

 <p style="text-align: center;">Verification and certification report form for CDM project activities</p> <p style="text-align: center;">(Version 02.1)</p>	
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	Catalytic N ₂ O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co. UNFCCC ID: 0490
Version number of the verification and certification report	01.0
Completion date of the verification and certification report	04/04/2019
Monitoring period number and duration of this monitoring period	Monitoring period 33 (Monitoring period 6 of 2 nd crediting period) Duration: 14/02/2018 – 10/01/2019
Version number of monitoring report to which this report applies	01.1
Crediting period of the project activity corresponding to this monitoring period	15/09/2013 – 14/09/2020 (including both days)
Project participants	Carbon Egypt Ltd.; RWE Power AG; CARBON Climate Protection GmbH
Host Party	Arab Republic of Egypt
Applied methodologies and standardized baselines	CDM Methodology: ACM0019 Version 02.0 ("N ₂ O abatement from nitric acid production") No standardized baseline(s) applicable
Mandatory sectoral scopes linked to the applied methodologies	Scope: 5 / Technical Area: 5.2
Conditional sectoral scope(s) linked to the applied methodologies	NA
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	1,159,599 tCO _{2e}

Certified amount of GHG emission reductions or GHG removals for this monitoring period	1,198,544 tCO _{2e}
Name and UNFCCC reference number of the DOE	TÜV NORD CERT GmbH, E-0022
Name, position and signature of the approver of the verification and certification report	Kunal Rami; Final Approver

SECTION A. Executive summary

CARBON Climate Protection GmbH has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 33rd periodic verification (which is the 6th verification of the 2nd crediting period) of the project:

“Catalytic N₂O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.”

with regard to the relevant requirements for CDM project activities. The verification team has reviewed the implementation of the monitoring plan in the registered CDM project.

This verification covers the period from 14/02/2018 to 10/01/2019 (including both days) of the above mentioned UNFCCC registered project activity.

Description of the PA

Carbon Egypt has implemented a project for GHG emission reduction by catalytic N₂O destruction. The project encompasses a tertiary technology for the N₂O reduction in the tail gas stream of the nitric acid production plant of Abu Qir Fertilizer Co. in Abu Qir, Egypt (Abu Qir II Nitric acid plant). Nitrous oxide that is formed as a by-product of the nitric acid production is removed by an EnviNOx®-System. The system comprises one reactor with two catalyst beds where nitrogen oxides (NO_x) are catalytically reduced in the first bed by using ammonia as the reducing agent and nitrous oxide (N₂O) in the second bed by using natural gas as reducing agent. The reaction products from the catalytic reactions of N₂O and NO_x are nitrogen, water and carbon dioxide. The tail gas from the nitric acid facility is fed into the EnviNOx®-System. The stack gas volume flow rate and the nitrous oxide concentration at the outlet of the EnviNOx®-System are monitored and recorded. The natural gas used in the catalytic reduction is monitored in order to calculate the non-N₂O emissions of the PA.

Details of the project location are given in table A-1 below:

Table A-1: Project Location

No.	Project Location
Host Country	Arab Republic of Egypt
Region:	Al-Iskandariyah Province (Alexandria Province)
Project location address:	Abu Qir
Latitude:	N31.272513°
Longitude:	E30.09755°

Basic technical details of the project are summarized in table A-2.

Table - A-2: Technical data of the PA

Parameter	Unit	Value
Maximum annual production	t/a	700,800
Operating pressure	barg	3.83
AOR design temperature range	°C	850 – 910
Historical emission factor	kgN ₂ O/ t HNO ₃	7.23

Scope of the Verification & Verification Process

The verification of this registered project is based on the validated project design document ^{/PDD/}, the monitoring report ^{/MR/}, emission reduction calculation spread sheet ^{/XLS/}, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The verification is carried out on the basis of the following requirements, applicable for this project activity:

- Article 12 of the Kyoto Protocol ^{/KP/},
- guidelines for the implementation of Article 12 of the Kyoto Protocol as presented in the Marrakech Accords under decision 3/CMP.1 ^{/MA/}, and subsequent decisions made by the Executive Board and COP/MOP,
- other relevant rules, including the host country legislation,
- CDM Validation and Verification Standard ^{/VVS/},
- monitoring plan as given in the registered PDD ^{/PDD/},
- Approved CDM Methodology ^{/ACM19/}.

The verification consisted of the following steps:

- Contract review,
- Appointment of team members and technical reviewers,
- Publication of the monitoring report,
- A desk review of the Monitoring Report ^{/MR/} submitted by the client and additional supporting documents with the use of customised verification protocol ^{/CPM/} according to the Validation and Verification Standard ^{/VVS/},
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting,
- Resolution of corrective actions (if any),
- Final verification reporting verifying and certifying the reported ER for the “Catalytic N₂O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.” for the period in accordance with paragraph 62 of CDM modalities and procedures,
- Technical review,
- Final approval of the verification.

Conclusion

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated PDD.
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., ACM0019 ver. 02.0.
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately..
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 33rd periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

GHG ER: 1,198,544 tCO_{2e}

SECTION B. Verification team, technical reviewer and approver

B.1. Verification 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	Interview(s)	Verification findings
1.	Team Leader	EI	Kochaniewicz	Grzegorz	-	x	x	x	x
2.	Team Member	IR	Winter	Rainer	TÜV NORD CERT	x	x	x	x

B.2. Technical reviewer and approver of the verification and certification report

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

Please refer to Appendix 2 below for demonstration of how the team meets the competence required for the verification.

SECTION C. Application of materiality

C.1. Consideration of materiality in planning the verification

In order to ensure a complete, transparent and timely execution of the verification task, the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Materiality Threshold

The verification is based on the materiality threshold identified in table C-1 below:

Table C-1: Applied Materiality Threshold

	Threshold	Related to
<input checked="" type="checkbox"/>	0.5 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal equal to or more than 500,000 tonnes of carbon dioxide equivalent per year ¹ ;
<input type="checkbox"/>	1 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal of between 300,000 and 500,000 tonnes of carbon dioxide equivalent per year;
<input type="checkbox"/>	2 %	Emission reductions or removals for registered large-scale CDM project activities achieving a total emission reduction or removal of 300,000 tonnes of carbon dioxide equivalent per year or less;
<input type="checkbox"/>	5 %	Emission reductions or removals for registered small-scale CDM project activities other than registered CDM project activities covered under next category below;
<input type="checkbox"/>	10 %	Emission reductions or removals for the type of registered CDM project activities referred to in decision 3/CMP.6, paragraph 38 (referred to as microscale project activities).

Strategic Analysis

At the beginning of the verification the verification team leader has assessed the nature, scale and complexity of the verification tasks by carrying out a strategic analysis of all activities relevant to the PA. The team leader has collected and reviewed the information relevant to assess that the designated verification team is sufficiently competent to carry out the verification and to ensure that it is able to conduct the necessary risk analysis.

Risk analysis and detailed audit testing planning

For the identification and assessment of potential reporting risks and to determine the necessary detailed audit testing procedures for residual risk areas the following table is used.

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Installation of monitoring equipment	Low	Wrong installation of monitoring equipment	Check of monitoring equipment, esp. with

¹ A year refers to a period of 12 consecutive months.

			<i>might lead to wrong results</i>	<i>regards to appropriateness of the location</i>
2.	<i>Dysfunction of installed equipment</i>	<i>Medium</i>	<i>Dysfunction of equipment might lead to wrong measuring results</i>	<i>Check of operational data</i>
3.	<i>Exchange of measurement equipment</i>	<i>Medium</i>	<i>Exchange of measurement equipment might lead to incorrect data processing</i>	<i>Check of serial-numbers of installed measurement equipment</i>
4.	<i>Wrong or insufficient quality assurance of monitoring equipment</i>	<i>High</i>	<i>Wrong or insufficient QA/QC might lead to incorrect monitoring results</i>	<i>Check of</i> <ul style="list-style-type: none"> - <i>calibration intervals</i> - <i>calibration certificates</i> - <i>QAL 2 report</i> - <i>QAL 3 records</i> - <i>Qualification records of involved entities and personnel</i>
5.	<i>Delayed or wrong implementation of formulae and algorithms</i>	<i>Medium</i>	<i>It has to be ensured that e.g. calibration functions are correctly implemented</i>	<i>Check of data aggregation trails, spreadsheet programming, IT Systems etc.</i>
6.	<i>Incomplete data</i>	<i>High</i>	<i>Data gaps shall be addressed in line with applicable rules</i>	<i>The completeness of data was checked in detail during the on-site visit. Further crosschecking was done to ensure data quality.</i>
7.	<i>Mistakes in data transfer</i>	<i>High</i>	<i>The likeliness of data transfer mistakes is considered low where automatic procedures are applied and high where manual aggregation is required</i>	<i>Check of</i> <ul style="list-style-type: none"> - <i>Data aggregation trails</i> - <i>IT systems</i> - <i>Spreadsheet programming</i> - <i>Data protection measures</i> - <i>Responsibilities</i>
8.	<i>Wrong usage of emission factors, coefficients etc.</i>	<i>Low</i>	<i>Such factors may not be applicable for current conditions</i>	<i>Check of relevant parameters, e.g. GWP, molecular masses etc.</i>

On the basis of the risk analysis the verification has been planned under consideration and in accordance with the “Guideline of application of materiality in verifications”. A detailed audit / verification plan has been prepared and submitted to the PPs in due time before the site visit.

C.2. Consideration of materiality in conducting the verification

Based on the verification planning the verification has been carried out. The concept of materiality has been considered. A breakdown of the chosen approaches is included in the following table.

Parameter	Approach+	Errors* detected	Findings reference	Correc- ted	Remaining verification risk
$P_{production,y}$	CDC	<input checked="" type="checkbox"/>	CAR 1	<input checked="" type="checkbox"/>	low
h_y	CDC	<input type="checkbox"/>	-	<input type="checkbox"/>	low
$h_{r,y}$	CDC	<input type="checkbox"/>	-	<input type="checkbox"/>	low
$V_{t,db}$	COM	<input type="checkbox"/>	-	<input type="checkbox"/>	low
$V_{i,t,db}$	COM	<input type="checkbox"/>	-	<input type="checkbox"/>	low
$C_{H2O,t,db,n}$	COM	<input type="checkbox"/>	-	<input type="checkbox"/>	low
$FC_{i,j,y}$	COM	<input checked="" type="checkbox"/>	CAR 2	<input checked="" type="checkbox"/>	low
$WC_{i,y}$	CDC	<input type="checkbox"/>	-	<input type="checkbox"/>	low
$\rho_{i,y}$	COM	<input type="checkbox"/>	-	<input type="checkbox"/>	low
Aggregate					Materiality threshold not exceeded

*) incl. omissions and misstatements

+) Verification Approaches:

- CDC: Complete data check of data including all data aggregation steps
 NDC: Non-complete data check – omissions not material
 SPL: Sampling approach (all data available)
 ASP: Acceptance Sampling
 COM: Data check at higher data aggregation levels and sampling at original data levels

The verification was basically carried out as per the verification plan. However, based on the actual situation on-site and the errors, omissions and misstatements identified during the verification minor deviations from the original plan occurred. However, due to their insignificance no major revision of the overall plan was required. Esp. there was no need for significant modification of the sampling approaches or for additional / less locations to be visited during the on-site.

SECTION D. Means of verification

D.1. Desk /document review

During the desk review all documents initially provided by the PPs and publicly available documents relevant for the verification were reviewed. According to VVS for PA the desk review involved the following tasks:

- A review of the data and information presented to verify their completeness;
- A review of the monitoring plan and monitoring methodology, including applicable tools, paying particular attention to the frequency of measurements, the quality of metering equipment and calibration requirements, and the QA/QC procedures;
- An evaluation of data management and the QA/QC system.

All reviewed documents or references are listed in Appendix 3 of this report. The main documents are listed below:

- the last revision of the PDD including the monitoring plan^{/PDD/},
- the last revision of the validation report^{/VAL/},
- documentation of previous verifications^{/VER/}
- the MR, including the claimed emission reductions for the project^{/MR/},
- the emission reduction calculation spreadsheet^{/XLS/}.

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

D.2. On-site inspection

As most essential part of the verification exercise it is indispensable to carry out an inspection on-site. According to VVS, version 02.0 the on-site assessment involved the following tasks:

- (i) An assessment of the implementation and operation of the registered project activity as per the registered PDD;
- (ii) A review of information flows for generating, aggregating and reporting the monitoring parameters;
- (iii) Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the registered PDD;
- (iv) A cross check between information provided in the MR and data from other sources;
- (v) A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the registered PDD and the selected methodology and corresponding tools;
- (vi) A review of calculations and assumptions made in determining the GHG data and emission reductions;
- (vii) An identification of QA/QC procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

Hence, the main activities covered during the on-site visit included, but were not limited to:

Duration of on-site inspection: 19/02/2019 to 20/02/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening meeting	AFC	19/02/2019	G.Kochaniewicz R. Winter
2.	Check of changes with regards to operational, legal and organisational issues	AFC	19/02/2019	G.Kochaniewicz R. Winter
3.	<i>Check of production site</i> - <i>Main equipment (with focus on changes)</i> - <i>Installed monitoring equipment</i> - <i>Analyser cabinet</i> - <i>Laboratory</i>	AFC	19/02/2019	G.Kochaniewicz R. Winter
4.	Check of calibration records	AFC	20/02/2019	G. Kochwiewicz
5.	Check of QAL 2 and QAL 3 records	AFC	20/02/2019	R. Winter
6.	Data check including complete data aggregation, calculations and assumptions	AFC	20/02/2019	G. Kochwiewicz R. Winter
7.	Closing meeting	AFC	20/02/2019	G.Kochaniewicz R. Winter

D.3. Interviews

During the on-site visit the verification team performed interviews with the PPs to confirm selected information and to resolve issues identified in the document review.

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Bichler	Sonja	CARBON Climate Protection GmbH	19-20/02/2019	General aspects, Monitoring report, ER calculation	G. Kochaniewicz, R. Winter
2.	Ashour	Fatehy	CARBON Climate Protection GmbH	19-20/02/2019	General aspects, Monitoring report, ER calculation, Instrumentation, reading and calibration procedure	G. Kochaniewicz, R. Winter
3.	Roshdy	Mahmoud	CARBON Climate Protection GmbH	19-20/02/2019	General aspects, Monitoring report, ER calculation, Instrumentation, reading and calibration procedure	G. Kochaniewicz, R. Winter
3.	Ashraf	Saber	AFC	20/02/2019	Environmental aspects	G. Kochaniewicz, R. Winter
4.	Walid	Abdou	AFC	20/02/2019	Head of QHSE & Safety	G. Kochaniewicz, R. Winter

D.4. Sampling approach

D.4.1 Sampling during monitoring

<input checked="" type="checkbox"/>	No sampling approach has been used by the PP to determine the monitored parameters				
<input type="checkbox"/>	A sampling approach has been taken for the following monitored parameter(s):				
	Parameter	Sampling approach ¹⁾	Sampling Type ²⁾	Population	Sample Size
	N/A				

¹⁾ Sampling Approaches:

SiRS: Simple Random Sampling
 StRS: Stratified Random Sampling
 SS: Systematic Sampling
 CS: Cluster Sampling
 MSS: Multi-stage Sampling

²⁾ Sampling Types:

PS: Parameter Sampling

D.4.2 Sampling approaches during verification

<input type="checkbox"/>	No sampling approach has been used by the VT to verify the monitored parameters				
<input checked="" type="checkbox"/>	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
	$V_{t,db,n}$	OS ^{*)}	COM	all days	all days
	$V_{i,t,db}$	OS ^{*)}	COM	all days	all days

¹⁾ Sampling Approaches:

SiRS: Simple Random Sampling

StRS: Stratified Random Sampling

SS: Systematic Sampling

CS: Cluster Sampling

MSS: Multi-stage Sampling

*) OS: Other Sampling: Checksum Analysis

²⁾ Sampling Types:

AS: Acceptance Sampling

PS: Parameter Sampling

COM: Full data check at higher data aggregation levels and sampling at original data levels

No sampling approach has been used by the PPs to determine the ER for the current monitoring period. Hourly average values of all continuous monitored values have been made available to the verification team. The validation team has used no sampling approach. The complete data aggregation has been checked without any sampling approaches. The hourly values have been derived automatically from the DeltaV System. Only in order to check the correct aggregation and transfer of data original data recordings have been checked. Due to the automatic system behind this step a procedural check has been carried out. For this purpose a checksum analysis has been carried out. No data transfer problems have been observed.

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form (E.1)	0	0	0
Compliance of the project implementation with the registered PDD (E.3)	0	0	0
Post-registration changes (E.4)	0	0	0
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline (E.5)	0	0	0
Compliance of monitoring activities with the registered monitoring plan (E.6)	0	0	0
Compliance with the calibration frequency requirements for measuring instruments (E.7)	1	0	0

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Assessment of data and calculation of emission reductions or net removals (E.8)	0	2	0
Others ² ("Editorial changes")	2	0	0
Total	3	2	0

All findings were satisfactorily addressed by the PPs. For a detailed list of all CARs, CLs and FARs raised in the course of the verification, please refer to Appendix 4.

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	<p>A draft MR was submitted to the verification team by the PPs. The DOE has made this report publicly available prior to the start of the verification activities. No comments were received.</p> <p>By means of the UNFCCC website it has been checked whether the latest applicable MR template CDM-MR-FORM has been used.</p> <p>Further it has been checked whether the latest instructions for filling out the MR template have been followed. Every section has been checked against the respective guidance.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /MRT/ • /unfccc/ 	
Findings	<input checked="" type="checkbox"/>	The latest reporting template CDM-MR-FORM (version 06.0) as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.
	<input type="checkbox"/>	The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.
	<input checked="" type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: CL 1: Where reference is made to the ISO standards 9001 and 14001 the penultimate versions are mentioned in the MR (v. 01.0) CL 2: In the MR (v. 01.0) under section C page 12 reference is made to UHDE GmbH. It should be checked whether this is still correct.
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The verification team confirms that the project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The verification team confirms that the monitoring report is complete and transparent and in accordance with the latest reporting template, the registered PDD and other relevant requirements.

E.2. Remaining forward action requests from validation and/or previous verifications

During the validation the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose FARs might have been raised. Likewise FARs might have been raised in the course of previous verifications.

² not related to section E

In the course of this verification the latest version of the PDD^{/PDD/} and the previous verification report^{/VER/}, where applicable, have been checked in order to identify any remaining forward action requests. For the current monitoring period the following applies:

(i) Open issues from validation:

<input checked="" type="checkbox"/>	There were no open issues which have been addressed in the latest version of the validation report.
<input type="checkbox"/>	All open issues from the validation have been appropriately addressed in the context of previous verifications.
<input type="checkbox"/>	All issues related to the validation have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the validation have not yet been appropriately addressed (for details please refer to appendix 4): - N/A

(ii) Open issues from previous verifications:

<input type="checkbox"/>	N/A – as this is the first monitoring period for this CDM PA.
<input checked="" type="checkbox"/>	There were no open issues which have been addressed in the previous verification report
<input type="checkbox"/>	All issues related to the previous verification have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the previous verification have not yet been appropriately addressed (for details please refer to appendix 4): - N/A

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	<p>By means of an in-depth review of the PDD in its latest version – as downloaded from the UNFCCC project site – and the checks carried out during the on-site visit an assessment in accordance with applicable verification requirements has been carried out whether the project has been implemented and operated in line with the latest approved version of the PDD and whether all physical features of the project are in place. The following has been checked: implemented technology, project equipment as well as monitoring and metering equipment.</p> <p>Further it has been checked if relevant technical equipment of the PA has been exchanged or modified during the monitoring period and consistent notations of key equipment (meters etc.) in PDD, MR and calculation spreadsheet are applied.</p> <p>Furthermore, special events such as NA plant shutdowns and other out of operation times of the plant have been checked.</p> <p>Interviews with responsible personnel have been carried out, QMS records, maintenance records, instrument specifications were checked in this context. Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred.</p> <p>Further it has been checked whether any observed deviations from the registered project design have been correctly addressed as described in the PRC.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /MR/ • /VVS/
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	<ul style="list-style-type: none"> • /XLS/ • /QMS/ • /MTR/ • /unfccc/ 	
Findings	<input checked="" type="checkbox"/>	The project has been implemented and is operated as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.
	<input type="checkbox"/>	The following deviations from the registered / approved project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): - N/A
	<input type="checkbox"/>	In this context the following CARs, CLs have been raised: - N/A
	<i>In case of phased implementation:</i>	
	<input checked="" type="checkbox"/>	N/A
	<input type="checkbox"/>	The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.
	<input type="checkbox"/>	The description in section 3.1 of the MR differs in content or the level of detail from the latest version of the PDD. However, the description in the MR is correct and reflects the situation during the site inspection.
	<input type="checkbox"/>	The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The verification team confirms that the project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The project is fully implemented and has been in operation since October 2006. Further the DOE has checked the plant shutdowns against onsite inspected raw data as well as interviews with operational personnel.	

E.4. Post-registration changes

- ☒ By means of site visit, document check and interview it could be verified that the project is implemented and operated in line with the registered PDD and the applied methodology.
- ☒ Post registration changes have been identified and are assessed in detail in the subsequent steps E.4.1 to E.4.7.

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

<input type="checkbox"/>	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been submitted to the UNFCCC prior to the current monitoring period.
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<input checked="" type="checkbox"/>	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	Technical adaption of monitoring equipment after renewal of crediting period
		Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved (approval No.: PRC-0490-001)
		Appr.date	19/08/2014
		Ref. No.	PRC-0490-001
	2	Title	-
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.:)
		Appr.date	-
		Ref.No.	-
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		
	1	Issue:	-
	2	Issue:	-
<input type="checkbox"/>	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	-

No further comments.

E.4.2. Corrections

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this MR. The result is summarized in the table below.

<input checked="" type="checkbox"/>	The following corrections have been approved or are under approval by the UNFCCC		
	1	Title	Measurement of the parameter $C_{H_2O,t,db,n}$
		Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved (approval No.: PRC-0490-002)
		Appr.date	05/03/2018
		Ref. No.	PRC-0490-002
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.:)
		Appr.date	
		Ref.No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for (further) corrections has been identified.		
<input type="checkbox"/>	The following corrections have been applied:		
	1	Issue:	-
	2	Issue:	-

	The PDD has been revised accordingly: (New) version No.: Revision date:
	It is confirmed that the updated / corrected information is an accurate reflection of the actual project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.
	<input type="checkbox"/> A related PRC is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.

No further comments.

E.4.3. Changes to the start date of the crediting period of the project activity

<input checked="" type="checkbox"/>	N/A - as this is not the first verification within the crediting period
<input type="checkbox"/>	The PPs do not intend to change the start date of the crediting period.
<input type="checkbox"/>	As the change in the start date was below the related time period as indicated in PS § 277 and § 278 no prior approval was required but only a notification. This notification has been submitted by the PP without involvement of the DOE. The change and new start date has been checked from the related UNFCCC project webpage.
<input type="checkbox"/>	The PPs intend to change the start date of the crediting period. As the intended change in start date beyond the related time period as indicated in PS § 279 prior approval by the Board is required. For detailed assessment of the change please refer to related PRC validation report. As per assessment in this report the DOE confirms that the change to the start date of the crediting period are in line with the related requirements of the VVS and PS.
<input type="checkbox"/>	The approval to change the start date of the crediting period has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z

E.4.4. Inclusion of a monitoring plan

<input checked="" type="checkbox"/>	N/A - as this monitoring plan was part of the registered PDD
<input type="checkbox"/>	In line with PS § 281 or § 282 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 282 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC..
<input type="checkbox"/>	In line with § 282 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other applied standards or tools

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this MR. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period		
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC		
	1	Title	-
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref. No.	
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref.No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	An approval of the following PCfrMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
	1	Issue:	
	2	Issue:	
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

E.4.6. Changes to the project design

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this MR. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No CoPD has been submitted to the UNFCCC prior to the current monitoring period		
<input type="checkbox"/>	The following CoPD have been approved or are under approval by the UNFCCC		
	1	Title	-
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref. No.	
	2	Title	-
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref.No.	

<input checked="" type="checkbox"/>	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA	
<input type="checkbox"/>	An approval of the following CoPD is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.	
	1	Issue: -
	2	Issue: -
<input type="checkbox"/>	The following CoPD for which appendix 1 of the PS is applicable have been applied:	
	1	Issue: -
	2	Issue: -

E.4.7. Types of changes specific to afforestation and reforestation project activities

<input type="checkbox"/>	N/A - as this monitoring plan was part of the registered PDD
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E.5. Compliance of registered monitoring plan with the methodology including applicable tools and standardized baselines

Means of verification	By means of comparison of the MR with (i) the applied CDM methodology (ii) all applicable CDM methodological tools and (iii) if applicable, a standardized baseline the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology/tools/SB. The following sources of information have been used in this context: <ul style="list-style-type: none"> • /MR/ • /ACM19/ • /TA/ • /unfccc/ 								
Findings	<input checked="" type="checkbox"/>	The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD) and approved PRC.							
	<input checked="" type="checkbox"/>	The breakdown of MP accordance of the referenced tools is as follows:							
		1	<table border="1"> <tr> <td>Title (of the tool)</td> <td>Tool to calculate project or leakage CO2 emissions from fossil fuel combustion</td> </tr> <tr> <td>Version</td> <td>02</td> </tr> <tr> <td>MP compliance</td> <td> <input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP) </td> </tr> </table>	Title (of the tool)	Tool to calculate project or leakage CO2 emissions from fossil fuel combustion	Version	02	MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
Title (of the tool)	Tool to calculate project or leakage CO2 emissions from fossil fuel combustion								
Version	02								
MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)								
		2	<table border="1"> <tr> <td>Title (of the tool)</td> <td>Tool to determine the mass flow of a greenhouse gas in a gaseous stream</td> </tr> <tr> <td>Version</td> <td>02.0.0</td> </tr> <tr> <td>MP compliance</td> <td> <input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A </td> </tr> </table>	Title (of the tool)	Tool to determine the mass flow of a greenhouse gas in a gaseous stream	Version	02.0.0	MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A
Title (of the tool)	Tool to determine the mass flow of a greenhouse gas in a gaseous stream								
Version	02.0.0								
MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A								
	<input type="checkbox"/>	The breakdown of MP accordance of the applicable SB is as follows:							
		1	<table border="1"> <tr> <td>Title (of the SB)</td> <td>N/A</td> </tr> <tr> <td>Version</td> <td></td> </tr> </table>	Title (of the SB)	N/A	Version			
Title (of the SB)	N/A								
Version									

			MP compliance	
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: n/a		
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.		
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
		The applied methodology subscribed applicable tools are consistent with the versions in UNFCCC website. There is no applicable SB for the PA.		

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	By means of comparison of the MR and the ER calculation with the latest version of the registered PDD the verification team has checked whether all parameters fixed ex-ante or at renewal of the crediting period have been applied correctly. The following list of ex-ante fixed parameters have been applied:				
	Nbr.	Parameter abbreviation	Description	Value	Unit
	1	Operating pressure	Operating pressure of the ammonia burner	383	kPa
	2	EF _{historical}	Historical baseline emission factor of the nitric acid plant	7.23	kg N ₂ O/t HNO ₃
	3	EF _{default,y}	Default emission factor according to the operating pressure of the ammonia burner in year y (related to 100 per cent pure acid)	7.4 (2018) 7.2 (2019)	Kg N ₂ O/t HNO ₃
	4	EF _{new,y}	Baseline N ₂ O emission factor for nitric acid production in year y (related to 100 % pure acid)	2.8 (2018) 2.7 (2019)	kg N ₂ O/t HNO ₃
	5	P _{product,max}	Design capacity of nitric acid production during the first crediting period	700,800	tHNO ₃ /a Universal ideal gases constant (R _u): 8,314 Pa m ³ /kmol K
	6	GWP _{N₂O}	Global warming potential of the nitrous oxide	298	tCO ₂ e/tN ₂ O
	7	R _u	Universal ideal gas constant	8,314	Pa*m ³ /kmol*K

	8	MM _i	Molecular mass of greenhouse gas I	44.02	kg/kmol (N ₂ O)
	9	P _n	Total pressure at normal conditions	101,325	Pa
	10	T _n	Temperature at normal conditions	273.15	K
	<p>Further it has been checked whether the GWP_{N2O} for the respective period has been correctly applied. The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/ • /PDD/ • /PS/ • /VVS/ • /unfccc/ 				
Findings	<input checked="" type="checkbox"/>	The MR and the ER calculation have considered the parameters fixed ex-ante or at the renewal of the crediting period correctly, no deviations have been observed.			
	<input type="checkbox"/>	The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification: - N/A			
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: - N/A			
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.			
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.			
	The parameters fixed ex-ante have been indicated in the latest approved PDD. The MR, ER worksheet are checked as in-line with the approved PDD.				

E.6.2. Data and parameters monitored

Means of verification	<p>During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the PDD) have been verified with regard to the</p> <ul style="list-style-type: none"> (i) appropriateness of the applied measurement / determination method, (ii) the correctness of the values applied for ER calculation, (iii) the accuracy and applied QA/QC measures. <p>The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5).</p>	
Findings	<input checked="" type="checkbox"/>	Based on the details listed in appendix 5 the verification team can confirm that all parameters have been monitored according to all applicable standards and relevant requirements.
	<input type="checkbox"/>	The following deviations from monitoring requirements have been identified in the course of this verification: N/A.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:

Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<p>It can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements as per the registered and approved PDD and its monitoring plan, approved methodology as well as the applied tools.</p> <p>Quality Management procedures for measurement, collection and compilation of data, data storage and archiving have been defined and were assessed to be appropriate for the purpose. No significant deviations thereof have been observed during the verification.</p>	

E.6.3. Implementation of sampling plan

Means of verification	<p>The verification team has checked whether the PPs have applied a sampling approach to determine the monitored values.</p> <p>Further it has been checked whether the PPs have correctly applied the implemented sampling plan including</p> <ul style="list-style-type: none"> (i) description of the implemented sampling design, (ii) collected data, (iii) analysis of collected data, (iv) demonstration on whether the required confidence/precision has been met. <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/ • /PDD/. 			
Findings	<input checked="" type="checkbox"/>	The PPs have not applied sampling approaches for the parameters monitored.		
	<input type="checkbox"/>	The PPs have applied sampling approaches for the following parameters monitored.		
		1	Parameter:	
			Name:	
			Description on how the sampling efforts and survey comply with the validated sampling plan:	
	2	Parameter:		
		Name:		
		Description on how the sampling efforts and survey comply with the validated sampling plan:		
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: - N/A		
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.		
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		

	No further comments.
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E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	<p>During the verification the relevant monitoring equipment has been checked whether the calibration requirements have been met; especially if the calibration frequency is in line with the requirements of the validated and registered PDD, with EN 14181 and/or the applicable calibration standards. The results as well as the verification procedures are described equipment-wise in the project specific verification checklist (Appendix 6). The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/ • /CAL/.
Findings	<input type="checkbox"/> Based on the details listed in appendix 6 the verification team can confirm that all installed monitoring equipment physically exist (identification by TAG numbers and serial numbers) and has been duly calibrated for this entire monitoring period. No delay of calibration has been observed.
	<input checked="" type="checkbox"/> The following issues related calibration frequency requirements have been identified in the course of this verification: For newly installed nitric acid flowmeter the calibration validity period is considered to start at the date of installation. It should be demonstrated that manufacturer's recommendations regarding the calibration validity are not exceeded for instruments that were stored prior to installation.
	<input checked="" type="checkbox"/> In this context the following CARs, CLs, FARs have been raised: CL 3.
Conclusion	<input type="checkbox"/> No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.
	<input checked="" type="checkbox"/> The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	Quality Management procedures for calibration, maintenance and training of personnel have been defined and were assessed to be appropriate for the purpose. No significant deviations thereof have been observed during the verification.

E.8. Assessment of data and calculation of emission reductions or net removals**E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks**

Means of verification	<p>During the verification the calculation of baseline GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> • <i>Transparency</i>: It has been checked whether the calculation of baseline emissions is fully traceable and the Excel calculation spreadsheet provides all calculation formulae. • <i>Parameter consistency</i>: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the MR and the Excel calculation spreadsheet. Besides the information provided in MR and/or Excel spreadsheet has been crosschecked with other sources such as plant logbooks, inventories, lab analysis, invoices. • <i>Correctness</i>: It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology. Further it has been checked whether any assumptions used have been justified. • <i>Completeness</i>: It has been checked whether all calculations are complete and without omissions as well as whether a complete set of data is available. <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/. 						
Findings	<p>The baseline GHG emissions achieved in this monitoring period have been calculated to be 1,300,973 tCO₂e.</p> <table border="1"> <tr> <td data-bbox="472 1014 539 1473"><input type="checkbox"/></td><td data-bbox="539 1014 1396 1473"> <p>The calculation of the baseline emissions was found to be fully compliant with the above stated principles.</p> <p>It was found that a complete set of data covering the monitoring period has been provided by the PPs. Activity levels and non-activity parameters have been monitored in accordance with the monitoring plan, as applicable.</p> <p>The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied SB. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information has been identified.</p> </td></tr> <tr> <td data-bbox="472 1473 539 1541"><input checked="" type="checkbox"/></td><td data-bbox="539 1473 1396 1541"> <p>The verification team has identified mistake(s) in the baseline emissions calculation or the underlying calculation approaches</p> </td></tr> <tr> <td data-bbox="472 1541 539 1630"><input checked="" type="checkbox"/></td><td data-bbox="539 1541 1396 1630"> <p>In this context the following CARs, CLs, FARs have been raised:</p> <p>CAR 1: The sum of the HNO₃ production values in the excel sheet "HNO₃ plausibility" is not correct.</p> </td></tr> </table>	<input type="checkbox"/>	<p>The calculation of the baseline emissions was found to be fully compliant with the above stated principles.</p> <p>It was found that a complete set of data covering the monitoring period has been provided by the PPs. Activity levels and non-activity parameters have been monitored in accordance with the monitoring plan, as applicable.</p> <p>The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied SB. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information has been identified.</p>	<input checked="" type="checkbox"/>	<p>The verification team has identified mistake(s) in the baseline emissions calculation or the underlying calculation approaches</p>	<input checked="" type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>CAR 1: The sum of the HNO₃ production values in the excel sheet "HNO₃ plausibility" is not correct.</p>
<input type="checkbox"/>	<p>The calculation of the baseline emissions was found to be fully compliant with the above stated principles.</p> <p>It was found that a complete set of data covering the monitoring period has been provided by the PPs. Activity levels and non-activity parameters have been monitored in accordance with the monitoring plan, as applicable.</p> <p>The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied SB. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information has been identified.</p>						
<input checked="" type="checkbox"/>	<p>The verification team has identified mistake(s) in the baseline emissions calculation or the underlying calculation approaches</p>						
<input checked="" type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>CAR 1: The sum of the HNO₃ production values in the excel sheet "HNO₃ plausibility" is not correct.</p>						
Conclusion	<table border="1"> <tr> <td data-bbox="472 1641 539 1731"><input type="checkbox"/></td><td data-bbox="539 1641 1396 1731"> <p>No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.</p> </td></tr> <tr> <td data-bbox="472 1731 539 1821"><input checked="" type="checkbox"/></td><td data-bbox="539 1731 1396 1821"> <p>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p> </td></tr> </table> <p>The baseline emissions calculation was prepared by the PPs and presented to the verification team. It can be confirmed that the baseline calculation is overall correct. It shall be noted that the raised finding didn't affect the amount of baseline emissions.</p>	<input type="checkbox"/>	<p>No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.</p>	<input checked="" type="checkbox"/>	<p>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p>		
<input type="checkbox"/>	<p>No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.</p>						
<input checked="" type="checkbox"/>	<p>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p>						

E.8.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	<p>During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> • <i>Transparency</i>: It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation spreadsheet provides all calculation formulae. • <i>Parameter consistency</i>: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the MR and the Excel calculation spreadsheet. Besides the information provided in MR and/or Excel spreadsheet has been crosschecked with other sources such as plant logbooks, inventories, lab analysis, invoices. • <i>Correctness</i>: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology. Further it has been checked whether any assumptions used have been justified. • <i>Completeness</i>: It has been checked whether all calculations are complete and without omissions as well as whether a complete set of data is available. <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/. 						
Findings	<p>The project GHG emissions achieved in this monitoring period have been found to be 102,429 tCO₂e.</p> <table border="1"> <tr> <td data-bbox="472 947 539 1406"><input type="checkbox"/></td><td data-bbox="539 947 1396 1406"> <p>The calculation of the project emissions was found to be fully compliant with the above stated principles.</p> <p>It was found that a complete set of data covering the monitoring period has been provided by the PPs. Activity levels and non-activity parameters have been monitored in accordance with the monitoring plan, as applicable.</p> <p>The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied SB. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p> </td></tr> <tr> <td data-bbox="472 1406 539 1473"><input checked="" type="checkbox"/></td><td data-bbox="539 1406 1396 1473"> <p>The verification team has identified mistake(s) in the project emissions calculation or the underlying calculation approaches.</p> </td></tr> <tr> <td data-bbox="472 1473 539 1568"></td><td data-bbox="539 1473 1396 1568"> <p>In this context the following CARs, CLs, FARs have been raised:</p> <p>CAR 2: "Natural Gas Calculation": The name of the parameter and the unit in excel sheet, cells G09 and G10 are not correct.</p> </td></tr> </table>	<input type="checkbox"/>	<p>The calculation of the project emissions was found to be fully compliant with the above stated principles.</p> <p>It was found that a complete set of data covering the monitoring period has been provided by the PPs. Activity levels and non-activity parameters have been monitored in accordance with the monitoring plan, as applicable.</p> <p>The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied SB. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>	<input checked="" type="checkbox"/>	<p>The verification team has identified mistake(s) in the project emissions calculation or the underlying calculation approaches.</p>		<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>CAR 2: "Natural Gas Calculation": The name of the parameter and the unit in excel sheet, cells G09 and G10 are not correct.</p>
<input type="checkbox"/>	<p>The calculation of the project emissions was found to be fully compliant with the above stated principles.</p> <p>It was found that a complete set of data covering the monitoring period has been provided by the PPs. Activity levels and non-activity parameters have been monitored in accordance with the monitoring plan, as applicable.</p> <p>The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied SB. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>						
<input checked="" type="checkbox"/>	<p>The verification team has identified mistake(s) in the project emissions calculation or the underlying calculation approaches.</p>						
	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>CAR 2: "Natural Gas Calculation": The name of the parameter and the unit in excel sheet, cells G09 and G10 are not correct.</p>						
Conclusion	<table border="1"> <tr> <td data-bbox="472 1579 539 1657"><input type="checkbox"/></td><td data-bbox="539 1579 1396 1657"> <p>No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.</p> </td></tr> <tr> <td data-bbox="472 1657 539 1758"><input checked="" type="checkbox"/></td><td data-bbox="539 1657 1396 1758"> <p>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p> </td></tr> </table> <p>Where corrections were required a revised calculation of project emissions was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the project emissions calculation is overall correct. It shall be noted that the raised finding didn't affect the amount of project emissions.</p>	<input type="checkbox"/>	<p>No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.</p>	<input checked="" type="checkbox"/>	<p>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p>		
<input type="checkbox"/>	<p>No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.</p>						
<input checked="" type="checkbox"/>	<p>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p>						

E.8.3. Calculation of leakage GHG emissions

Means of verification	<p>During the verification it has been checked whether leakage emissions have to be considered and, in cases where leakage emissions have to be calculated, the respective calculation of leakage GHG emissions has been checked. In such cases the same verification principles have been considered as for the baseline and project emissions calculation. Please refer to E.8.1 and E.8.2.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/. 	
Findings	<input checked="" type="checkbox"/>	No leakage emissions were to be considered (LE = 0).
	<input type="checkbox"/>	<p>The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see 8.1 and 8.2).</p> <p>The calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in leakage emissions calculations have been justified. Where applicable, appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>
	<input type="checkbox"/>	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	<input type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>- N/A</p>
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	No further comments.	

E.8.4. Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	<p>The verification team has checked, if the MR includes a summary table of the emission reductions calculation specifying separately</p> <ul style="list-style-type: none"> - Total baseline emissions, - Total project emissions, - Total leakage, - Total emission reductions. <p>It has been assessed whether the values are correct or need to be revised as a consequence of issues identified above.</p>	
Findings	<input checked="" type="checkbox"/>	Section E.4 of the MR includes a summary table of the emission reductions calculation. The GHG emission reductions achieved in this monitoring period have been found to be 1,198,544 tCO _{2e} .
	<input checked="" type="checkbox"/>	The summary table specifies the total baseline, project and leakage emissions as well as the total emission reductions separately.
	<input checked="" type="checkbox"/>	The values as specified in the ER summary table are correct; no issues have been identified during the verification which requires changes in the ER calculation.
	<input type="checkbox"/>	During the verification issues with impact on the ER calculation have been identified and thus the summary values needed to be changed. However, these issues have been addressed appropriately and PP has carried out the requested corrections.

	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: -
Conclusion	<input checked="" type="checkbox"/>	The verification team confirms that the project is in line with the respective requirements and that: <ul style="list-style-type: none"> - no data was missing due to activity levels or non-activity parameters, - all spreadsheets including corresponding re-calculations of data during events as described in the MR were made available by the PPs, and that all formulae have been correctly implemented and are accessible and traceable, - any recalculation is in line with the procedure in the registered PDD and has been checked and found to be correct and conservative, - appropriate methods and formulae for calculating GHG emissions have been followed, - no pro-rata approach is applicable, and - the first day in which CERs are being claimed has been correctly specified.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		No further comments.

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	The verification team has checked, if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD. It has further checked, which of the below listed cases is applicable for the calculated ER of the current monitoring period.	
Findings	<input type="checkbox"/>	Case 1: The ex-ante estimated value was found to be proportionally higher than the ex-post determined value. No further action is deemed required.
	<input checked="" type="checkbox"/>	Case 2: The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.
	<input type="checkbox"/>	Case 3: The ex-ante estimated value was found to be proportionally lower than the ex-post determined value.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: - N/A
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The actual monitored ER and the ex-ante value differ by less than 4 %.

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered PDD (E.8.5) the verification team has checked whether (in case 3) an appropriate explanation is included in the MR.	
Findings	<input checked="" type="checkbox"/>	No further justification or explanation is deemed required as actual emissions of this MP do not exceed significantly the ex-ante calculated emission reductions (applicable for case 1 and 2).
	<input type="checkbox"/>	For case 3: The PP has provided a related justification in the MR. The reasons for the increase are as follows:

		- N/A
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: - N/A
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The PPs have addressed the difference and the justifications provided where found to be reasonable and the underlying facts have been verified by the verification team.

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	The verification team has checked chapter E.7 of the MR and the emission reduction calculation sheet /XLS/.										
Findings	<input checked="" type="checkbox"/> The MR in section E.7 includes a summary table of the ER breakdown <div style="margin-left: 20px;"> <i>a) ER up to 31/12/2012 and</i> <i>b) ER from 01/01/2013 onwards</i> </div> <input checked="" type="checkbox"/> The breakdown of the ERs during the first commitment period and from 01/01/2013 onwards is as follows: <div style="margin-left: 20px;"> <input type="checkbox"/> The ER have completely been generated during the first commitment period <input checked="" type="checkbox"/> The ERs have completely been generated from 01/01/2013 onwards, <input type="checkbox"/> The ERs have partly been generated during the first commitment period and partly from 01/01/2013 onwards. </div> <input checked="" type="checkbox"/> The breakdown of the ERs is correct, considering the applicable guidance. <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th></th><th>until 31/12/2012 ¹⁾</th><th>from 01/01/2013 ¹⁾</th><th>Sum</th></tr> </thead> <tbody> <tr> <td>GHG emission reductions [tCO₂e] achieved in the monitoring period</td><td style="text-align: center;">-</td><td style="text-align: center;">1,198,544</td><td style="text-align: center;">1,198,544</td></tr> </tbody> </table> <div style="margin-left: 20px; margin-top: 5px;"> ¹⁾ This day is included. </div>				until 31/12/2012 ¹⁾	from 01/01/2013 ¹⁾	Sum	GHG emission reductions [tCO ₂ e] achieved in the monitoring period	-	1,198,544	1,198,544
	until 31/12/2012 ¹⁾	from 01/01/2013 ¹⁾	Sum								
GHG emission reductions [tCO ₂ e] achieved in the monitoring period	-	1,198,544	1,198,544								
Conclusion	<input checked="" type="checkbox"/> No CARs/CLs/FARs have been raised in this context. No correction was required. The verification team confirms that the project is in line with the respective requirements. <input type="checkbox"/> The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4. The data provided in the MR is correct as well as the related breakdown. The pro-rata approach was not required to be applied to the calculations of GHG emission reductions or net anthropogenic GHG removals in accordance with the project standard.										

E.9. Assessment of reported sustainable development co-benefits

Means of verification	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	<input type="checkbox"/>	<p>The project participants have monitored the sustainable development co-benefits of the registered CDM project activity, and requested the DOE to verify them.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /PDD/ • /DSD/ • /unfccc/.
Findings	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	<input type="checkbox"/>	<p>Therefore the DOE has assessed and confirms that:</p> <p>(a) The monitoring has been carried out in accordance with the document for monitoring sustainable development co-benefits, if such document was developed and published on the UNFCCC CDM website in accordance with the “CDM project standard for project activities”;</p> <p>(b) The reported monitoring results correspond to the sustainable development co-benefits of the project activity as observed by the DOE.</p>
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
		No further comments.

E.10. Global stakeholder consultation

Means of verification		<p>In accordance with the PCP the DOE has submitted the initial version of the monitoring report provided by the PP for this monitoring period to be published on the UNFCCC webpage.</p> <p>The monitoring report has been published on 21/01/2019</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /unfccc/.
Findings	<input checked="" type="checkbox"/>	No comments have been received within 14 days of the publication of the monitoring report for this monitoring period.
	<input type="checkbox"/>	Comments have been received and the DOE has concluded that comments are related to issues outside the CDM rules and requirements. Please refer to the list provided under Conclusion of this Section below for related information.
	<input type="checkbox"/>	<p>Comments have been received.</p> <p>The DOE has</p> <ul style="list-style-type: none"> - requested further information from the submitters of the comments - informed the project participants of the comments received, and requested their feedback within a specified timeframe, - considered the input received and has assessed whether such comments are relevant to the CDM project activity, - acknowledged receipt of all submitted comments on the MR of the proposed CDM project activity,

		<ul style="list-style-type: none"> - assessed whether the comments are related to the CDM rules and requirements (if so related findings have been raised as per below), - used all possible means to determine the authenticity of the name and contact details of the individual or organization on whose behalf the comments have been submitted, - contacted the secretariat to make them publicly available (if only addressed to the DOE), - determined whether authentic and relevant comments in the global stakeholder consultation were taken into due account in the PDD of the proposed CDM project activity. 		
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised, i.e. as the DOE concludes that the comments are related to the CDM rules and requirements: -		
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
	The comments and how they have been treated by the DOE are listed below:			
	No.	Original comment received	Feedback by the PP	Statement by DOE
	1	-	-	-
2	-	-	-	
3	-	-	-	
4	-	-	-	

SECTION F. Internal quality control

Before the submission of the final verification report a technical review of the whole verification procedure was carried out. The technical reviewers are competent GHG auditors being appointed for the scope this project falls under. The technical reviewers are 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 verification opinion and the topic specific assessments as prepared by the verification team leader may have been confirmed or revised. Furthermore reporting improvements might have been achieved.

After the successful technical review an overall (esp. procedural) assessment of the complete verification has been carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the submission for requesting for issuance is conducted.

SECTION G. Verification opinion

CARBON Climate Protection GmbH has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 33rd periodic verification (6th periodic verification of the 2nd crediting period) of the project:

*“Catalytic N₂O destruction project in the tail gas of the
Nitric Acid Plant of Abu Qir Fertilizer Co.”*

With regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to the introduction of a tertiary technology for N₂O reduction in the tail gas stream of the nitric acid production plant in Abu Qir.

This verification covers the period from 14/02/2018 to 10/01/2019 (including both days).

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated PDD,
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., ACM0019 version 02.0,
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated.
- the monitoring system is in place and functional. The project has generated GHG emission reductions,
- the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.
- The first day of this monitoring period is directly following the previous monitoring period.

TÜV NORD JI/CDM CP further confirms that the project has achieved ER in the above mentioned reporting period as follows:

GHG ER: 1,198,544 tCO₂e.

SECTION H. Certification statement

As a duly accredited DOE, TÜV NORD CERT confirms that the project

*“Catalytic N₂O destruction project in the tail gas of the
Nitric Acid Plant of Abu Qir Fertilizer Co.”*

registered under

UNFCCC-No.: 0490

has achieved emission reductions in accordance with all applicable requirements for registered CDM project activities that would not have occurred in the absence of the project activity during the current monitoring period

MP-No.: 33 (= MP6/CP.2)

from: 14/02/2018

to: 10/01/2019

(including both days) as follows:

GHG ER: 1,198,544 tCO₂e.

The DOE certifies that the emission reductions are based on verifiable evidence.

Freiburg, 04/04/2019

G. Kochaniewicz



Team leader

Appendix 1. Abbreviations

Abbreviations	Full texts
AOR	Ammonia Oxidation Reactor
AFC	Abu Qir Fertilizer Co.
AST	Annual Surveillance Test
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CER	Certified Emission Reduction
CDM	Clean Development Mechanism
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CL	Clarification Request
DAL	Data Aggregation Level
DVR/DVerR	Draft Verification Report
ER	Emission Reduction
esp.	Especially
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IM	Interview Memo
MP	Monitoring Plan // Monitoring Period
MR	Monitoring Report
N.A.	Not applicable
NA	Nitric Acid
ODL	Original Data Level
PA	Project Activity
PDD	Project Design Document
PP	Project Participant
PRC	Post Registration Change

QA/QC	Quality Assurance / Quality Control
SB	Standardized Baseline
UNFCCC	United Nations Framework Convention on Climate Change
VT	Verification Team
VVS	Validation and Verification Standard
XLS	Emission Reduction Calculation Spreadsheet

Appendix 2. Competence of team members and technical reviewers

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2022-02-08
VCS / ISO 14064-2	Senior Assessor	2022-02-08

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy Demand
14.1	Afforestation and Reforestation

173 - Rev. 8, Date: 2019-02-08

173_001-VA060-F20_2019-02-08_rev8.doc

001-VA060-F20 rev3 / 2012-10-25

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2019-07-01
J1	Senior Assessor Technical Reviewer	2019-07-01
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2019-07-01

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal Energy Generation
1.2	Renewables
4.1	Cement and lime production
4.2	Paper
5.1	Chemical Industry
5.2	Caprolactam, nitric and adipic acid
8.1	Mining/mineral production
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
11.1	Emissions of fluorinated gases
11.2	Refrigerant gas production
12.1	Chemical Industry
13.1	Solid waste and wastewater

003 - Rev. 10, Date: 2016-07-01

003_001-VA060-F20_2016-07-01_rev10.doc

001-VA060-F20 rev3 / 2012-10-25

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2017-07-27
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2017-07-27

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. 4, Date: 2015-01-05

163_001-VA060-F20_2015-01-05_rev4.doc

001-VA060-F20 rev3 / 2012-10-25

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

224_001-VA060-F20_2018-08-31_rev8.doc

001-VA060-F20 rev3 / 2012-10-25

Appendix 3. Documents reviewed or referenced

No	Author	Reference	Title	References to the document	Provider
1.	UNFCCC	/GOT/	Glossary “CDM terms” (version 09.1)	https://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf	Other
2.	UNFCCC	/KP/	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
3.	UNFCCC	/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
4.	UNFCCC	/PS/	CDM Project Standard (Version 2.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
5.	UNFCCC	/VVS/	CDM Validation and Verification Standard (Version 02.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
6.	UNFCCC	/SAMPLE/	“Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities” (Version 04.0) “Standard for Sampling and Surveys for CDM Project Activities and Programme Activities” (version 07.0)	https://cdm.unfccc.int/Reference/Guidclarif/index.html http://cdm.unfccc.int/Reference/Standards/index.html	Other
7.	UNFCCC	/TA/	<ul style="list-style-type: none"> Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion Version 2 Tool to determine the mass flow of a greenhouse gas in a gaseous stream Version 2.0.0 	https://cdm.unfccc.int/Reference/tools/index.html	Other
8.	UNFCCC	/MRT/	Monitoring Report Form (CDM-MR-FORM), Version 06.0	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
9.	UNFCCC	/PDD/	PDD for CDM project: “Catalytic N ₂ O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.” Version 4.2, dated 13/12/2017	http://cdm.unfccc.int/Projects/DB/TUEV-SUED1151930566.53/view	Other
10.	UNFCCC	/ACM19/	ACM0019 ver.02.0, “N ₂ O abatement from nitric acid production”	http://cdm.unfccc.int/methodologies/DB/MNMFNF10VUEOJACEIRX3EHYC9QXGDC	Other

11.	IPCC	/IPCC/	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book IPCC publications	www.ipcc-nggip.iges.or.jp	Other
12.	DOE	/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)	(internal)	Other
13.	SGS	/14001/	ISO 14001 Certificate of AFC	-	Other
14.	SGS	/9001/	ISO 9001 Certificate of AFC	-	Other
15.	PP	/MR/	Monitoring Report for CDM project: "Catalytic N ₂ O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co." Version 1, dated 18/01/2019 "Catalytic N ₂ O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co." Version 1.1 dated 22/02/2019	-	Other
16.	PP	/VAL/	Validation Report for CDM project "Catalytic N ₂ O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co." Revision No. 5, dated 02/12/2013	http://cdm.unfccc.int/Projects/D/B/TUEV-SUED1151930566.53/view	Other
17.	PP	/IL/	List of installed instruments and calibration status	-	Other
18.	Several authors	/CAL/	Calibration documents	-	Other
19.	PP	/DR/	Daily reports (in CSV and PDF format)	-	Other
20.	Emerson Process Management	/DV-CF/	Technical Information by Emerson regarding calibration frequency of the CDM project transmitters	-	Other
21.	Emerson Process Management	/DV-VC/	Technical Information by Emerson regarding version control of the CDM project transmitters	-	Other
22.	AFC	/GC/	Gas-chromatograph Tail gas analysis reports	-	Other
23.	KROHNE Messtechnik	/K-CF/	Technical Information by Krohne regarding calibration frequency of the variable area flowmeter	-	Other
24.	Several authors	/MCC/	Maintenance and Calibration Certificates	-	Other
25.	GASCO	/NGC/	Natural gas Certificates	-	Other
26.	TÜV Rheinland	/QAL1/	QAL 1 Certificate of the annubar probe	-	Other
27.	AIRTEC	/QAL2/	QAL 2 Report according to EN 14181 dt. 2014-08-14	-	Other
28.	PP	/QAL3/	Shewhart control cards / QAL 3 records	-	Other
29.	PP	/QMS/	Quality Management System Procedures	-	Other
30.	Several authors	/VER/	Documents of previous verifications (Monitoring reports,	http://cdm.unfccc.int/Projects/D/B/TUEV-	Other

			verification reports, ER calculation sheets)	SUED1151930566.53/view	
31	PP	/XLS/	Initial (version 1.0) and final Emission Reductions spread sheet (version 1.1)	-	Other
32	Airtec	/AST/	AST Report 2017, No: 17/65 according to EN 14181 AST Report 2018, No: 18/64 according to EN 14181	-	Other
33	PP	/DELTAV/	Data from Delta-V System	-	Other
34	TN	/IM/	Interview memo	-	Other

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

Table 1. Remaining FAR from validation and/or previous verification

FAR ID		Section no.		Date:	
Description of FAR					
-					
Project participant response (1st round)				Date:	DD/MM/YYYY
-					
Documentation provided by project participant (1st round)					
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:		
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:		
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:		
<input type="checkbox"/>	Other:				
DOE assessment (1st round)				Date:	DD/MM/YYYY
-					
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input type="checkbox"/> The finding is closed			

Table 2. CL from this verification

CL ID	1	Section no.	MR	Date:	20/02/2019
Description of CL					
Where reference is made to the ISO standards 9001 and 14001 the penultimate versions are mentioned in the MR (v. 01.0)					
Project participant response (1st round)				Date:	22/02/2019
The last ISO 9001 and 14001 standards version (2015) is updated and corrected in the revised MR (v. 01.1).					
Documentation provided by project participant (1st round)					
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:		
<input checked="" type="checkbox"/>	Changes in MR	Section(s):	New version No.: 1.1		
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:		
<input type="checkbox"/>	Other:				
DOE assessment (1st round)				Date:	22/02/2019
The version of ISO standard was updated. The corrections have been carried out correctly.					
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

CL ID	2	Section no.	C	Date:	20/02/2019
Description of CL					
In the MR (v. 01.0) under section C page 12 reference is made to UHDE GmbH. It should be checked whether this is still correct.					
Project participant response (1st round)				Date:	22/02/2019
In the revised MR (v. 01.1) the reference has been updated to TKIS (ThyssenKrupp Industrial Solutions AG) which is the current name of former UHDE GmbH. It shall be noted that the technology supplier UHDE changed its name to TKIS.					
Documentation provided by project participant (1st round)					

<input type="checkbox"/> Changes in the PDD	Section(s):	New version No.:
<input checked="" type="checkbox"/> Changes in MR	Section(s): C	New version No.: 1.1
<input type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:
<input type="checkbox"/> Other:		
DOE assessment (1st round)		Date: 22/02/2019
The name of technology provider was updated. The corrections have been carried out correctly.		
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed	

CL ID	3	Section no.	E.7	Date: 20/02/2019
Description of CL				
For newly installed nitric acid flowmeter the calibration validity period is considered to start at the date of installation. It should be demonstrated that manufacturer's recommendations regarding the calibration validity are not exceeded for instruments that were stored prior to installation.				
Project participant response (1st round)				Date: 22/02/2019
<p><i>Although the manufacturer recommends to perform the calibration every 5 years at least, PPs are performing the calibration of the respective transmitter / parameter every 2 years, which is in accordance with the monitoring plan and the registered PDD. The PPs have committed themselves to a shorter calibration frequency (2 years calibration / general maintenance (meter verification)) in order to enhance the measurement's reliability and sustainability.</i></p> <p><i>Accordingly, in the light of 2 years calibration / general maintenance frequency, which the PPs are following and which ensures the transmitter is calibrated in accordance with the monitoring plan and as per the manufacturer's specifications (= 5 years calibration frequency), and the PPs' guarantee that the transmitter is not stored more than 3 years of the date of the valid factory calibration, this makes the transmitter to be subject to a factory calibration / general maintenance in a period not exceeding 5 years of the date of the factory calibration.</i></p>				
Documentation provided by project participant (1st round)				
<input type="checkbox"/> Changes in the PDD	Section(s):	New version No.:		
<input type="checkbox"/> Changes in MR	Section(s):	New version No.:		
<input type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:		
<input type="checkbox"/> Other:				
DOE assessment (1st round)				Date: 22/02/2019
The explanation provided is deemed to be sufficient to clarify this issue.				
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

Table 3. CAR from this verification

CAR ID	1	Section no.	excel sheet	Date: 20/02/2019
Description of CAR				
ER calculation: The sum of the HNO ₃ production values in the sheet "HNO ₃ plausibility" is not correct.				
Project participant response (1st round)				
The sum of the HNO ₃ production value in the sheet "HNO ₃ plausibility" of the ER calculation sheet has been updated in the revised sheet (v. 01.1).				
Documentation provided by project participant (1st round)				Date: 22/02/2019
<input type="checkbox"/> Changes in the PDD	Section(s):	New version No.:		
<input type="checkbox"/> Changes in MR	Section(s):	New version No.:		
<input checked="" type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.: 1.1		
<input type="checkbox"/> Other:				
DOE assessment (1st round)				Date: 22/02/2019
The value in the sheet "HNO ₃ plausibility" has been revised. The corrections have been carried out correctly.				

Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed
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CAR ID	2	Section no.	excel sheet	Date:	20/02/2019
Description of CAR					
Natural Gas Calculation: The name of the parameter and the unit in cells G09 and G10 are not correct.					
Project participant response (1st round)					
The name of the parameter and the unit in cells G09 and G10 of the natural gas calculation sheet has been updated / corrected accordingly.					
Documentation provided by project participant (1st round)					Date:
<input type="checkbox"/> Changes in the PDD					Section(s): New version No.:
<input type="checkbox"/> Changes in MR					Section(s): New version No.:
<input type="checkbox"/> Changes in XLS					Worksheet(s): New version No.:
<input checked="" type="checkbox"/> Other: Natural gas calculation sheet					
DOE assessment (1st round)					Date:
The name of the parameter in the gas calculation sheet has been revised. The corrections have been carried out correctly.					
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

Table 4. FAR from this verification

FAR ID		Section No.		Date:	
Description of FAR					
-					
Project participant response					Date:
Documentation provided by project participant					
<input type="checkbox"/> Changes in the PDD					Section(s): New version No.:
<input type="checkbox"/> Changes in MR					Section(s): New version No.:
<input type="checkbox"/> Changes in XLS					Worksheet(s): New version No.:
<input type="checkbox"/> Other:					
DOE assessment					Date:
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> To be checked during the next periodic verification			

Appendix 5. Monitored Parameters

Table A-5: Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
P_{NA,n}		Nitric Acid Produced		
<p>a) Measurement / Determination method (VVS, §§ 360-364) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	<p>/PDD/ /ACM19/ /DELTAV/ /IM/ /XLS/</p>	<p><i>Description:</i></p> <p>As per registered PDD and in line with the related methodology, the production of Nitric acid is monitored by the installed equipment.</p> <p>An electromagnetic flow meter measures the flow and the thermocouple measures the temperature. The meters are located downstream of the absorption tower of the nitric acid line. The data is recorded automatically by the DCS system on an hourly basis. Further, the nitric acid density is measured 4 times a day in the AFC laboratory and the nitric acid concentration is determined based on density and temperature based on a procedure provided by the Nitric Acid Plant manufacturer (UHDE, Germany) and in line with the AFC ISO 9001 QMS. Finally, all the data is transferred to an excel sheet to calculate the HNO₃ (100%) production on an hourly basis.</p> <p>The data aggregation procedure applied by the PP is shown as follows:</p> <ol style="list-style-type: none"> 1. The DCS system records the value from the flow meter and temperature transmitter hourly (log sheet no. 409/1/2/3A/F5) and the concentration is recorded using the sheet 410/3/3/F1 and F-QC-01/4. By use of an excel sheet the HNO₃ production per hour is calculated (DAL-1=ODL). 2. Based on the hourly reports, the final value was reported in the MR (DAL0). 	CAR-1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		The daily data of HNO ₃ production and concentration are logged in sheet no. 409/1/2/3 F1 which used for cross-check.			
		<i>Verifier´s action:</i> It was verified by onsite interview and by a check of the hourly log sheets, calculation spreadsheet, against the “Procedures for CDM Project”, the MP and the applied methodology. Furthermore, the following actions have been taken by the verification team to check the correctness of the data aggregation: The reported value in the MR (DAL0) has been recalculated by the verification team based on the values from the hourly sheets (DAL-1). Based on the underlying original data (DAL-1=ODL), the verification team calculated the data aggregation completely independent from the calculation provided by the PP.			
		<i>Conclusion:</i> Based on on-site observation and document check, it can be confirmed that the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.			
		<input checked="" type="checkbox"/>	In this context the following findings have been raised:		
			CAR 1: XLS: The sum of the HNO ₃ production values in the sheet “HNO3 plausibility” is not correct.		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the</i>	/MR/ /DR/ /XLS/	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan (Final assessment)	OK	OK
		<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.	
<p><i>monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>		<input checked="" type="checkbox"/> No delayed calibration has occurred (Final assessment)			
		<input checked="" type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct.			
		<input checked="" type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		<input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY			
		<input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			<input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration
		<input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument			
		<input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument			
		<input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals			
<input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.					
<input type="checkbox"/> In this context the following findings have been raised:					

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.				
		<input type="checkbox"/>						
hy		Number of hours of operation in year y						
<p>a) Measurement / Determination method (VVS, §§ 360-364) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/PDD/ /ACM19/	<p><i>Description:</i></p> <p>As per registered PDD and in line with related methodology, the operation hours are monitored on the basis of the observed AOR temperatures.</p> <p>During times when the temperature of the two AOR ranges within the manufacturer's specification (i.e. from 850 to 910 °C), the AOR is considered to be in continuous operation. Hence, the operation hours are measured by monitoring the temperature.</p> <p>The data aggregation procedure applied by the PP is shown as follows:</p> <ol style="list-style-type: none"> 1. The temperature is measured and recorded automatically, the information is stored electronically on an hourly basis (DAL-1=ODL). 2. Based on the hourly records, the final value was reported in the MR (DAL0). <p><i>Verifier's action:</i></p> <p>It was verified by on-site interview and observations, checking the electronic records and paper work against the XLS.</p> <p><i>Conclusion:</i></p> <p>The value given in the MR is correct.</p> <table border="1"> <tr> <td><input type="checkbox"/></td> <td>In this context the following findings have been raised:</td> </tr> <tr> <td><input type="checkbox"/></td> <td>-</td> </tr> </table>	<input type="checkbox"/>	In this context the following findings have been raised:	<input type="checkbox"/>	-	OK	OK
<input type="checkbox"/>	In this context the following findings have been raised:							
<input type="checkbox"/>	-							

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/ACM19/ /MCC/ /IL/ /14001/ /9001/	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	OK	OK
		<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/>	No delayed calibration has occurred		
		<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.		
		<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed				

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<div>calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals</div> <div><input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</div> <div><input type="checkbox"/> In this context the following findings have been raised:</div> <div><input type="checkbox"/> -</div>		
h_{r,y}		For tertiary N₂O abatement, Number of hours (h) in year y where the abatement system is by-passed, underperforming or failed		
a) Measurement / Determination method (VVS, §§ 360-364) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/IM/ /PDD/ /MCC/ /IL/ /14001/ /9001/ /DELTAV/	Description: As per the registered PDD and in line with related methodology, h _{r,y} is number of hours (h) in year y where the tertiary N ₂ O abatement system is by-passed, underperforming or failing. When, as per ACM0019, the inequality below is true, the abatement system is deemed to be by-passed, not working or failed in the hour h. $F_{N2O,tailgas,h} > EF_{existing,y} \times P_{NA,h}$ The value is determined and monitored as explained in the respective sections of parameters of F _{N2O,tailgas,h} (see parameters V _{t,db,n} , V _{i,t,db} and C _{H2O,t,db,n}), EF _{existing,y} , and P _{NA,h} (P _{production,y}). Verifier's action: It was verified by on-site interview and observations, checking monitoring of parameter F _{N2O,tail gas,h} (see parameters of V _{t,db,n} , V _{i,t,db} and C _{H2O,t,db,n}), EF _{existing,y} , and P _{NA,h} (P _{production,y}) against the calculation of $F_{N2O,tailgas,h} > EF_{existing,y} \times P_{NA,h}$. Conclusion:	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		Based on onsite observation and document check, it can be confirmed that the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		
		<input type="checkbox"/> In this context the following findings have been raised:		
		<input type="checkbox"/> -		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/MCC/ /IL/ /14001/ /9001/ /DELTAV/ /MR/ /XLS/	<input checked="" type="checkbox"/> It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan <input checked="" type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6 <input checked="" type="checkbox"/> No delayed calibration has occurred <input checked="" type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct. <input checked="" type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period. <input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY <input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:	OK	OK
		<input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
			<input type="checkbox"/> scheduled date of calibration and the actual date of calibration <input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument <input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument <input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals <input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/> In this context the following findings have been raised: <input type="checkbox"/> N/A			
V_{t,db,n}		Volumetric flow of the gaseous stream in time interval t on a dry basis			
a) Measurement / Determination method (VVS, §§ 360-364) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.	/PDD/ /ACM19/ /DV-CF/ /DV-VC/ /QAL1/ /QAL2/ /AST/	Description: As per registered PDD and in line with related methodology, the volumetric flow of the gaseous stream in time interval t on a dry basis is monitored by an annubar probe. The instrument is located in the tail gas, downstream of the EnviNOx® reactor (21R004) (at stack of NA plant). The data is measured continuously, read secondly and recorded hourly. The data aggregation procedure applied by the PP is as follows: 1. The differential pressure is monitored continuously, converted to volume flow and recorded hourly through the automated data		OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p>logging system, Delta-V. (DAL-1=ODL).</p> <p>2. Based on the hourly reports, the final value was reported in the MR (DAL0).</p> <p>The annubar probe has undergone a QAL 2 test from 08/07/2014 to 10/07/2014 and annual ASTs since then. The identified calibration factors have been applied as part of the XLS ER calculation. However, as part of the EN 14181 compliance requirements an AST has to be carried out once a year. Within the current monitoring period AST has been undertaken on 20/04/2018. The penultimate AST has been carried out on 06/04/2017. Considering the fact that the purpose of the AST is to confirm the validity of the QAL2 results and the same could be confirmed during the 2018 test, no mark up for delayed calibration has been applied. This is considered to be in line with the monitoring plan requirements.</p>		
		<p><i>Verifier's action:</i></p> <p>The data aggregation and calculation was verified during on-site visit by means of data analysis, excel – walkthroughs and interview with the Carbon Climate Protection team using Delta-V trend curves (generated from raw data), Delta-V files and the QAL 2 report. Further a comparison with theoretical data has been checked.</p> <p>100% of the hourly records have been verified by means of data analysis tools. The data transfer from the Delta-V system has been checked on a sample basis.</p>		
		<p><i>Conclusion:</i></p> <p>Based on onsite observation and document check, it can be confirmed that the measurement / determination method currently installed is in line with the registered monitoring plan of the PDD and the applied methodology.</p>		
		<p><input type="checkbox"/> In this context the following findings have been raised:</p>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		<input type="checkbox"/>	-		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/CAL/ /MR/ /PDD/ /QAL1/ /QAL2/ /AST/	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	OK	OK
		<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/>	No delayed calibration has occurred		
		<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.		
		<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals <input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration. <input type="checkbox"/> In this context the following findings have been raised: <input type="checkbox"/> N/A		
V_{i,t,db}		Volumetric fraction of greenhouse gas i in a time interval t on a dry basis		
a) Measurement / Determination method (VVS, §§ 360-364) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/XLS/ /ACM19/ /PDD/ /MR/ /QAL1/ /QAL2/ /QAL3/ /AST/ /GC/	Description: As per registered PDD and in line with the applicable methodology, the volumetric fraction of the greenhouse gas <i>i</i> in a time interval <i>t</i> on a dry basis is monitored by the EnviNOx®-System NDIR analyzer supplied by Emerson. The sample take-off is located in the tail gas line, downstream of the EnviNOx® reactor (21R004) and leads (via sample gas line) to the analyzer house (located close to the EnviNOx® reactor), where analyzers and standard gases for calibrations are installed. The data is measured continuously, read secondly and recorded hourly. The data aggregation procedure applied by the PP is shown as follows: 1. The concentration of N ₂ O in the tail gas is continuously measured by non-dispersive infrared photometry (NDIR) analyzer, which is self-calibrated, using a set of certified gases. The N ₂ O concentration is measured in ppmv and automatically converted to tN ₂ O/Nm ³ and Nm ³ N ₂ O / Nm ³ dry gas recorded through the automated data logging system, DeltaV, and hourly reports are generated including	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.				
		<p>the values in ppm and mgN₂O/Nm³ (DAL-1=ODL).</p> <p>2. Based on the hourly reports, the final value was reported in the MR (DAL0).</p> <p>As per EN 14181 the AST is mandatory for the measurement of the N₂O outlet concentration (v_{i,t,db}). During the current MP the AST has been undertaken on 20/04/2018.</p> <p>The penultimate AST has been carried out on 06/04/2017. Considering the fact that the purpose of the AST is to confirm the validity of the QAL2 results and the same could be confirmed during the 2018 test, no mark up for delayed calibration has been applied. This is considered to be in line with the monitoring plan requirements.</p>						
		<p><i>Verifier's action:</i></p> <p>The N₂O concentration values were verified during on-site visit, by means of data comparison tests, interviews and observations. The Delta-V hourly reports, Delta-V trend curves the XLS as well as QA/QC documentation has been checked. Further also the results of the periodic Gas Chromatography measurements have been analyzed and compared with the NDIR measurement results.</p> <p>100% of the hourly records have been evaluated during the verification, whereas the data transfer from the Delta-V system has only been checked on a sample basis.</p>						
		<p><i>Conclusion:</i></p> <p>It can be confirmed that the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>						
		<table><tr><td><input type="checkbox"/></td><td>In this context the following findings have been raised:</td></tr><tr><td><input type="checkbox"/></td><td>-</td></tr></table>	<input type="checkbox"/>	In this context the following findings have been raised:	<input type="checkbox"/>	-		
<input type="checkbox"/>	In this context the following findings have been raised:							
<input type="checkbox"/>	-							

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/CAL/ /MR/ /XLS/ /QAL1/ /QAL2/ /QAL3/ /AST/ /GC/	<input checked="" type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	OK	OK
		<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/>	No delayed calibration has occurred		
		<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.		
		<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed				

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		<input type="checkbox"/>	calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/>	In this context the following findings have been raised:		
		<input type="checkbox"/>	N/A		
		<input type="checkbox"/>			
C_{H2O,t,db,n}		Moisture content of the gaseous stream at normal conditions in the time interval t			
a) Measurement / Determination method (VVS, §§ 360-364) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/PDD/ /CAL/ /MR/ /XLS/ /AST/	Description: As per registered PDD and in line with related methodology, the moisture content of the gaseous stream at normal conditions is measured according to the USEPA CF42 method 4 – Gravimetric determination of water content. 3 measurements have been carried out on 20/04/2018 in the course of the AST test. It was determined that the moisture content is well below the threshold value as per the “Tool to determine the mass flow of a GHG in a gaseous stream” of 0.05 kgH ₂ O/m ³ dry gas and thus the gas can be considered as dry (for the purpose of mass flow calculations in line with the above mentioned tool). Verifier’s action: The AST report has been checked and the referenced value could be confirmed based on check with related tool. Conclusion: Based on onsite observation and document check, it can be confirmed that the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied		OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		methodology and the value considered is deemed correct so that the gas can be considered as dry.		
		<input type="checkbox"/> In this context the following findings have been raised:		
		<input type="checkbox"/> -		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/CAL/ /ACM19/ /MR/ /AST/	<input checked="" type="checkbox"/> It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan <input checked="" type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6 <input checked="" type="checkbox"/> No delayed calibration has occurred <input checked="" type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct. <input checked="" type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period. <input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY <input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:	OK	OK
		<input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
		<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/>	In this context the following findings have been raised:		
		<input type="checkbox"/>	-		
FC_{i,j,y}		Quantity of fuel type i combusted in process j during the monitoring period n			
a) Measurement / Determination method (VVS, §§ 360-364) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/PDD/ /ACM19/ /DV-CF/ /DV-VC/ /NGC/ /XLS/	Description: Natural gas is used as a reducing agent in the EnviNOX® system (21R004). As per registered PDD and in line with related methodological tool, the quantity of the fuel combusted in process is monitored by a standard natural gas flow meter. Pressure and temperature transmitter are installed for the conversion to standard conditions. The meters are located in the natural gas line, upstream of the EnviNOX® reactor. The data is measured continuously, read secondly and recorded hourly. The data aggregation procedure applied by the PP is shown as follows:		OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		1. The natural gas input is measured in Nm ³ and recorded through the automated data logging system, DeltaV, and hourly reports are generated including the values in Nm ³ and tCH ₄ . (DAL-1=ODL).		
		2. Based on the hourly reports, the final value was reported in the MR (DAL0).		
		Verifier's action: It was verified during on-site visit by means of visual inspection, interviews and data analysis that the measurement system as described in the PDD is in place and correctly working. In detail values from the automated data logging system, DeltaV, have been checked on an hourly basis.		
		Conclusion: Based on onsite observation and document check, it can be confirmed that the measurement is in line with the registered monitoring plan of the PDD and the applied methodology.		
		<div><div><input type="checkbox"/></div><div>In this context the following findings have been raised:</div></div> <div><div><input type="checkbox"/></div><div></div></div>		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i>	/14001/ /9001/ /MCC/ /K-CF/ /DV-CF/	<input checked="" type="checkbox"/> It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	OK	OK
		<input checked="" type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/> No delayed calibration has occurred		
		<input checked="" type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct.		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)		Draft Concl.	Final Concl.
<p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>		<input checked="" type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/>	In this context the following findings have been raised:		
		<input type="checkbox"/>	-		
WC _{i,y}		Weighted average mass fraction of carbon in fuel type i in year y			

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
a) Measurement / Determination method (VVS, §§ 360-364) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/PDD/ /ACM19/ /NGC/	Description: As per registered PDD and in line with related methodology, the weighted average mass fraction of carbon in the natural gas is derived from the certificate of hydrocarbon supplier. The certificate is supplied by the hydrocarbon supplier at least once per year. The mass fraction of carbon is calculated based on the analysis as shown in the certificate	CAR 2	OK
		Verifier's action: During on-site visit the certificates and the calculation have been checked. Further the calculation has been reproduced and found to be fully correct.		
		Conclusion: Based on onsite observation and document check, it can be confirmed that the analysis of the natural gas used is appropriate and correct. The calculation method for the weighted average is deemed to be correct.		
		<input checked="" type="checkbox"/> In this context the following findings have been raised: CAR 2: ER calculation: "Natural Gas Calculation": The name of the parameter and the unit in cells G09 and G10 are not correct.		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371) In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions	/MR/ /ACM19/ /MCC/ /GC/	<input checked="" type="checkbox"/> It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	OK	OK
		<input checked="" type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/> No delayed calibration has occurred		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>		<input checked="" type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct.		
		<input checked="" type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.		
		<input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY		
		<input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
		<input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/> In this context the following findings have been raised: <input type="checkbox"/> -		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
P_{i,y}		Weighted average density of fuel type i in year y a dry basis		
a) Measurement / Determination method (VVS, §§ 360-364) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/PDD/ /ACM19/ /NGC/ /XLS/	Description: As per registered PDD and in line with related methodology, the weighted average density of the natural gas is derived from the analysis certificate of the hydrocarbon supplier. The certificate is supplied usually on a monthly basis, but at least once per year. The average density for a specific month has been calculated and a conservative value has been used.	OK	OK
		Verifier's action: The analysis certificates have been checked and the calculation has been reproduced.		
		Conclusion: The value used for the ER calculation has been fully derived as described in the MP.		
		<input type="checkbox"/> In this context the following findings have been raised: <input type="checkbox"/> -		
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371) In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.	/MR/ /MCC/	<input checked="" type="checkbox"/> It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	OK	OK
		<input checked="" type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6		
		<input checked="" type="checkbox"/> No delayed calibration has occurred		
		<input checked="" type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct.		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.										
<p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>		<input checked="" type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.												
		<input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: DD/MM/YYYY End date of delay: DD/MM/YYYY												
		<input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the: <table border="1" data-bbox="1144 699 1895 1230"> <tr> <td data-bbox="1144 699 1223 818"><input type="checkbox"/></td> <td data-bbox="1223 699 1895 818">The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration</td> </tr> <tr> <td data-bbox="1144 818 1223 914"><input type="checkbox"/></td> <td data-bbox="1223 818 1895 914">The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument</td> </tr> <tr> <td data-bbox="1144 914 1223 1010"><input type="checkbox"/></td> <td data-bbox="1223 914 1895 1010">The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument</td> </tr> <tr> <td data-bbox="1144 1010 1223 1137"><input type="checkbox"/></td> <td data-bbox="1223 1010 1895 1137">The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals</td> </tr> <tr> <td data-bbox="1144 1137 1223 1230"><input type="checkbox"/></td> <td data-bbox="1223 1137 1895 1230">The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</td> </tr> </table>			<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration	<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument	<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument	<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals	<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.
		<input type="checkbox"/>			The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration									
		<input type="checkbox"/>			The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument									
		<input type="checkbox"/>			The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument									
		<input type="checkbox"/>			The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals									
<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.													
<input type="checkbox"/> In this context the following findings have been raised:														

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
			<input type="checkbox"/>	-		

Appendix 6. Calibration dates and validity of installed monitoring equipment

Table A-6: Periodic Verification Checklist – Calibration details

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Installation date	Calibration date(s) ^{*)}	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration ^{**)}
FT21411	P _{production,y}	0252528	Magnetic flow meter	±0.25%	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2017-01-11	2019-01-10	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
“	“	14696594	“	±0.25%	<input type="checkbox"/> Before MP <input checked="" type="checkbox"/> 2018-04-02	2017-05-25	2020-04-01	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
TE21042	P _{production,y}	09846352	Temperature transmitter	±0.15°C	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
“	“	2405965	“	±0.15°C	<input type="checkbox"/> Before MP <input checked="" type="checkbox"/> 2018-04- 04	2018-04-04	2020-04-03	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
TE21014	h _y	2304376	Temperature transmitter	±0.7°C	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
“	“	0456506	“	±0.7°C	<input type="checkbox"/> Before MP <input checked="" type="checkbox"/> 2018-04- 04	2017-04-27 2018-11-27	2020-11-26	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
TE21015	h _y	2304377	Temperature transmitter	±0.7°C	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
“	“	0456503	“	±0.7°C	<input type="checkbox"/> Before MP <input checked="" type="checkbox"/> 2018-04- 04	2017-04-27 2018-11-27	2020-11-26	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
TE21020	h _y	2304378	Temperature transmitter	±0.7°C	<input checked="" type="checkbox"/> Before MP	2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No	From:

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Installation date	Calibration date(s) ¹⁾	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration ²⁾
					<input type="checkbox"/> 201_ _ _ _			<input type="checkbox"/> Yes	To:
"	"	0456505	"	±0.7°C	<input type="checkbox"/> Before MP <input checked="" type="checkbox"/> 2018-04- 04	2017-04-27 2018-11-27	2020-11-26	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
TE21021	h _y	2304379	Temperature transmitter	±0.7°C	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
"	"	0456508	"	±0.7°C	<input type="checkbox"/> Before MP <input checked="" type="checkbox"/> 2018-04- 04	2017-04-27 2018-11-27	2020-11-26	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
FT-21492	V _{t,db,n}	QAL2	Complete measuring system	3.84 % (as per QAL 2)	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2014-07-10	2019-07-09	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
"	"	AST	Complete measuring system	3.84 % (as per QAL 2)	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2017-04-06 2018-04-20	2019-04-19	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes ***)	From: 2018-04-06 To: 2018-04-19
"	"	13069588	Probe	1.89 % (as per QAL 1)	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2017-04-06 2018-04-20	2019-04-19	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes ***)	From: 2018-04-06 To: 2018-04-19
"	"	N1-D621-91220995	Differential pressure transmitter	1.89 % (as per QAL 1)	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2018-01-17 2018-02-15 2018-03-14 2018-04-04 2018-05-02 2018-05-30 2018-06-27 2018-07-25 2018-08-15 2018-09-12 2018-10-10 2018-11-07 2018-11-28 2018-12-26	2019-01-25	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Installation date	Calibration date(s) ^{*)}	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration ^{**)}
AT218002	V _{i,t,db}	QAL2	Complete measuring system	2.1 % (as per QAL 2)	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2014-07-10	2019-07-09	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
“	“	AST	Complete measuring system	2.1 % (as per QAL 2)	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2017-04-06 2018-04-20	2019-04-19	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes ^{***)}	From: 2018-04-06 To: 2018-04-19
“	“	990561462895	NDIR Analyser	±1%	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	Automatically Zero calibration daily Span calibration every other day	Done on daily basis	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
FT218002	FC _{i,j,y}	011008523.001	Natural gas flow meter	±1.6%	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
“	“	D170000000726740	“	±1.6%	<input type="checkbox"/> Before MP <input checked="" type="checkbox"/> 2018-04- 04	2017-04-25 2018-11-27	2020-11-26	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
TT218004	FC _{i,j,y}	2420017	Temperature transmitter	±0.1%	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2016-11-16 2018-04-04	2020-04-03	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
PT218004	FC _{i,j,y}	8657991	Pressure transmitter	±0.075%	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _ _ _	2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
“	“	0269746	“	±0.075%	<input type="checkbox"/> Before MP <input checked="" type="checkbox"/> 2018-04- 04	2017/05/04 2018-11-27	2020-11-26	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:

*) All calibrations during the monitoring period plus the last calibration prior the start of the MP.

**) for further details please refer to section E.7 of this report.

***) As the purpose of the AST is to confirm the validity of the QAL2 and the 2018 AST has confirmed the same, no mark up for delayed AST has been applied for the current ER calculation.

Monitoring Equipment	Related monitoring agent	Gas cylinder Serial Number	Certificate Number	Accuracy or accuracy class	Installation date	Date of Manufacture	Validity (last date)	Delay yes/no	Period of delay
Reference gas	N2O reference gas	105560/1208769	APEX12087763	1%	<input checked="" type="checkbox"/> Before MP <input type="checkbox"/> 201_ _	2017-03-25	2020-03-09	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
“	“	105560/1208764	N/A	1%	<input type="checkbox"/> Before MP <input checked="" type="checkbox"/> 2018-12-30	2017-03-25	2020-03-09	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.

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