of the MR version 5 is in line with the applied methodological tools as per registered PDD.

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CAR is closed.

CAR ID	CAR 02	**Section no.**	D.2	**Date:** 31/03/2020

Description of CAR (1st round)

As shown in the calculation spreadsheets the flare efficiency is determined/calculated every two minutes instead of each minute which is required by the monitoring plan and the applied tool Project emissions from flaring" (Version 02.0.0)

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Furthermore, the required monitored parameters by the tool to determine the flare efficiency:

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- ✓ Volumetric flow of the residual gas on a dry basis at reference conditions in the minute m
- ✓ Mass flow of the residual gas on a dry basis at reference conditions in the minute m
- ✓ Volumetric fraction of O2 in the exhaust gas on a dry basis at reference conditions in the minute m
- ✓ Concentration of methane in the exhaust gas of the flare on a dry basis at reference conditions in the minute m
- ✓ Mass flow of methane in the residual gaseous stream in the minute m
- ✓ Volumetric fraction of methane in the residual gas on a dry basis in the minute m

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are also not averaged on a minute basis as required by the tool.

This deviation has not been properly reported in MR

Project participant response	**Date:** 20/04/2020

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The flare efficiency is determined/calculated every two minutes instead of each minute as required by the monitoring plan and as per option B.2 of the tool "Project emissions from flaring" (Version 02.0.0). Furthermore, the required monitored parameters by the tool to determine the flare efficiency have not been averaged on a minute basis as required by the tool neither. The PP has applied a temporary deviation from the registered monitoring plan considering that the monitoring system would need to be updated (inclusion of extra monitoring data from extra flowmeters, pressure meters amongst other technical updates such as the gathering frequency) once the Phase 2 finishes its commissioning stage.
Documentation provided by project participant
MR v7
DOE assessment **Date:** 21/04/2020
When the project was originally registered, the methodological tool requested a continuous monitoring of the flare efficiency, but not specifically the determination/calculating every minute, so the project was designed with a data gathering system with two minutes determination/calculating frequency. When the CP was renewed the applicable tool "Project emissions from flaring" (Version 02.0.0) requests the determination/calculating specifically each minute. This change was not envised at renewal of the CP, furthermore such change requires new investment in equipment, so it is understandable that at this stage of the verification is not possible to upgrade the monitoring system to correct the deviation. The PP is contemplating the upgrade of the monitoring system when the electricity generation phase begins. The finding is closed

Table 33. FARs from this validation

~~**FAR ID**~~	~~xx~~	~~**Section no.**~~		~~**Date:** DD/MM/YYYY~~
~~**Description of FAR**~~				
~~*N/A*~~				
~~**Project participant response**~~				~~**Date:** DD/MM/YYYY~~
~~**Documentation provided by project participant**~~				
~~**DOE assessment**~~				~~**Date:** DD/MM/YYYY~~

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Formatiert: Nicht Hervorheben
Formatiert: Block
Formatiert: Block
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Formatiert: Durchgestrichen
Formatiert: Englisch (Vereinigtes Königreich), Durchgestrichen
Formatiert: Durchgestrichen
Formatiert: Englisch (Vereinigtes Königreich), Durchgestrichen
Formatiert: Englisch (Vereinigtes Königreich), Durchgestrichen
Formatiert: Englisch (Vereinigtes Königreich), Durchgestrichen
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Formatiert: Englisch (Vereinigtes Königreich), Durchgestrichen
Formatiert: Durchgestrichen
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Document information

Version	*Date*	*Description*
03.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM validation and verification standard for project activities" (CDM-EB93-A05-STAN); • Make editorial improvements.
02.0	31 October 2017	Revision to align with the requirements in the "CDM validation and verification standard for project activities" (version 01.0).
01.0	23 March 2015	Initial publication.

Decision Class: Regulatory
Document Type: Form
Business Function: Registration
Keywords: post-registration change, project activities, validation report

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