




Verification and certification report form for CDM project activities

(Version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the verification and certification report form for CDM project activities" at the end of this form.

VERIFICATION AND CERTIFICATION REPORT

Title of the project activity	Catalytic N ₂ O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.
Reference number of the project activity	UNFCCC ID: 0490
Version number of the verification and certification report	2.1
Completion date of the verification and certification report	22/12/2017
Monitoring period number and duration of this monitoring period	Monitoring period 30 (Monitoring period 3 rd of 2 nd crediting period) Duration: 19/04/2015 – 10/01/2017
Version number of monitoring report to which this report applies	1.2
Crediting period of the project activity corresponding to this monitoring period	15/09/2013 – 14/09/2020 (including both days)
Project participant(s)	Carbon Egypt Ltd.; Kommunalkredit Public Consulting GmbH (withdrawn as of 04/11/2016); Energie AG Oberösterreich (withdrawn as of 04/11/2016); RWE Power AG; CARBON Climate Protection GmbH
Host Party	Arab Republic of Egypt
Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)	Scope: 5 / Technical Area: 5.2 CDM Methodology: ACM0019 Version 2 ("N ₂ O abatement from nitric acid production") No standardized baseline(s) applicable
Estimated GHG emission reductions or net anthropogenic GHG removals for this monitoring period in the registered PDD	2,217,883t CO _{2e}
Certified GHG emission reductions or	2,022,416 t CO _{2e}

net anthropogenic GHG removals for this monitoring period	
Name of DOE	TÜV NORD CERT GmbH
Name, position and signature of the approver of the verification and certification report	 Stefan Winter; Final Approver

SECTION A. Executive summary

CARBON Climate Protection GmbH has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 30th periodic verification (which is the 3rd 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 19/04/2015 to 10/01/2017 (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. S.A.E 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 and revised PDD.
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., ACM0019 ver. 2.
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately (except for the delay in the calibration of meters AT-218002 and FT-21492).
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 30th 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: 2,022,416 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 review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader / Technical expert	IR	Winter	Rainer	TÜV NORD CERT	x	x	x	x
2.	Team Member	EI	Kochaniewicz	Grzegorz	-	x	x	x	x
3.	Team Member	EI	Marei	Ramy	TÜV NORD Egypt	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.	Approver	IR	Winter	Stefan	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 might lead to wrong results	Check of monitoring equipment, esp. with regards to appropriateness of the location
2.	Dysfunction of installed	Medium	Dysfunction of	Check of operational data

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

	<i>equipment</i>		<i>equipment might lead to wrong measuring results</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"> - calibration intervals - calibration certificates - QAL 2 report - QAL 3 records - Qualification records of involved entities and personnel
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"> - Data aggregation trails - IT systems - Spreadsheet programming - Data protection measures - responsibilities
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.

<i>Parameter</i>	<i>Approach⁺</i>	<i>Errors* detected</i>	<i>Findings reference</i>	<i>Correc- ted</i>	<i>Remaining verification risk</i>
$P_{production,y}$	CDC	<input type="checkbox"/>	-	<input type="checkbox"/>	-
h_y	CDC	<input checked="" type="checkbox"/>	CL E.6.1	<input checked="" type="checkbox"/>	Not material
$V_{t,db,n}$	COM	<input checked="" type="checkbox"/>	CAR E.7.1, CAR E.8.1,	<input checked="" type="checkbox"/>	Not material
$V_{i,t,db}$	COM	<input checked="" type="checkbox"/>	CL E.6.1, CAR E.7.1, CAR E.8.1,	<input checked="" type="checkbox"/>	Not material
$FC_{i,j,y}$	COM	<input type="checkbox"/>	-	<input type="checkbox"/>	-
$\rho_{i,y}$	CDC	<input checked="" type="checkbox"/>	CL E.8.3	<input checked="" type="checkbox"/>	Not material
$w_{C,i,y}$	CDC	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	Not material
$CH_2O_{t,db,n}$	CDC	<input checked="" type="checkbox"/>	CAR E.5.2	<input checked="" type="checkbox"/>	Not material
$h_{r,y}$	CDC	<input checked="" type="checkbox"/>	-	<input checked="" type="checkbox"/>	Not material
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 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, version 9.0 the desk review involved the following tasks:

- (i) A review of the data and information presented to verify their completeness;
- (ii) 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;
- (iii) 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 9.0 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: 03/05/2017 to 04/05/2017				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening meeting	AFC	03/05/2017	R. Winter G. Kochaniewicz
2.	Check of changes with regards to operational and organisational changes	AFC	03/05/2017	3. R. Winter 4. G. Kochaniewicz 5. R. Marei
3.	Check of production site - Main equipment (with focus on changes) - Installed monitoring equipment - Analyzer cabinet - Laboratory	AFC	03/05/2017	R. Winter G. Kochaniewicz
4.	Check of calibration records	AFC	03/05/2017	R. Winter G. Kochaniewicz
5.	Check of QAL 2 and QAL 3 records	AFC	04/05/2017	R. Winter G. Kochaniewicz
6.	Data check including complete data aggregation, calculations and assumptions	AFC	04/05/2017	R. Winter G. Kochaniewicz
7.	Closing meeting	AFC	04/05/2017	1. R. Winter 2. G. Kochaniewicz 3. R. Marei

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	03/05/2017 (TelCon)	MR and ER calculation	R. Winter, G. Kochaniewicz
2.	Dunkel-Schwarzenberger	Gerald	CARBON Climate Protection GmbH	03-04/05/2017	General aspects	R. Winter, G. Kochaniewicz
3.	El Adawy	Mohamed	AFC	03-04/05/2017	Plant operation, Monitoring equipment	R. Winter, G. Kochaniewicz
4.	Bader	Montasser	AFC	03-04/05/2017	Plant operation, Monitoring equipment	R. Winter, G. Kochaniewicz
5.	Ashour	Fatehy	CARBON Climate Protection GmbH	03-04/05/2017	Plant operation, maintenance and calibration of equipment	R. Winter, G. Kochaniewicz
6.	Roshdy	Mahmoud	CARBON Climate Protection GmbH	03-04/05/2017	Plant operation, maintenance and calibration of equipment	R. Winter, G. Kochaniewicz R. Marei

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	633 days	6 days
$V_{i,t,db}$	OS	COM	633 days	6 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

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 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 the original data of one day have been checked in detail. No miscalculations or any other data transfer problems have been observed.

D.5. Clarification requests, corrective action requests and forward action requests 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	2	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)	0	1	0
Assessment of data and calculation of emission reductions or net removals (E.8)	4	1	0
Others (please specify)	2	0	0
Total	6	4	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	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
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	<p>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 05.1) as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.
	<input checked="" 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 type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: - 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 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 verification

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.

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 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. Furthermore, special events such as nitric acid 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 and 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. During the verification of the current MP no need for PRC has been identified. The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /MR/ • /VVS/ • /XLS/ • /QMS/ • /MTR/ • /unfccc/ 																
Findings	<table border="1"> <tr> <td data-bbox="416 1234 496 1323"><input checked="" type="checkbox"/></td><td data-bbox="496 1234 1412 1323">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.</td></tr> <tr> <td data-bbox="416 1323 496 1451"><input type="checkbox"/></td><td data-bbox="496 1323 1412 1451">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</td></tr> <tr> <td data-bbox="416 1451 496 1518"><input checked="" type="checkbox"/></td><td data-bbox="496 1451 1412 1518">In this context the following CARs, CLs have been raised: CL E.3.1</td></tr> <tr> <td colspan="2" data-bbox="416 1518 1412 1552"><i>In case of phased implementation:</i></td></tr> <tr> <td data-bbox="416 1552 496 1585"><input checked="" type="checkbox"/></td><td data-bbox="496 1552 1412 1585">N/A</td></tr> <tr> <td data-bbox="416 1585 496 1641"><input type="checkbox"/></td><td data-bbox="496 1585 1412 1641">The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.</td></tr> <tr> <td data-bbox="416 1641 496 1742"><input type="checkbox"/></td><td data-bbox="496 1641 1412 1742">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.</td></tr> <tr> <td data-bbox="416 1742 496 1832"><input type="checkbox"/></td><td data-bbox="496 1742 1412 1832">The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A</td></tr> </table>	<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 checked="" type="checkbox"/>	In this context the following CARs, CLs have been raised: CL E.3.1	<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
<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 checked="" type="checkbox"/>	In this context the following CARs, CLs have been raised: CL E.3.1																
<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	<table border="1"> <tr> <td data-bbox="416 1832 496 1921"><input checked="" type="checkbox"/></td><td data-bbox="496 1832 1412 1921">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.</td></tr> <tr> <td data-bbox="416 1921 496 2022"><input type="checkbox"/></td><td data-bbox="496 1921 1412 2022">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.</td></tr> <tr> <td colspan="2" data-bbox="416 2022 1412 2045">The project is fully implemented and has been in operation since October 2006.</td></tr> </table>	<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.											
<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. The referencing of ISO 14001: 2004 and ISO 14001:2009 was clarified.
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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 latest registered PDD and the applied methodology.
- ☒ During this monitoring period 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, monitoring methodology or standardized baseline

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.		
<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:	-

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 type="checkbox"/>	During the verification of the current MP no need for corrections has been identified.	
<input checked="" type="checkbox"/>	The following corrections have been applied:	
1	Issue:	The "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" requires that the measurement of the parameter $C_{H_2O,t,db,n}$ should coincide with the AST, however the PDD (ver. 4.1) requires that this parameter should only be measured as part of the first AST.
2	Issue:	-
<p>The PDD has been revised to reflect the requirement of the tool. It is to be noted that the parameter $C_{H_2O,t,db,n}$ has been measured during every AST. As this as always the understanding and practice, the same is considered as a correction to the MP.</p> <p>(New PDD) version No.: 4.2</p> <p>Revision date: 13/12/2017</p>		
<p>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.</p>		
<p><input type="checkbox"/> A related PRC has been submitted prior to the issuance request. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.</p> <p><input checked="" 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.</p>		

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

<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 to a registered project activity

<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, monitoring methodology or standardized baseline

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	<table border="1"> <tr> <td>Title</td> <td>-</td> </tr> <tr> <td>Status</td> <td><input type="checkbox"/> under approval; <input type="checkbox"/> approved</td> </tr> <tr> <td>Appr.date</td> <td></td> </tr> <tr> <td>Ref. No.</td> <td></td> </tr> </table>	Title	-	Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved	Appr.date		Ref. No.	
Title	-									
Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved									
Appr.date										
Ref. No.										
	2	<table border="1"> <tr> <td>Title</td> <td></td> </tr> <tr> <td>Status</td> <td><input type="checkbox"/> under approval; <input type="checkbox"/> approved</td> </tr> <tr> <td>Appr.date</td> <td></td> </tr> <tr> <td>Ref.No.</td> <td></td> </tr> </table>	Title		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved	Appr.date		Ref.No.	
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: <table border="1"><tr><td></td></tr></table>								
	2	Issue: <table border="1"><tr><td></td></tr></table>								
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:									
	1	Issue: <table border="1"><tr><td></td></tr></table>								
	2	Issue: <table border="1"><tr><td></td></tr></table>								

E.4.6. Changes to the project design of a registered project activity

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
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<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 monitoring plan with the monitoring methodology including applicable tool and standardized baseline

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/ • /METH/ • /TOOL/ • /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	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	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 type="checkbox"/> full compliance <input checked="" 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	Title (of the SB)	N/A
		Version		
		MP compliance		
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: - CAR E.5.1: The MR refers to "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 03.0.0), however as per registered PDD, the ex-ante parameters are already fixed for the entire crediting period following "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0). - CAR E.5.2: The "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" requires that the measurement of the parameter $C_{H_2O,t,db,n}$ should coincide with the AST, however the PDD (ver. 4.1) requires that this parameter should only be measured as part of the first AST.		
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.		
	The MR now references to the valid tools-versions at the time of RfRCP. Further a PRC incl. an updated PDD have been prepared.			

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	<p>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 values of these parameters as listed in chapter B.6.2 of the PDD are:</p> <ul style="list-style-type: none"> Operating pressure of the ammonia burner: 383 kPa Historical baseline emission factor of the nitric acid plant ($EF_{\text{historical}}$): 7.23 kg N_2O/t HNO_3 Default emission factor according to the operating pressure of the ammonia burner in year y (related to 100 per cent pure acid) ($EF_{\text{default},y}$) for 2015: 8.0; 2016: 7.8 and 2017: 7.6 kg N_2O/t HNO_3 Baseline N_2O emission factor for nitric acid production in year y (related to 100 per cent pure acid) ($EF_{\text{new},y}$) for 2015: 3.40; 2016: 3.20 and 2017: 3.00 kg N_2O/t HNO_3 Design capacity of nitric acid production during the first crediting period ($P_{\text{product,max}}$): 700,800 t HNO_3/a Global warming potential of N_2O valid for the commitment period (GWP_{N_2O}): 298 Universal ideal gases constant (R_u): 8,314 Pa m^3/kmol K Molecular mass of greenhouse gas I (MM_i): 44.02 kg/kmol (N_2O) Total pressure at normal conditions (P_n): 101,325 Pa Temperature at normal conditions (T_n): 273.15 K <p>Further it has been checked whether the GWP_{N_2O} for the respective period has</p>
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	<p>been correctly applied.</p> <p>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.
	<p>Based on check of MR, ER calculation and registered PDD it is confirmed that the values have been applied correctly and consistent.</p>

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 type="checkbox"/> Based on the details listed in appendix 5 the verification team can confirm that all parameter 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:
	<input checked="" type="checkbox"/> In this context the following CARs, CLs, FARs have been raised: CL E.6.1; CL E.8.1
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.
	<p>After closing all raised findings 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 been 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.			

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.</p> <p>The results as well as the verification procedures are described equipment-wise in the project specific verification checklist (Appendix 6).</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/ • /CAL/.
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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 deviations from calibration frequency requirements have been identified in the course of this verification: The MR is unclear pertaining to application of measures of delayed calibration of meters AT-218002 and FT-21492 (refer para 395 a and 396 a of VVS version 09)
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CAR E.7.1; CAR E.8.1;
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.
		The raised findings were correctly addressed and closed. 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, 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 baseline emissions are in accordance with the monitoring plan and the approved methodology. Further 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/ /ACM19/ /PDD/ /CAL/ /DR/ /DV-CF/ /IL/ /K-CF/
Findings	The baseline GHG emissions achieved in this monitoring period have been found to be 2,303,086 tCO _{2e} .
	<input checked="" type="checkbox"/> The calculation of the baseline emissions was found to be fully compliant

		<p>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 type="checkbox"/>	The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.
	<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 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.

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 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"> • /PDD/ • /MR/ • /ACM19/ • /XLS/ • /CAL/ • /DR/ • /DV-CF/ • /IL/ • /K-CF/
Findings	The project GHG emissions achieved in this monitoring period have been found to

	be 280,669 tCO _{2e} .	
	<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"/>	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CAR E.8.1
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.
	<p>The expanded uncertainty determined during latest QAL2 was applied to parameters $V_{t,db,n}$ and $v_{i,t,db}$ during the period of delayed calibration of relevant measurement instruments. The certificates for the natural gas from the hydrocarbon supplier were provided. The raised issues were addressed appropriately so that it can be confirmed that the project emissions calculation is overall correct.</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/ • /PDD/ • /ACM19/ 	
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 2,022,416 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 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 checked="" 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: - N/A
Conclusion	<input checked="" 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 and that:</p> <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.
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	It has further checked, which of the below listed cases is applicable for the calculated ER of the current monitoring period.	
Findings	<input checked="" 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 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 are lower than the ex-ante estimation. Therefore no further justification is required.	

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.
	Despite the above, 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 a) ER up to 31/12/2012 and b) ER from 01/01/2013 onwards
	<input checked="" type="checkbox"/>	The breakdown of the ERs during the first commitment period and from 01/01/2013 onwards is as follows:
	<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.									
	<input checked="" type="checkbox"/> The breakdown of the ERs is correct, considering the applicable guidance.									
	<table border="1"> <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 [tCO_{2e}] achieved in the monitoring period</td> <td>-</td> <td>2,022,416</td> <td>2,022,416</td> </tr> </tbody> </table> <p>¹⁾ This day is included.</p>				until 31/12/2012 ¹⁾	from 01/01/2013 ¹⁾	Sum	GHG emission reductions [tCO _{2e}] achieved in the monitoring period	-	2,022,416
	until 31/12/2012 ¹⁾	from 01/01/2013 ¹⁾	Sum							
GHG emission reductions [tCO _{2e}] achieved in the monitoring period	-	2,022,416	2,022,416							
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 correctly applied to the calculations of GHG emission reductions or net anthropogenic GHG removals in accordance with the project standard.									

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 30th periodic verification 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 19/04/2015 to 10/01/2017 (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 and revised 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 appropriately (except for the delay in the calibration of meters AT-218002 and FT-21492 - for which appropriate adjustments to the measured values have been applied).
- 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: 2,022,416 tCO_{2e}.

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.: 30 (= MP 3/CP.2)

from: 19/04/2015

to: 10/01/2017

(including both days) as follows:

GHG ER: 2,022,416 tCO_{2e}.

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

Essen, 22/12/2017




R. Winter
Team leader

Appendix 1. Abbreviations

Abbreviations	Full texts
AOR	Ammonia Oxidation Reactor
AFC	Abu Qir Fertilizer Co. S.A.E
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 _{2e}	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
NA	Nitric Acid
ODL	Original Data Level
PA	Project Activity
PDD	Project Design Document
PP	Project Participant
PRC	Post Registration Change

RfRCP	Request for Renewal of Crediting Period
QA/QC	Quality Assurance / Quality Control
SB	Standardized Baseline
SGS	SGS United Kingdom Ltd. Systems & Services Certification
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



Statement of Competence
Appointment and authorization according to the procedures
of the TUV NORD JICDM Certification Program

Mr. Stefan Winter


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2017-02-27
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2017-02-27

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_S01-VA050-F23_2015-01-05_rev4.doc S01-VA050-F23 rev3 / 2013-10-28



Statement of Competence
Appointment and authorization according to the procedures
of the TUV NORD JICDM Certification Program

Mr. Grzegorz Kochaniewicz


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2019-02-08
VCS / ISO 14064-2	Senior Assessor	2019-02-08

Authorization status for technical areas within sectoral scopes:

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

173 – Rev. 7, Date: 2016-02-09

173_S01-VA050-F23_2016-02-09_rev7.doc S01-VA050-F23 rev3 / 2013-10-28



Statement of Competence
Appointment and authorization according to the procedures
of the TUV NORD JICDM Certification Program

Mr. Rainer Winter


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_S01-VA050-F23_2016-07-01_rev10.doc S01-VA050-F23 rev3 / 2013-10-28



Statement of Competence
Appointment and authorization according to the procedures
of the TUV NORD JICDM Certification Program

Mr. Ramy Marei

SCHEME	STATUS	VALID UNTIL
CDM	Host Country Expert (Egypt)	-
J1	Host Country Expert (Egypt)	-
VCS / ISO 14064-2	Host Country Expert (Egypt)	-

194 – Rev. 1, Date: 2015-01-08

S01-VA050-F23 rev3 2013-10-28 formerly F233.doc S01-VA050-F23 rev3 / 2013-10-28

Appendix 3. Documents reviewed or referenced

No.	Author	Reference	Title	References to the document	Provider
1	SGS	/14001/	ISO 14001 Certificate of AFC	-	Other
2	SGS	/9001/	ISO 9001 Certificate of AFC	-	Other
3	UNFCCC	/ACM19/	ACM0019 ver.02.0, "N ₂ O abatement from nitric acid production"	http://cdm.unfccc.int/methodologies/DB/MNMFNF10VUEQJACEIRX3EHYC9QXGDC	Other
4	Several authors	/CAL/	Calibration documents	-	Other
5	DOE	/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)	(internal)	Other
6	PP	/DR/	Daily reports (in CSV and PDF format)	-	Other
7	Emerson Process Management	/DV-CF/	Technical Information by Emerson regarding calibration frequency of the Delta-V system	-	Other
8	Emerson Process Management	/DV-VC/	Technical Information by Emerson regarding version control of the Delta-V system	-	Other
9	AFC	/GC/	Gas-chromatograph Tail gas analysis reports	-	Other
10	UNFCCC	/GOT/	Glossary "CDM terms" (version 08.0 and 9.1)	http://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=MIR8bnVjaDVjfdDJ8RukGxw9IIMJffc3Ff8E	Other
11	PP	/IL/	List of installed instruments and calibration status	-	Other
12	IPCC	/IPCC/	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book 3. IPCC publications	www.ipcc-nggip.iges.or.jp	Other
13	KROHNE Messtechnik	/K-CF/	Technical Information by Krohne regarding calibration frequency of the variable area flow meter	-	Other
14	UNFCCC	/KP/	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
15	UNFCCC	/MA/	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
16	PP	/MR/	Monitoring Report for CDM project:	-	Other

			<p>“Catalytic N₂O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.” version 1, dated 31/03/2017</p> <p>“Catalytic N₂O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.” version 1.1, dated 08/06/2017</p> <p>“Catalytic N₂O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.” version 1.2, dated 13/12/2017</p>		
17	UNFCCC	/MRT/	Monitoring Report Form (CDM-MR-FORM), Version 5.1	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
18	GASCO	/NGC/	Natural gas Certificates	-	Other
19	UNFCCC	/PDD/	<p>PDD for CDM project: “Catalytic N₂O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.” version 4.1, dated 11/09/2013</p> <p>PDD for CDM project: “Catalytic N₂O destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.” version 4.s, dated 13/12/2017, submitted for approval along with the Validation report form for post-registration changes for CDM project activities</p>	http://cdm.unfccc.int/Projects/DB/TUEV-SUED1151930566.53/view	Other
20	UNFCCC	/PS/	CDM Project Standard (Version 9.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
21	TÜV Rheinland	/QAL1/	QAL 1 Certificate of the anubar	-	Other
22	AIRTEC	/QAL2/	QAL 2 Report according to EN 14181, dated: 2014-08-14	-	Other
23	PP	/QAL3/	Shewhart control cards / QAL 3 records	-	Other
24	PP	/QMS/	Quality Management System Procedures	-	Other
25	UNFCCC	/SAMPLE/	<p>“Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities” (Version 03.0)</p> <p>“Standard for Sampling and Surveys for CDM Project Activities and Programme Activities” (version 4.1)</p>	https://cdm.unfccc.int/Reference/Guidclarif/index.html http://cdm.unfccc.int/Reference/Standards/index.html	Other
26	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 	http://cdm.unfccc.int/Reference/tools/index.html	Other
27	PP	/VAL/	<ul style="list-style-type: none"> Validation Report for CDM project “Catalytic N₂O 	http://cdm.unfccc.int/Projects/DB/	Other

			destruction project in the tail gas of the Nitric Acid Plant of Abu Qir Fertilizer Co.” revision No. 5, dated 02/12/2013	TUEV-SUED1151930566.53/view	
28	Several authors	/VER/	Documents of previous verifications (Monitoring reports, verification reports, ER calculation sheets)	http://cdm.unfccc.int/Projects/DB/TUEV-SUED1151930566.53/view	Other
29	UNFCCC	/VVS/	CDM Validation and Verification Standard (Version 09.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
30	PP	/XLS/	Initial (version 1.0) and final Emission Reductions spreadsheet (version1.1)	-	Other
31	PP	/PRO/	Procedures for Carbon Egypt CDM Project	-	Other
32	Airtec	/AST/	AST Reports 2015 and 2017 according to EN 14181	-	Other
33	SIAD	/SPG/	Span gas nitrogen dioxide certificate valid until 20/08/2017	-	Others
34	Several Autors	/MCC/	Maintenance and Calibration Certificates	-	Others

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:
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	E.3.1	Section no.	Several	Date: 12/07/2017
Description of CL				
MR makes reference to ISO14001: 2004 which is inconsistent to description in registered PDD which refers to ISO14001:2009. Please provide related certificate to identify which standard version is used for the certification of the company.				
Project participant response (1st round)				Date: 17/07/2017
The latest certificate of ISO 14001 issued by third party refers to ISO 14001:2004 standards and hence the MR is consistent with the now valid ISO certificate. Nevertheless, it shall be noted that during the renewal of crediting period (and when elaborating the registered PDD) AFC was certified according to ISO 14001:2009. Both certificates were provided to the DOE during onsite visit.				
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: 17/07/2017
The latest valid certificates ISO14001:2004 (international edition) and ISO14001:2009 (Austrian edition) were provided. The requirements of ISO 14001:2004 and ISO 14001:2009 are identical.				
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	E.6.1	Section no.	B.1	Date: 02/05/2017
Description of CAR				
The MR section B.1 does not report below events during the applied monitoring period:				
<ol style="list-style-type: none"> 1. Ammonia flow meter "Abnormal NH3 reducing agent input" during the period 21/03/2016 (05:00) to 29/03/2016 (22:00) which is impacting calculation of parameter "vi,t,db -Volumetric fraction of greenhouse gas i in the gaseous stream in a time interval t on a dry basis" 2. "AOR temperature element malfunction (TT-21021)" for 13/07/2016 (05:00) to 19/08/2016 (17:00). Clarification on appropriateness of determination of parameter "Number of hours of operation in year y" (h_y) for the corresponding period is requested. 				
Documentation provided by project participant (1st round)				

<p>1. There was abnormal input of reducing agent NH₃ in the period from 21/03/2016 (05:00) to 29/03/2016 (22:00), but the CDM monitoring equipment was working totally fine (especially the analyser) and no recalculation needed to be applied according to the methodology. Hence, the PPs made a remark in the ER worksheet on information purposes only, but did not mention this observation in the MR section B.1 since only observations leading to a recalculation are mentioned here.</p> <p>2. According to the registered PDD for the determination of h_y the values of the instruments with the TAG number TE 21015 and TE 21021 are used. TE 21014 and TE 21020 are used as back-up signals in case of malfunction of the main signals. Since the main signal TE 21021 was malfunctioning in the period from 13/07/2016 (05:00) to 19/08/2016 (17:00) the value of the back-up signal TE 21020 was used according to the registered PDD.</p>			
Project participant response (1st round)			Date: 08/06/2017
<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: 20/06/2017
Clarification was provided.			
<p>1. The emission reduction is measured on the stack, after the ammonia oxidation reactor, where the NH₃ is reduced. Input of the NH₃ is not monitored. The abnormal input of NH₃ did not influence the monitoring activities and did not influence the emissions measured.</p> <p>2. Due to failure of the main temperature transmitter the backup was used. This is in line with procedure defined in the MP of registered PDD.</p>			
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	E.8.1	Section no.	B.1	Date: 02/05/2017
Description of CL				
The section B.1 of MR and the ER worksheet are inconsistent. MR does not report anything pertaining to "Shutdown System Maintenance" on 21/02/2016. See the "Remark" applied in ER sheet - "EnviNOx® unit working at no NH ₃ & CH ₄ input (Shutdown System Maintenance)" for the period 21/02/2016 (10:00) to 22/02/2016 (00:00).				
Project participant response (1st round)				Date: 08/06/2017
In the period from 21/02/2016 (10:00) to 22/02/2016 (00:00) the EnviNOx® unit was working at no NH ₃ & CH ₄ input, but the CDM monitoring equipment was working totally fine and <u>no recalculation needed to be applied according to the methodology</u> . Hence, the PPs made a remark in the ER worksheet on information purposes only, but did not mention this observation in the MR section B.1 since only observations leading to a recalculation are mentioned here.				
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: 20/06/2017
The issue has been clarified sufficiently. In full accordance with equation 4 of the methodology h _{r,y} was set as 0 during the shutdown of EnviNOx®. Therefore no correction of the ER calculation was required.				
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	E.8.2	Section no.	B.1	Date: 02/05/2017
Description of CL				
<p>1. Clarification is requested as to why analyser periodic inspection of AT-218002 was undertaken on consecutive days i.e. 01/06/2016 and 02/06/2016.</p> <p>2. Furthermore, PP is requested to clarify if communication problem occurred due to fault in DCS Module from 01/09/2016 (01:00) to 06/09/2016 (15:00).</p>				
Project participant response (1st round)				Date: 08/06/2017

1. Analyser periodic inspection of AT-218002 has no fixed duration and inspection activities sometimes require more or less time due to additional check / inspection in the consecutive day, but this has no influence on the quality of work. 2. No communication problem took place due to the fault in DCS module. All CDM monitoring equipment was working totally fine, while DCS module event is considered a software issue, which required importing factory secured / protected configuration.		
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: 20/06/2017
1. Clarification was provided. During the inspection of analyser the maximum value of N ₂ O in tail gas flow during the observed monitoring period was applied. 2. During the DCS fault the maximum value of fuel input observed during the monitoring period was applied in the calculation. The reported events did not have influence on monitoring activities. Moreover conservative approach was selected in the calculation of ER which is in line with the approved applied methodology.		
Conclusion Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

CL ID	E.8.3	Section no.	D.2, E.2, ER worksheet	Date: 02/05/2017
Description of CAR				
As per the monitoring plan, the parameters $w_{C,i,y}$ - Weighted average mass fraction of carbon in fuel type i in year y (t C/ton) and $\rho_{i,y}$ - Weighted average density of fuel type i in year y (t/Nm ³) need to furnish certificate from the hydrocarbon supplier at least on annual basis, whereas the ER worksheet reports only one certificate.				
Documentation provided by project participant (1st round)				
The PPs chose the values of certificate from 11/07/2015 to use for the calculation of project emissions related to fossil fuel input. Hence, only this certificate is mentioned in the ER worksheet.				
Project participant response (1st round)				Date: 08/06/2017
<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: 17/06/2017
Parameter $w_{C,i,y}$ and $\rho_{i,y}$ As per registered monitoring plan the related certificate is to be provided at least on a yearly basis. Please clarify how the application of one value as per certificate 11/07/2015 is in line with the provisions in the monitoring plan and further clarify how the calculation of ERs for years 2016 and 2017 is in line with the provisions in the registered PDD and as per related methodology by applying one value for the entire period from year 2015.				
Documentation provided by project participant (2nd round)				
Parameters $w_{C,i,y}$ and $\rho_{i,y}$ were revised in the latest MR (v1.1) and ER calculation sheet (v1.1) by using the NG certificate from 16/05/2015 only. As per the registered monitoring plan, the related certificates are submitted every year (2015, 2016 and 2017), however only the most conservative value was applied for the whole monitoring period (higher project emission & lower emission reduction) to be consistent with the registered monitoring plan.				
Project participant response (2nd round)				Date: 17/07/2017
<input type="checkbox"/> Changes in the PDD	Section(s):		New version No.:	
<input checked="" type="checkbox"/> Changes in MR	Section(s): D.2		New version No.: 1.1	
<input checked="" type="checkbox"/> Changes in XLS	Worksheet(s): MP30_AFC_UNFCCC v1.1_confidential and Natural gas Analysis sheets		New version No.: 1.1	
<input type="checkbox"/> Other:				
DOE assessment (2nd round)				Date: 17/07/2017

PP provided the natural gas certificates from 2015, 2016 and 2017 for verification. The most conservative value among the certificates was applied in the calculation for the entire monitoring period. The weighted average mass fraction of carbon and the weighted average density of natural gas were calculated correctly. This has lead to a minor conservative correction in the ER calculation.

Conclusion

Tick the appropriate checkbox

- ☐ Additional action should be taken (finding remains open)
☒ The finding is closed

CL ID	E.8.4	Section no.	D.2	Date:	12/07/2017
Description of CL					
<p>Parameter: $\rho_{i,y}$ The description under measurement frequency in MR is inconsistent to registered PDD which states "at least on a yearly basis" whereas the MR refers to "on a yearly basis" only. Clarification and revision requested.</p>					
Project participant response (1st round)					Date:
<p>The description under measurement frequency in the revised MR (v1.1) has been updated to be consistent with the registered PDD "at least on a yearly basis".</p>					
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): D.2	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:
<p>The MR was revised. The provided information is consistent with registered MP (please refer to CL E.8.3).</p>					
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	E.5.1	Section no.	A.4 and D.1	Date:	02/05/2017
Description of CAR					
<p>Section A.4 and D.1 of MR refers to "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 03.0.0), however as per registered PDD, the ex-ante parameters are already fixed for the entire crediting period following "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (Version 02.0.0).</p>					
Documentation provided by project participant (1st round)					
<p>The correct version number of the "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" is now applied in accordance with the registered, approved monitoring plan and mentioned throughout the documents.</p>					
Project participant response (1st round)					Date:
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:		
<input checked="" type="checkbox"/>	Changes in MR	Section(s): A	New version No.: 1.1		
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Cover Page	New version No.: 1.1		
<input type="checkbox"/>	Other:				
DOE assessment (1st round)					Date:
<p>Version 02.0.0 of the tool has now been referenced correctly in the MR and ER excel sheet.</p>					
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			

CAR ID	E.5.2	Section no.	A.4 and D.1	Date:	01/12/2017
Description of CAR					
<p>The "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" requires that the measurement of the parameter $C_{H_2O,t,db,n}$ should coincide with the AST, however the PDD (ver. 4.1) requires that this parameter should only be measured as part of the first AST.</p>					
Documentation provided by project participant (1st round)					

The PDD has been revised accordingly and a PRC has been launched.			
Project participant response (1st round)			Date: 13/12/2017
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.7.1	New version No.: 4.2
<input checked="" type="checkbox"/>	Changes in MR	Section(s): B.2.2,	New version No.: 1.2
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:
<input type="checkbox"/>	Other:		
DOE assessment (1st round)			Date: 13/12/2017
The PDD is now fully in line with the requirements of the referenced tool.			
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	

CAR ID	E.7.1	Section no.	E.7	Date: 04/05/2017
Description of CAR				
The monitoring plan information provided for the parameter $V_{t,db,n}$ in section "Monitoring equipment" shows mismatches with regards to the installed probe and transmitter.				
Project participant response (1st round)				
The information given for the parameter $V_{t,db,n}$ in section D was reviewed and updated according to the current situation showing now both, probe and transmitter information.				
Documentation provided by project participant (1st round)				Date: 09/05/2017
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in MR	Section(s): D.2	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: 12/05/2017
The updated information given for the parameter $V_{t,db,n}$ is considered appropriate and complete.				
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		

CAR ID	E.8.1	Section no.	E.8	Date: 02/05/2017
Description of CAR				
Clarify why the expanded uncertainty, as determined during QAL2, is not used as uncertainty to calculate the substitute values during the period of delayed calibration.				
Documentation provided by project participant (1st round)				

The expanded uncertainty determined during latest QAL2 was applied to parameters $V_{t,db,n}$ and $V_{i,t,db}$ during the period of delayed calibration of relevant measurement instruments.

The calculation of the expanded uncertainty has been adopted from the last QAL2 report (issued in 2014 by AIRTEC;

- Attachment 1: N2O of report, section 7.3, p. 12/12 and
- Attachment 2: Volume flow of report, section 7.3, p. 9/9

Combined standard uncertainty N₂O concentration:

$$U_{C\ AMS} = \sqrt{U_{C\ QAL1}^2 + U_{C\ QAL2}^2 + U_{C\ DCS}^2}$$

U_C	%	Data source
$U_{C\ QAL1}$	0.71	is the uncertainty given by the manufacturer (QAL1), expressed as standard deviation;
$U_{C\ QAL2}$	0.80	standard deviation from QAL2 measurements;
$U_{C\ DCS}$	0.00	uncertainty estimated for the DCS, expressed as standard deviation ²

$$U_{C\ AMS} = \sqrt{0.71^2 + 0.80^2 + 0.0^2}$$

$$U_{C\ AMS} = 1.07\%$$

Expanded uncertainty AMS (coverage factor 1.96)

$$U_{AMS} = 1.96 * 1.07 = \pm 2.10\%$$

The expanded overall uncertainty of the measured N₂O concentration is +/-2.10%

Standard uncertainty Volume Flow:

$$U_{C\ AMS} = \sqrt{U_{C\ QAL1}^2 + U_{C\ QAL2}^2 + U_{C\ DCS}^2}$$

U_C	%	Data source
$U_{C\ QAL1}$	1.89	uncertainty given by the manufacturer (QAL1) in percent of certification range expressed as standard deviation;
$U_{C\ QAL2}$	0.51	uncertainty for QAL2 test in percent of measurement range (after QAL2) expressed as standard deviation;
$U_{C\ DCS}$	0.00	uncertainty estimated for the DCS expressed as standard deviation ³

$$U_{C\ AMS} = \sqrt{1.89^2 + 0.51^2 + 0.0^2}$$

$$U_{C\ AMS} = 1.96\%$$

² Remark: The AMS values were taken directly from the DCS system. The uncertainty of the data transfer from AMS to the DCS system and the DCS calculations are therefore included in the QAL2 uncertainty. The uncertainties of the DCS system were set to zero (no double counting).

³ Remark: The AMS values were taken directly from the DCS system. The uncertainty of the data transfer from AMS to the DCS system and the DCS calculations are therefore included in the QAL2 uncertainty. The uncertainties of the DCS system were set to zero (no double counting).

Expanded uncertainty AMS (coverage factor 1.96):

$$U_{AMS} = 1.96 * 1.96 = \pm 3.84\%$$

The expanded uncertainty of the measured volume flow under standard conditions is +/-3.84%

As during the AST the QAL2 results could be confirmed, those values have been applied as maximum permissible error (as per VVS vers. 9 para 395) during the monitoring period for all days w/o valid AST.

The application of those maximum permissible errors in the ER calculation can be tracked in the submitted excel worksheet.

- N₂O concentration ($v_{i,t,db}$)
 1. **Column R** shows the raw data for the period of delayed calibration only.
 2. **Column L** shows the raw data under consideration of applied recalculation – if any; e.g. delay of calibration by applying the expanded overall uncertainty of the measured N₂O concentration ($v_{i,t,db}$) of $\pm 2.10\%$ (reference to column R).
 3. **Column M** shows the data after applying QAL2 / QAL3 factors (if applicable; reference to column L).
 - ➔ A recalculation was applied for the whole period (From: scheduled date of calibration – To: actual date of calibration) ➔ in accordance with para. 395 VVS version 9 the expanded equipment uncertainty of 2.10% acc. to latest QAL 2 report was applied.
- Volume flow ($V_{t,db,n}$)
 1. **Column Q** shows the raw data for the period of delayed calibration only.
 2. **Column J** shows the raw data under consideration of applied recalculation – if any; e.g. delay of calibration by applying the expanded uncertainty of the measured volume flow ($V_{t,db,n}$) under standard condition is $\pm 3.84\%$ (reference to column Q).
 3. **Column K** shows the data after applying QAL2 / QAL3 factors (if applicable; reference to column J).
 - ➔ A recalculation was applied for the whole period (From: scheduled date of calibration – To: actual date of calibration) ➔ in accordance with para. 395 VVS version 9 the expanded equipment uncertainty of 3.84% acc. to latest QAL 2 report was applied.

Project participant response (1st round)		Date: 09/05/2017/, 30/06/2017	
<input type="checkbox"/> Changes in the PDD	Section(s):	New version No.:	
<input checked="" type="checkbox"/> Changes in MR	Section(s): E.4, E.5, title page, A.1	New version No.: 1.1	
<input checked="" type="checkbox"/> Changes in XLS	Worksheet(s): MP30_AFC_UNFCCC v1.1_confidential and Natural gas Analysis sheets	New version No.: 1.1	
<input type="checkbox"/> Other:			
DOE assessment (1st round)		Date: 12/05/2017//02/07/2017	
<p>The values and the calculation of the expanded uncertainties have been correctly determined, considering the results of the last QAL2 and the (delayed) AST.</p> <p>The respective correction factors of 1.0384 and 1.021 have been applied as per the description above on all measured values within the period of delayed AST. No markup has been applied on substitute values. This is deemed to be appropriate. Further, the added detailed description is satisfactory. It can thus be confirmed that</p> <p>(a) in a conservative manner, the adjusted measured values during the period of delayed calibration/AST result in fewer claimed emission reductions;</p> <p>(b) For all measured values taken during the period between the scheduled date of calibration and the actual date of calibration the respective correction factors have been applied.</p>			
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: DD/MM/YYYY
-		
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.
A. P_{production,y}		Nitric acid produced in year y		
<p>a) Measurement / Determination method (VVS, §§ 389, 393) Describe how the monitoring parameter was measured / determined. Focus primarily on the 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/ /IL/ /CAL/</p>	<p><i>Description:</i></p> <p>As per registered PDD and in line with related methodology, the production of Nitric acid is monitored by the installed equipment.</p> <p>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 production is sampled, the density is measured and the nitric acid concentration is determined based on density and temperature. Manually collected sample are analyzed in laboratory and used for crosscheck. Finally, all the data are 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. 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). <p>The daily data of HNO₃ production and daily average concentration are logged in sheet no. 409/1/2/3 F1 which is</p>	Ok	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>used for cross-check purposes.</p> <p><i>Verifier's action:</i></p> <p>The daily production was verified by onsite interview and by a check of the hourly log sheets, calculation spreadsheet and concentration laboratory results against the "Procedures for Carbon Egypt CDM Project", the MP and the applied methodology.</p> <p>Furthermore, the following actions have been taken by the verification team to check the correctness of the data aggregation.</p> <p>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.</p> <p><i>Conclusion:</i></p> <p>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.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><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></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the</i></p>	<p>/QMS/ /MCC/ /IL/ /14001/ /9001/</p>	<p><i>Description:</i></p> <p>The accuracy of the magnetic flow meter is $\pm 0.25\%$, and the accuracy of temperature transmitter is $\pm 0.15^\circ\text{C}$ (in accordance with IEC 751).</p> <p>The data is measured continuously and recorded hourly.</p> <p>All the meters are calibrated according to the registered PDD and methodology (please refer to Appendix 6).</p> <p>QA/QC procedures including calibration, maintenance and recording, procedure for monitoring staff training and</p>	<p>CL E-3.1</p>	<p>OK</p>

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>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>		<p>competence are established and implemented and incorporated in the ISO9001:2009 and ISO14001:2004 procedures of AFC. The emergency procedure for monitoring system is elaborated in the MR and reasonable.</p> <p><i>Verifier's action:</i></p> <p>The data flow and protection process was observed during the onsite verification. It was verified by on-site observation and cross checking the hourly and daily sheets, excel book and "Procedures for Carbon Egypt CDM Project" against the MR. Besides all the calibration reports, the ISO9001:2008 and ISO14001:2004 procedures of AFC were checked by the verification team.</p> <p><i>Conclusion:</i></p> <p>The accuracy of equipment used for monitoring is checked as controlled and calibrated in accordance with the monitoring plan.</p> <p>QA/QC procedures were established and requirements are fulfilled. Nevertheless the CL E.3.1 was raised.</p>		
<p>c) Correctness (VVS, §§ 389, 393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/MR/ /DR/ /XLS/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p> <p>P_{production,y} during this monitoring period are reported in the MR based on the hourly sheets.</p> <p><i>Verifier's action:</i></p> <p>By means of checking the XLS against the hourly and daily sheets, excel book and "Procedures for Carbon Egypt CDM Project".</p> <p><i>Conclusion:</i></p> <p>The value given in the MR is correct.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
B. h_y		Number of hours of operation in year y		
<p>a) Measurement / Determination method (VVS, §§ 389, 393) Describe how the monitoring parameter was measured / determined. Focus primarily on the 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/ /XLS/</p>	<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>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 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 against the XLS.</p> <p><i>Conclusion:</i></p> <p>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. Nevertheless the CL E.6.1 was raised.</p>	<p>CL E.6.1</p>	<p>OK</p>
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) In case of measured (or estimated) values, check whether the accuracy of equipment used for</p>	<p>/MCC/ /IL/ /14001/</p>	<p><i>Description:</i></p> <p>The temperature is measured by two independent measurement points for each reactor. Each measurement point has installed a</p>	<p>OK</p>	<p>OK</p>

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>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></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>	/9001/	<p>transmitter, one is the main signal and the other is the back-up signal.</p> <p>The accuracy of temperature transmitter is ± 0.7 °C; the digital accuracy is in line with IEC 584.</p> <p>The data is measured continuously and recorded hourly.</p> <p>All the meters are periodically calibrated according to the supplier's recommendation and methodology.</p> <p>QA/QC procedures including calibration, maintenance and recording; procedure for monitoring staff training and competence are established and implemented and incorporated in the ISO9001:2008 and ISO14001:2004 procedures of AFC.</p> <p>The data flow and protection process was observed during the onsite verification. Calibration of instruments was checked (please refer to appendix 6).</p> <p><i>Verifier's action:</i></p> <p>It was verified by on-site observation and cross check of the electronic records and against the MR. Besides all the calibration reports, the ISO9001:2008 and ISO14001:2004 procedures of AFC were checked by the verification team.</p> <p><i>Conclusion:</i></p> <p>The accuracy of equipment used for monitoring is checked, controlled and calibrated in accordance with the monitoring plan. By check of the calibration certificates it can be confirmed that the meters were duly calibrated for this entire monitoring period.</p> <p>QA/QC procedures were established and requirements are fulfilled.</p>		
<p>c) Correctness (VVS, §§ 389, 393)</p> <p><i>Determine whether the value given in the monitoring</i></p>	/MR/ /XLS/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p>	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>report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p>h_y during this monitoring period is reported in the MR based on the hourly electronic records.</p> <p><i>Verifier's action:</i></p> <p>By means of checking the XLS against the hourly electronic records.</p> <p><i>Conclusion:</i></p> <p>The value given in the MR is correct.</p>		
C. $h_{r,y}$		Number of hours (h) in year y where the abatement system is by-passed, underperforming or failed		
<p>a) Measurement / Determination method (VVS, §§ 389, 393)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the 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.</i></p>	/PDD/ /ACM19/	<p><i>Description:</i></p> <p>As per the registered PDD and in line with related methodology, $h_{r,y}$ is the number of hours (h) in year y where the tertiary N_2O abatement system is by-passed, underperforming or failing.</p> <p>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. $F_{N2O,tailgas,h} > EF_{existing,y} \times P_{NA,h}$</p> <p>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 $P_{NA,h}$ ($P_{production,y}$).</p> <p><i>Verifier's action:</i></p> <p>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 $F_{N2O,tailgas,h} > EF_{existing,y} \times P_{NA,h}$.</p> <p><i>Conclusion:</i></p> <p>Based on onsite observation and document check, it can be</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		confirmed that the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <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. 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></p>	/ACM19/	<p><i>Description:</i> This is not a directly measured parameter; therefore the accuracy is derived from the original measurement parameters. Please refer to the respective chapters. In case accuracy requirements for the parameters $V_{t,db,n}$, $V_{i,t,db}$, $C_{H_2O,t,db,n}$ and $P_{production,y}$ are met this is deemed to be the case for $h_{r,y}$ as well. <i>Verifier's action:</i> - <i>Conclusion:</i> -</p>	OK	OK
<p>c) Correctness (VVS, §§ 389, 393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/MR/ /XLS/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> $h_{r,y}$ has determined based on the calculation: $F_{N_2O,tailgas,h} > EF_{existing,y} \times P_{NA,h}$ <i>Verifier's action:</i> The values and the respective calculations have been checked for each hour and found to be fully correct. <i>Conclusion:</i> The value in the MR is deemed as appropriate based on the</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		checking of the calculations stated in the ER worksheet.		
D. $V_{t,db,n}$		Volumetric flow of the gaseous stream in time interval t on a dry basis		
<p>a) Measurement / Determination method (VVS, §§ 389, 393) Describe how the monitoring parameter was measured / determined. Focus primarily on the 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/ /DV-CF/ /DV-VC/ /QAL1/ /QAL2/ /AST/</p>	<p><i>Description:</i></p> <p>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 anubar probe, which has been installed on 01/04/2014 (which is before this monitoring period).</p> <p>The instrument is located in the tail gas, downstream of the EnviNOx® reactor (21R004) (at stack of NA plant).</p> <p>The data is measured continuously, read secondly and recorded hourly.</p> <p>The data aggregation procedure applied by the PP is as follows:</p> <ol style="list-style-type: none"> 1. The differential pressure is monitored continuously, converted to volume flow and recorded hourly through the automated data logging system, Delta-V. (DAL-1=ODL). 2. Based on the hourly reports, the final value was reported in the MR (DAL0). <p>The annubar probe has undergone a QAL 2 test from 08/07/2014 to 10/07/2014 and an AST in June 2015 and 2017. 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. This AST has been delayed and only been carried out after the current MP. This is considered as a violation against the UNFCCC calibration requirements and is thus considered as a delayed calibration. Please refer to Appendix 6 of this report for further details of the calibration dates and related delay period.</p>	<p>CAR 7.1 CAR E.8.1,</p>	<p>OK</p>

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<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 Egypt team using Delta-V trend curves (generated from raw data), Delta-V files and the QAL 2 and AST report. Further a comparison with theoretical data has been conducted.</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>However, due to the delayed calibration – in line with the VVS para 395 the maximum permissible error of the instrument has to be added to the measured values (as the AST has confirmed the results of the latest QAL2). The PP has applied the uncertainty – derived from the latest QAL2 as an additive term to the measured values.</p> <p>However, the expanded uncertainty as mentioned in Appendix 6 of this document should be considered in this context. In this context CAR 7.1 and CAR E.8.1 have been raised.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><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</i></p>	<p>/MCC/ /ACM19/ /QAL1/ /QAL2/ /DV-CF/</p>	<p><i>Description:</i></p> <p>During the desk review of Section B.1 delay in the calibration of the meter FT-21492 was reported, whereas the section C and section D.2 of MR are unclear pertaining to application of measures of delayed calibration (refer para 395 a and 396 a of VVS version 09)</p>	CAR E.8.1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>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>	<p>/DV-VC/ /14001/ /9001/ /DR/</p>	<p>The anubar probe has undergone a QAL2 test. As per the respective QAL2 report the uncertainty has been determined to be 3.84%.</p> <p>QA/QC procedures are covered by the ISO 9001:2008 and ISO 14001:2004 procedures of AFC of the nitric acid plant. QA procedures applied are in accordance with the monitoring plan. All transmitters were properly installed and calibrated. Nevertheless the AST calibration was delayed from 09/06/2016 up to the end of monitoring period. The calibration certificate for the AST conducted after the monitoring period on 06/04/2017 was provided as evidence of the work performed.</p> <p>The data flow and protection process was observed during the onsite verification.</p> <p><i>Verifier's action:</i></p> <p>It was verified by on-site observation and cross checking the Delta-V trend curves (generated from raw data) and Delta-V mdi files against the MR. Besides all the calibration reports, the ISO9001:2008 and ISO14001:2004 procedures of AFC were checked by the verification team.</p> <p><i>Conclusion:</i></p> <p>The accuracy of equipment used for monitoring is checked, controlled and calibrated in accordance with the monitoring plan except for delay in calibration (refer CAR E.8.1). By check of the calibration certificates it can be confirmed that the meters were duly calibrated post the due date of validity and the determined error was below the maximum permissible error.</p>		
<p>c) Correctness (VVS, §§ 389, 393)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p>	<p>/MR/ /XLS/</p>	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p>Pending closure of CAR E.8.1.</p>		OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>				
E. $v_{i,t,db}$		Volumetric fraction of greenhouse gas i in a time interval t on a dry basis		
<p>a) Measurement / Determination method (VVS, §§ 389, 393) Describe how the monitoring parameter was measured / determined. Focus primarily on the 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>/IM01/ /PDD/ /ACM19/ /DV-CF/ /DV-VC/ /GC/ /QAL1/ /QAL2/ /AST/</p>	<p><i>Description:</i> As per registered PDD and in line with the applicable methodology, the volumetric fraction of the greenhouse gas i in a time interval t 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_2O 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_2O concentration is measured in ppmv and automatically converted to tN_2O/Nm^3 and $Nm^3 N_2O / Nm^3$ dry gas recorded through the automated data logging system, DeltaV, and hourly reports are generated including the values in ppm and mgN_2O/Nm^3 (DAL-1=ODL).</p>	CAR E.8.4	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>2. Based on the hourly reports, the final value was reported in the MR (DALO).</p> <p>The analyzer has undergone a QAL 2 test from 08/07/2014 to 10/07/2014 and an AST in June 2015. 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. This AST has been delayed and only been carried out after the current MP. This is considered as a violation against the UNFCCC calibration requirements and is thus considered as a delayed calibration. Please refer to Appendix 6 of this report for further details of the calibration dates and related delay period.</p> <p>As per EN 14181 the AST is mandatory for the measurement of the N₂O outlet concentration ($v_{i,t,db}$). As the AST is usually carried out together with the calibration of the Annubar/Differential pressure transmitter the finding related to the application of the expanded uncertainty to account for the delayed calibration applies for this parameter accordingly. The CAR E.8.1 has been raised in this context.</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>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<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>However, due to the delayed calibration – in line with the VVS para 395 the maximum permissible error of the instrument has to be added to the measured values (as the AST has confirmed the results of the latest QAL2). The PP has applied the uncertainty – derived from the latest QAL2 as an additive term to the measured values.</p> <p>However, the expanded uncertainty as mentioned in Appendix 6 of this document should be considered in this context. In this context CAR E. 8.1 has been raised.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <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></p>	<p>/MCC/ /QAL2/ /14001/ /9001/ /QAL1/ /AST/</p>	<p><i>Description:</i></p> <p>The accuracy of the NDIR analyser is considered as determined during the last QAL2.</p> <p>The accuracy of the span gas is also specified as $\pm 1\%$.</p> <p>Numerous QA/QC checks, such as</p> <ul style="list-style-type: none"> - check of analytical function (zero and span check), - EN 14181 compliance (QAL 1 to QAL 3), - Regular checks by the plant maintenance team, - Service checks by the manufacturer and - Data checks by the CDM team <p>are carried out in order to ensure a high data integrity level. The accuracy and the QA/QC check intervals of the monitoring equipment are in accordance with the relevant guidance provided by the CDM Executive Board and in accordance with</p>	CAR E.8.1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>the monitoring plan.</p> <p>Factory instructions by Emerson Process Management for accuracy safeguarding are followed and complied. These are related to regular self-calibration and quality of used calibration gases.</p> <p>The test/span gas used has guaranteed stability until 20/08/2017 and covers the usual measuring range appropriately.</p> <p>QA/QC procedures are documented in the ISO9001:2008 and ISO14001:2004 procedures of AFC of the nitric acid plant. QA procedures applied are in accordance with the monitoring plan.</p> <p><i>Verifier's action:</i></p> <p>The various QA/QC measures and related documentation have been checked during the on-site visit and afterwards on the basis of the submitted full documentation.</p> <p><i>Conclusion:</i></p> <p>QA/QC procedures have been established and requirements are deemed to be fulfilled except for delay in calibration (refer CAR E.8.1). No deviations from the implemented procedures, the PDD and the MP have been identified. Thus it can be confirmed that the meters were duly operated for this entire monitoring period but provisions for delayed calibration have to be adjusted (CAR E.8.1).</p>		
<p>c) Correctness (VVS, §§ 389, 393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should</i></p>	/MR/	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> Please refer to CAR E.8.1</p>	CAR E.8.1,	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.				
F. C_{H2O,t,db,n}		Moisture content of the gaseous stream at normal conditions in the time interval t		
<p>a) Measurement / Determination method (VVS, §§ 389, 393) Describe how the monitoring parameter was measured / determined. Focus primarily on the 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/ /QAL2/ /unfccc/ /TA/</p>	<p><i>Description:</i> As per registered PDD and in line with related tool, 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 date 09/06/2015 in the course of the AST. 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 kgH₂O/m³ 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).</p> <p><i>Verifier’s action:</i> The AST report has been checked and the referenced value could be confirmed based on check with related tool.</p> <p><i>Conclusion:</i> 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 and the value considered is deemed correct so that the gas can be considered as dry.</p> <p>However, the “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” requires that the measurement of the parameter C_{H2O,t,db,n} should coincide with the Annual Surveillance Test; however, it is found that the PDD (v 4.1) requires that this parameter shall only be measured during the</p>	CAR E.5.2	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		first Annual Surveillance Test. In this context CAR E.5.2 has been raised.		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <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/ /QAL2/	<i>Description:</i> The measurement institute (AIRTEC) has confirmed that the measurement has been carried out in line with the above mentioned standard. <i>Verifier's action:</i> The result was verified from the AST report. <i>Conclusion:</i> QA/QC procedures were established and requirements are fulfilled.	OK	OK
c) Correctness (VVS, §§ 389, 393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /PDD/ /XLS/ /QAL2/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) The applied measurement method is appropriate and the value used is deemed correct.	OK	OK
G. FC_{i,j,y}		Quantity of fuel type i combusted in process j during the year y		
a) Measurement / Determination method (VVS, §§ 389, 393) <i>Describe how the monitoring parameter was</i>	/PDD/	<i>Description:</i> Natural gas is used as a reducing agent in the EnviNOX®	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>measured / determined. Focus primarily on the 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.</i>	/ACM19/ /DV-CF/ /DV-VC/ /NGC/ /TA/	<p>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.</p> <p>The meters are located in the natural gas line, upstream of the EnviNOX® reactor.</p> <p>The data is measured continuously, read secondly and recorded hourly.</p> <p>The data aggregation procedure applied by the PP is shown as follows:</p> <ol style="list-style-type: none"> 1. The natural gas input is measured in Nm³ and recorded through the automated data logging system, DeltaV, and hourly reports are generated including the values in Nm³ and tCH₄. (DAL-1=ODL). 2. Based on the hourly reports, the final value was reported in the MR (DAL0). <p><i>Verifier's action:</i></p> <p>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.</p> <p><i>Conclusion:</i></p> <p>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.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><i>In case of measured (or estimated) values, check</i></p>	/14001/ /9001/	<p><i>Description:</i></p> <p>The accuracy of natural gas flow meter is ±1.6% (in accordance</p>	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>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></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>	<p>/MCC/ /K-CF/ /DV-CF/</p>	<p>with VDI/VDE 3513), the accuracy of temperature transmitter is $\pm 0.1\%$ of calibrated span, and the accuracy of pressure transmitter is $\pm 0.075\%$ of calibrated span.</p> <p>The accuracy and the calibration interval of the monitoring equipment is in accordance with the relevant guidance provided by the CDM Executive Board and is controlled and calibrated in accordance with the monitoring plan.</p> <p>The inspection reports including the test results from the calibration procedures performed were checked and the transmitters were reported to meet the applicable specifications.</p> <p>QA/QC procedures are covered by ISO9001:2008 and ISO14001:2004 procedures of AFC. QA procedures applied are in accordance with the monitoring plan. The meters were properly installed and calibrated. Instruments have a valid calibration covering the whole monitoring period. The calibration certificates were provided as evidence of the work performed.</p> <p>The data flow and protection process was observed during the onsite verification.</p> <p><i>Verifier's action:</i></p> <p>It was verified by on-site observation and checking the calibration records against the MR. Besides the ISO9001:2008 and ISO14001:2004 procedures of AFC were checked by the verification team.</p> <p><i>Conclusion:</i></p> <p>The accuracy of equipment used for monitoring is checked, controlled and calibrated in accordance with the monitoring plan. By check of the calibration certificates it can be confirmed that the meters were duly calibrated for this entire monitoring period.</p> <p>QA/QC procedures were established and requirements are fulfilled.</p>		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
c) Correctness (VVS, §§ 389, 393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /PDD/ /XLS/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) The applied measurement methods, the equipment installed and the results achieved are deemed appropriate and thus the final value used for ER calculation is deemed correct.	OK	OK
H. $w_{C,i,y}$		Weighted average mass fraction of carbon in fuel type i in year y		
a) Measurement / Determination method (VVS, §§ 389, 393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the 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.</i>	/PDD/ /ACM19/ /NGC/	<i>Description:</i> 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. <i>Verifier's action:</i> During on-site visit the certificates and the calculation have been checked. Further the calculation has been reproduced and found to be fully correct. <i>Conclusion:</i> 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. Nevertheless the CL E.8.3 was raised.	CL E.8.3	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <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/ /GC/	Description: The accuracy is dependent on the gas-chromatograph results as achieved and provided by the gas supplier and thus outside the control of the operator. Verifier's action: The analysis has been checked for plausibility and the calculation has been reproduced. Conclusion: The CL E.8.3 was raised.	CL E.8.3	OK
c) Correctness (VVS, §§ 389, 393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /XLS/ /PDD/ /NGS/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment) Description: The calculation of Weighted average mass fraction of carbon in fuel type i in year y is deemed correct based on check with PDD as well as XLS as well as crosscheck with further supporting documents. The CL E.8.3 was raised	CL E.8.3	OK
I. $\rho_{i,y}$		Weighted average density of fuel type i in year y		
a) Measurement / Determination method (VVS, §§ 389, 393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the ODL but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i>	/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.	CL E.8.3 CL E.8.4	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>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.</i>		<p>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.</p> <p><i>Verifier's action:</i></p> <p>The analysis certificates have been checked and the calculation has been reproduced.</p> <p><i>Conclusion:</i></p> <p>The value used for the ER calculation has been fully derived as described in the MP.</p> <p>The CL E.8.3 and CL E.8.4 were raised</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><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. 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></p>	/MCC/ /GC/	<p><i>Description:</i></p> <p>The accuracy is dependent on the gas-chromatograph results as achieved and provided by the gas supplier and thus outside the control of the operator.</p> <p>QA/QC procedures are not applicable.</p> <p><i>Verifier's action:</i></p> <p>The analysis has been checked for plausibility and the calculation has been reproduced.</p> <p><i>Conclusion:</i></p> <p>The value used for the ER calculation has been derived as described in the MP.</p> <p>The CL E.8.4 was raised</p>	CL E.8.4	OK
<p>c) Correctness (VVS, §§ 389, 393)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p>	/MR/ /PDD/ /XLS/	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i></p> <p>The value has been calculated as described in the monitoring</p>	CL E.8.4	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>		plan based on the registered PDD. Further XLS has been checked. The CL E.8.4 was raised		

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	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
FT21411	$P_{\text{production},y}$	0252528	Magnetic flow meter	$\pm 0.25\%$	2013-10-17	2015-06-29	2017-06-28	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		0870188456			2015-09-18	2016-03-31	2018-03-30	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
TE21042	$P_{\text{production},y}$	2551332	Temperature transmitter	$\pm 0.15^{\circ}\text{C}$	2013-10-28	2015-06-29	2017-06-28	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		09846352			2015-09-10 2015-12-20	2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
TE21015	h_y	2304377	Temperature transmitter (Main Meter)	$\pm 0.7^{\circ}\text{C}$	2013-09-03	2015-06-29 2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
TE21014	h_y	2304376	Temperature transmitter (Back up)	$\pm 0.7^{\circ}\text{C}$	2013-09-03	2015-06-29 2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
TE21021	h_y	2304379	Temperature transmitter (Main Meter)	$\pm 0.7^{\circ}\text{C}$	2013-09-03	2015-06-29 2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
TE21020	h_y	2304378	Temperature transmitter (Back meter)	$\pm 0.7^{\circ}\text{C}$	2013-09-03	2015-06-29 2016-11-16	2018-11-15	<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	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
FT-21492	$V_{t,db,n}$	QAL2	Complete measuring system	3.84 % (as per QAL 2)	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)	2015-06-09	- (after the MP 2017-04-06)	2018-04-05	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 2016-06-09 To: 2017-01-10
FT-21492	$V_{t,db,n}$ (at stack)	13069588	Differential pressure transmitter	1.89 % (as per QAL 1)	monthly	2015-05-07 2015-06-04 2015-06-30 2015-07-28 2015-08-27 2015-09-25 2015-10-22 2015-11-19 2015-12-17 2016-01-14 2016-02-11 2016-03-10 2016-03-31 2016-04-28 2016-05-26 2016-06-23 2016-07-21 2016-08-18 2016-09-15 2016-11-16 2017-01-12	2017-02-11 (4 weeks as per QAL1)	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 2016-10-16 To: 2016-11-15 and From: 2016-12-17 To: 2017-01-10
AT218002	$V_{i,t,db}$	QAL2	Complete measuring system	2.1 % (as per QAL 2)	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)	2015-06-09	- (after the MP 2017-04-06)	2018-04-05	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 2016-06-09 To: 2017-01-10
AT218002	$V_{i,t,db}$	990561462895	NDIR	±1%	Zero calibration	Automatically	Done on daily	<input checked="" type="checkbox"/> No	From:

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
			Analyser		daily Span calibration every other day		basis	<input type="checkbox"/> Yes	To:
FT218002	FC _{i,j,y}	6/191199.001	Natural gas flow meter	±1.6%	2015-04-08	-	2017-04-07	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		011008523.001			2015-04-01 2015-07-01 (installation)	2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
TE218004	FC _{i,j,y}	2420017	Temperature transmitter	±0.1%	2013-09-03	2015-06-29 2016-11-16	2018-11-15	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
PT218004	FC _{i,j,y}	8195466	Pressure transmitter	±0.075%	2015-04-08	-	2017-04-07	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	From: To:
		8657991			2015-03-31 2015-07-01 (installation)	2016-11-16	2018-11-15	<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>
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		