VERIFICATION REPORT

CHEMGAS NITROUS OXIDE ABATEMENT PROJECT

Monitoring Period:
30 March 2012 to 3 December 2012

(ITL Project ID: RO1000486)

REPORT NO. 2012-1719
REVISION NO. 01

DET NORSKE VERITAS

VERIFICATION REPORT

Date of first issue: 20 December 2012	Project No.: PRJC-428948-2012-CCS-NOR
Approved by Trine Kopperud	Organisational unit: DNV KEMA Energy & Sustainability Accredited Climate Change Servicess
Client: S.C. Chemgas Holding Corporation S.R.L.	Client ref.: Ms. Ticleanu Olivia

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Summary:

DNV Climate Change Services AS (DNV) has performed the verification of the emission reductions reported for the Joint Implementation (track 1) project activity "Chemgas Nitrous Oxide Abatement Project" for the period 30 March 2012 to 3 December 2012.

In our opinion, the GHG emission reductions reported for the project in the monitoring report (Version 02.1) of 18 December 2012 are fairly stated and are accurate and free of material errors, omissions, or misstatements.

The GHG emission reductions were calculated correctly on the basis of the approved CDM monitoring methodology AM0034 (version 05.1.0) and the monitoring plan contained in the Project Design Document of 26 January 2012.

DNV Climate Change AS is able to verify that the emission reductions from the Joint Implementation (track 1) project activity "Chemgas Nitrous Oxide Abatement Project" during the period 30 March 2012 to 3 December 2012 amount to 286 492 tonnes of CO_2 equivalent.

Report No.: 2012-1719	Subject Group: Environment
Report title: Chemgas Nitrous Oxide Abatement Project	
Work carried out by: Rafi-ud-Din Khawaja, Fahad Saleem	
Work verified by: Trine Kopperud	
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Indexing terms

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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
ERU	Emission reduction units
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
LoA	Letter of approval
N_2O	Nitrous oxide
PDD	Project Design Document
tCO_2e	Tonnes of CO_2 equivalents
UNFCCC	United Nations Framework Convention on Climate Change
GWP	Global Warming Potential

1 INTRODUCTION

S.C. Chemgas Holding Corporation S.R.L. has commissioned DNV Climate Change Services AS (DNV) to carry out the verification of the emission reductions reported for the Joint Implementation (track 1) project activity "Chemgas Nitrous Oxide Abatement Project" (the project) in the period 30 March 2012 to 3 December 2012. This report contains the findings from the verification and a verification statement for the certified emission reductions.

1.1 Objective

Verification is the periodic independent review and *ex post* determination by an Accredited Independent Entity (AIE) of the monitored reductions in GHG emissions that have occurred as a result of a Joint Implementation (JI) project activity during a defined monitoring period.

The objective of this verification was to verify the emission reductions reported for the "Chemgas Nitrous Oxide Abatement Project" for the period 30 March 2012 to 3 December 2012.

DNV is an Independent Entity accredited by the Joint Implementation Supervisory Committee (JISC) for all sectoral scopes.

1.2 Scope

The scope of the verification is:

- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material errors, omissions, or misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that reported emission reductions are complete and accurate in order to be certified.

1.3 Description of the Project Activity

Project Parties:	*Romania (Host) and Sweden*
Title of project activity:	*Chemgas Nitrous Oxide Abatement Project*
ITL Project ID:	*ITL project number: RO1000486*
CDM baseline and monitoring methodology	*AM0034 (version 05.1.0)*
Project Participants:	*S.C. Chemgas Holding Corporation S.R.L. from Romania and MGM Carbon Portfolio, S.a.r.1. from Sweden*
Location of the project activity:	*Ialomita Slobozia, Slobozia, Romania*
Project's crediting period:	*30 March 2012 to 31 December 2012*
Period verified in this verification:	*30 March 2012 to 3 December 2012*

1.4 Methodology for Determining Emission Reductions

The project applied a baseline and monitoring methodology approved for CDM projects, i.e. AM0034, version 05.1.0 "Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants" /31/.

The baseline emissions are to be determined by multiplying baseline emission factor ($tN_2O/tHNO_3$), nitric acid production ($tHNO_3$) and the global warming potential of N_2O (GWP: 310). The baseline emission factor was determined from the data obtained during a baseline campaign before De-N_2O catalyst was installed.

The project emission is determined similarly by multiplying project emission factor ($tN_2O/tHNO_3$), nitric acid production ($tHNO_3$) and the global warming potential of N_2O (GWP: 310). Project emission factor was determined from the data obtained during a project campaign after De-N_2O catalyst was installed.

The amounts of N_2O emitted that are used to determine the baseline and project emission factors are the product of N_2O concentration (mgN_2O/m^3) and gas flow rate (m^3/h) monitored at the tail gas line before and after the installation of De-N_2O catalyst, respectively.

The emission reductions are calculated by using the following formula;

$$ER = (EF_{BL} - EF_P) * NAP * GWP_{N2O} \qquad (tCO_2e)$$

where:

ER:	Emission reductions of the project for the Project campaign (tCO_2e)
NAP:	Nitric acid production for the Project campaign ($tHNO_3$). The maximum value of NAP shall not exceed the design capacity.
EF_{BL}:	Baseline emissions factor ($tN_2O/tHNO_3$)
EF_P:	Emissions factor used to calculate the emissions from this particular campaign

The average mass of N_2O baseline emissions per hour is estimated as product of the NCSG and VSG after applying statistical process as per the methodology requirements. The N_2O emissions per campaign are estimates product of N_2O emission per hour and the total number of complete hours of operation of the campaign using the following equation:

$$BE_{BC} = VSG_{BC} * NCSG_{BC} * 10^{-9} * OH_{BC} \qquad (tN_2O)$$

The plant specific baseline emissions factor representing the average N_2O emissions per tonne of nitric acid over one full campaign is derived by dividing the total mass of N_2O emissions by the total output of 100% concentrated nitric acid for that period. The overall uncertainty of the monitoring system is determined and the measurement error is expressed as a percentage (*UNC*). The N_2O emission factor per tonne of nitric acid produced in the baseline period (EF_{BL}) shall then be reduced by the estimated percentage error as follows:

$$EF_{BL} = (BE_{BC} / NAP_{BC})*(1 - UNC/100) \qquad (tN_2O/tHNO_3)$$

where:

EF_{BL}:	Baseline emissions factor ($tN_2O/tHNO_3$)
BE_{BC}:	Total N_2O emissions during the baseline campaign (tN_2O)

$NCSG_{BC}$:	Mean concentration of N_2O in stack gas during the baseline campaign (mgN_2O/m^3)
OH_{BC}:	Operating hours of AORs during the baseline campaign (h)
VSG_{BC}:	Mean stack gas volume flow rate in the baseline measurement period (m^3/h)
NAP_{BC}:	Nitric acid production during the baseline campaign ($tHNO_3$)

The average mass of N_2O project emissions per hour is estimated as product of the NCSG and VSG. The N_2O emissions per campaign are estimates product of N_2O emission per hour and the total number of complete hours of operation of the campaign using the following equation:

$$PE_n = VSG * NCSG * 10^{-9} * OH \qquad (tN_2O)$$

where:

VSG:	Mean stack gas volume flow rate for the project campaign (m^3/h)
NCSG:	Mean concentration of N_2O in stack gas for the project campaign (mgN_2O/m^3)
PEn:	Total N_2O emissions during the nth project campaign (tN_2O)
OH:	Operating hours of AORs in the specific monitoring period (h)

A campaign specific emissions factor is calculated by dividing the total mass of N_2O emissions during that campaign by the total production of 100% concentrated nitric acid during that same campaign as follows:

$$EF_n = PE_n / NAP_n \qquad (tN_2O/tHNO_3)$$

In AM0034 version 3.2 no leakage calculation is required.

2 METHODOLOGY

DNV has assessed and determined that the implementation and operation of the project activity, and the steps taken to report emission reductions comply with JI criteria and relevant guidance provided by the JI Supervisory Committee. The verification of the emission reductions has assessed all factors and issues that constitute the basis for emission reductions from the project. These include:

i) Emission factors for baseline, 1st campaign calculated as described above in section 1.4 above /3/;

ii) Records related to measuring quantity of produced HNO_3 /17/;

iii) Records related to collected data in AMS system (NDIR analyser, flow, temperatures, pressures) /20/;

iv) Catalyst information /13//14//15//16/;

v) Records on calibration of the measuring equipment, standards and calculation software /9//10//11//18//21/.

The verification team has during its preparations identified the key reporting risks and used the assessment to determine to which extent the project operator's control systems were

adequate for mitigation of these key reporting risks. In addition, other areas that can have an impact on reported emission reductions have also undergone detailed audit testing.

The verification process includes desk review of the monitoring report /1/, historical campaigns data, baseline campaign data, and project campaign data and emission reduction calculation spread sheets /2/, updated historical campaigns data, baseline campaign data, and project campaign data and emission reduction calculation spread sheets updated in response to CARs and CLs /3/ and other supporting documents and data. Further, onsite assessments and interviews with those involved in project management and operations are conducted /32/ - /43/. This follows preparation of draft verification report summarizing desk review and on-site assessment findings (i.e. CARs, CLs, and FARs). Upon successful closing of the CARs and CLs raised, the final verification report is prepared. The final report then undergoes a technical review and final approval according to DNV's internal quality assurance procedures.

The data presented in the monitoring report /1/ were assessed by review of the detailed project documentation and production records /17//19//20//26//27/, as well as by interviews with personnel at Chemgas and MGM /32/ - /43/, and observation of collection of measurements, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment /9//10//11//21/. This has enabled the verification team to assess the accuracy and completeness of reported monitoring results; to verify the correct application of the approved monitoring methodology /31/ and the determination of the emission reductions.

In addition all parameters required by the monitoring methodology AM0034, version 05.1.0, /31/ and the management system were assessed during the site visit.

The verification team and their roles and involvement in the verification process are provided in the following table:

Verification team

				Type of involvement					
Role	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA5.1 competence
Team leader (Verifier)	Khawaja	Rafi-ud-Din	Norway	✓	✓	✓	✓		✓
Verifier	Saleem	Fahad	Norway	✓		✓			✓
Technical reviewer	Kopperud	Trine	Norway					✓	✓

Duration of verification

Preparations: 27 November 2012 to 28 November 2012

On-site verification: 29 November 2012

Reporting, calculation checks and QA/QC: 30 November 2012 to 20 December 2012

2.1 Review of Documentation

Basic document for the verification was the monitoring report for monitoring period from 30 March 2012 to 3 December 2012, version 1 dated 24 November 2012 /1/ and spreadsheets with raw data and ERU calculation for historical and baseline campaigns, and the 1st campaign /2/, covering the first monitoring period and which were submitted prior to the site visit.

In addition, the PDD version 2.2 dated 26 January 2012 /26/ was reviewed simultaneously with TÜV SÜD determination report /27/ as well as the approved baseline and monitoring methodology AM0034 version 05.1.0 /31/. The project owner also provided evidences related to QAL1 and QAL2 and AST tests /9//10//11/, information about catalysts and certificates of calibration gases /13//14//15//16//22/.

All provided documents were assessed in accordance with Romanian Track 1 procedure and JI determination and verification manual /7//28/.

The primary documents, logbooks of nitric acid production, calibration reports, laboratory records, daily reports from the data acquisition system were available during the site visit /17/ /20//21/.

2.2 Site Visits

Detailed verification of all data contained in the monitoring report was performed during a site visit at Chemgas plant on 29 November 2012. The on-site assessment involved:

(i) Assessment of the implementation and operation of the JI project activity as per the registered PDD;

(ii) Review of information flows for generating, aggregating and reporting the monitoring parameters;

(iii) Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD;

(iv) A cross-check between information provided in the monitoring report and data from other sources such as plant log books, inventories, purchase records or similar data sources;

(v) A check of the monitoring equipments including calibrations performances and observations of monitoring practices against the requirements of the PDD and the selected methodology;

(vi) Review of calculations and assumptions made in determining the GHG data and emission reductions;

(vii) Identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

Data and information provided by project participants were assessed and confirmed with primary records provided during the site visit /17//20/ and interviews with personnel at Chemgas and MGM /32/ - /43/. Procedures established for ensure monitoring and recording of individual parameters required by monitoring plan and monitoring methodology AM0034, version 05.1.0 /31/ were presented to verification team for assessment.

This has enabled the verification team to assess the accuracy and completeness of the reported monitoring results and to verify the correct application of the approved monitoring methodology and the determination of the reductions in N_2O emissions except findings found and reported in this document. All issued CARs and CLs were properly resolved by project participants and the monitoring report was updated to Version 02.1 (dated 18 December 2012) /1/ prior to finalization of this version of the verification report.

2.3 Closing out of verification findings

The objective of this phase of the verification was to resolve any issues which needed be clarified prior to DNV's conclusion that i) the project activity has been implemented and operated in accordance with the PDD, ii) the monitoring plan complies with the monitoring methodology and the actual monitoring complies with the monitoring plan and iii) the data and calculation of GHG emission reductions are correct.

A corrective action request (CAR) is issued, where:

i. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
ii. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
iii. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CL) shall be raised if information is insufficient or not clear enough to determine whether the applicable JI requirements have been met.

A forward action request (FAR) is issued for actions if the monitoring and reporting require attention and/or adjustment for the next monitoring period.

The verification team raised four CARs, five CLs and no FARs. The project participants adequately addressed the CARs and CLs raised and have provided an updated monitoring report Version 02.1 of 18 December 2012 and spread sheets /1//3/ (see Appendix A. for more details).

3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the emission reductions reported for the "Chemgas Nitrous Oxide Abatement Project" for the period 30 March 2012 to 3 December 2012.

3.1 Remaining issues, CARs, FARs from determination

Six FARs were open from determination /27/.

FAR 1 was related to providing LoAs at the first verification. The LoA from the host country Romania dated 14 May 2012 and Sweden dated 24 September 2012 /23/ /24/ have been provided to DNV.

FAR 2 was related to quality assurance and quality control procedures and providing to the verifying AIE the updated JI manual. The JI manual has been updated /7/ and was provided to DNV.

FAR 3 was related to contract with the supplier of secondary catalyst, BASF. The contract between BASF and Chemgas dated 8 August 2011 has been provided to DNV along with catalyst invoice and the inspection report /14//15//16/.

FAR 4 was related to providing IPPC permit during first verification. The updated IPPC permit /5/ has been provided to DNV.

FAR5 was related to meeting the compliance with the NO_x requirements. As per the PDD /26/ the period for the implementation of NO_x reduction measures ends on 31 December 31 2012. The plan of action is included in the IPPC permit (mentioned in the PDD) which is valid until 31 December 2014. In accordance with this document Chemgas should reduce NOx emissions to 300 mg/m^3. However, as per the updated IPPC permit /5/, Chemgas should reduce NOx emissions to 185 mg/m^3 by 1 January 2013. DNV has further checked the design documents for the DeNOx reactor (physically inspected the installed reactor during site visit) and the contract for the supply of DeNOx catalyst O4-89 which was updated on 20 October 2011 by extending scope of the contract of 25 June 2008 /6/. The DeNOx catalyst O4-89 contract confirms that the NOx emissions will be reduced to 200 ppm (about 400 mg/m^3), which is higher than the IPPC permit of 185 mg/m^3 by 1 January 2013. However, since similar warranties (200 ppm) were provided by Steuler for Donauchem DeNOx system /6/ and the two plants designs are very similar, DNV is of the opinion that it is expected that Chemgas will show similar results when the DeNOx system is implemented (expected to be implemented in the next shutdown by the end of year 2012). Further, during site visit of 28 November 2012 for Donauchem 3rd verification lower than 185 mg/m^3 NO_x values were observed by DNV. Moreover, since it has been stated that additional actions will be carried out if NO_x limit is not met (refer to CL 5), DNV is anticipating that the NO_x limit will be met..

FAR 6 was related to providing to the verifying AIE complete information regarding normal operating conditions (the normal OT, OP, AFR, AIFR, GS and GC). DNV was provided with complete information regarding the normal operating conditions /2//3//12//13//17//20/and thus the normal operating conditions along with the baseline campaign has been verified by DNV. As per the determination report /27/ the OP_{normal} was based on the plant manual. The OP_{normal} values have been verified against the Chemgas plant's manual /8/.

For more details see Appendix A.

3.2 Project approval by parties included

The LoA has been issued by the host party Romania and Sweden. The LoA from the host country Romania dated 14 May 2012 and Sweden dated 24 September 2012 /23/ /24/ have been provided to DNV.

3.3 Project implementation

DNV verified that the project is implemented in accordance to the description contained in the registered PDD of 26 January 2012 /26/. The verification team confirmed, through visual inspection that all physical features of the proposed JI project activity including data collection systems and storage have been implemented in accordance with the registered PDD. DNV confirmed during the on-site visit that the JI project is completely operational (except that one of the three AORs covered under the project was not operational during site visit).

Campaigns covered in this verification period:

The 1st project campaign that started on 30 March 2012 and was on-going at the end of the monitoring period was covered in this verification /1//2//3/. As per the determination report /27/ the verification of the baseline campaign was included in the scope of the verifying AIE. Thus, the baseline campaign running from 11 April 2011 to 29 March 2012 was also covered in this verification. The determination of the permitted operating ranges was also included in the scope of the verifying AIE /27/. Therefore, the historical campaigns data prior to the baseline campaign from 14 August 2009 to 10 April 2011 was also verified in this verification /2//3//12//13/ (refer to section 3.7.1 for details).

The type of the primary catalyst used during both project campaigns was: 95% Pt, 5% Rh. This was confirmed to be identical with the baseline campaign and the historical project campaigns through the certificates of catalysts and the catalyst invoices /13/. The only change is in the supplier of the primary catalyst – Heraeus from Umicore used in the baseline campaign.

The secondary catalyst used during this monitoring period was provided by BASF and was also verified in the verification /14//15//16/.

In addition, for N_2O analyzer, weekly checking was performed by Shewhart chart /4/. The QAL1, QAL2 and annually AST have been performed and presented to DNV /9//10//11/.

Installation of DeNOx system:

As per the PDD /26/ the period for the implementation of NO_x reduction measures ends on 31 December 31 2012. The plan of action is included in the IPPC permit (mentioned in the PDD) which is valid until 31 December 2014. In accordance with this document Chemgas should reduce NOx emissions to 300 mg/m^3 by 1 January 2013. From the DeNOx design documents, the contract for the supply of DeNOx catalyst O4-89 which was updated on 20 October 2011 by extending scope of the contract of 25 June 2008 /6/ and the progress made that was confirmed during site visit, it is anticipated that the DeNOx reactor will be fully implemented by the end of year 2012.

Further, DNV checked all the special events that took place during the current monitoring period and confirmed that the events reported in Annex II of MR Version 02.1 dated 18 December 2012 are complete and correct. DNV verified this by checking the data from the productions logbook and operational reports /17/. The special events were further verified by checking the trend curves of different operating parameters. It was also confirmed that the shutdown periods (relevant hours) have been excluded from emission reaction calculation /3/.

3.4 Information (data and variables) provided in the monitoring report that is different from that stated in the registered PDD

As per the PDD /26/ and further validated by TÜV SÜD /27/, the plant operates with 3 reactors instead of 4, which is different from the original design. It should be noted that this has been confirmed during determination that this change occurred in 2006 /27/. For this reason the annual design capacity – 240 000 t/year, that is established by Reception Certificate cannot be applied in this project, it is established based on the daily design capacity of the plant with dismounted reactor 1B, which is multiplied by the number of operating days per year. The updated plant design diagram show that after dismounting of reactor 1B, the design capacity is 640 metric tonnes of HNO_3 per day. To ensure the conservativeness of the approach it is assumed that the plant operates 306 days per year (the longest observed period of annual activity), instead of 365 days as suggested in the methodology. This gives the annual capacity of 195 840 tonnes of 100% HNO_3.

The total nitric acid production of 100 567 tons 100% HNO_3 over the monitoring period from 30 March 2012 to 3 December 2012 (i.e. in 246 days) represents that the actual nitric acid production was lower than the design capacity (i.e. 195 840 * 306/246 = 243 605 tonnes 100% HNO_3).

The predicted annual emission reductions in the registered PDD are 538 014 tCO_2e for the year 2012 (365 days) /26/. Thus, the daily emission reductions estimated in the PDD are 1 474 tCO_2e/day for the year 2012. The total emission reductions achieved during this monitoring period from 30 March 2012 to 3 December 2012 (246 days) are 286 492 tCO_2e. This corresponds to 1 168 tCO_2e/day of daily emission reductions for the monitoring period. Thus the actual emission reductions are lower than those estimated in the PDD /26/.

3.5 Compliance of the monitoring plan with the monitoring methodology

The monitoring plan in the registered PDD /26/ was confirmed to be in accordance with the approved monitoring methodology AM0034, version 05.1.0 "Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants" /31/, applied by the JI project activity. All parameters stated in the monitoring plan are monitored and reported appropriately. The monitoring arrangements and sustaining records are sufficient to enable verification of emission reductions.

3.6 Compliance of monitoring with monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the PDD of 26 January 2012.

The below tables describe for each parameter, which is to be measured according to the monitoring plan, how DNV has verified that i) the actual monitoring complies with the monitoring plan and that ii) data have been assessed to correctly support the emission reductions being claimed.

The monitoring of the project is complete and in accordance with the approved monitoring methodology AM0034, version 05.1.0. All parameters stated in the monitoring plan are monitored and reported appropriately. The monitoring arrangements and sustaining records are sufficient to enable verification of emission reductions.

Chemgas uses ABB online analyzer URAS 2000 type for N_2O concentration monitoring and Differential Pressure flow sensor SDF-22 with pressure transmitter Model 265DS for monitoring stack gas flow rate. The QAL1 and QAL2 certificates /9//10/ have been provided to DNV. The latest AST were conducted by SGS Environmental Services in July 2012 and /11/ and confirmed that the N2O analyzer as well as the stack gas flow meter are in compliance with the standard EN 14181.

As QAL3 realization records Shewart chart were provided /4/. The zero and span correction is provided every week and the data is used to produce Shewart chart. The chart shows very few abnormalities, which were corrected by span and zero calibration.

Nitric acid production is measured by a float type level indicator at storage tanks and recorded in log books /17/.

Therefore DNV confirms that all main parameters stated in the monitoring plan are monitored and reported appropriately. The monitoring methodologies and sustaining records are sufficient to enable verification of the reported emissions reductions.

The following table provides details on each parameter monitored:

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	**NCSG (N_2O Concentration in the Stack Gas)** 808.3 mg N_2O/ Nm^3
Measuring frequency:	The values are scanned on 1 second basis and used for calculation of one hour averages.
Reporting frequency:	Hourly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	N_2O concentration is measured by ABB online analyzer URAS 2000 type
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The accuracy is not given in the monitoring plan. The Analyzer is in compliance with the requirements from AM0034 and EN14181, and has valid approval for QAL1, QAL2, and AST /9//10//11/. In addition QAL 3 procedures are applied by Chemgas according to EN 14181. The QAL2 correction factor for the ABB Analyzer is 1.010. DNV confirms correct implementation of these correction factors in the monitored values towards ERU calculations /2//3/.
Calibration frequency /interval:	QAL2 per EN 14181 at least every 3 years, AST per EN 14181 every year in between

	QAL2 tests. QAL 3 on weekly basis.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	QAL2, QAL 3 and AST calibrations intervals are according to PDD specifications and EN14181 /26/.
Company performing the calibration:	SGS for QAL 2/AST and Chemgas for QAL 3.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is(are) calibration(s) valid for the whole reporting period?	Yes.
If applicable, has the reported data been cross-checked with other available data?	Not applicable
How were the values in the monitoring report verified?	Data transfer from data acquisition system to calculation spreadsheet has been checked./20/ No error found.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	This parameter (NCSG) is automatically collected by the data acquisition system. All necessary documentation is collected, referenced and aggregated and is easily accessible in spreadsheets and by review of the stored data. Further daily reports are printed out and stored on site.
In case project participants have temporarily not monitored the parameter, have adequate and conservative assumptions been applied for missing data?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	**VSG (Volume Flow of the Stack Gas)** 89365.11 Nm^3/h
Measuring frequency:	The values are scanned on 1 second basis and used for calculation of one hour averages.
Reporting frequency:	Hourly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Differential Pressure flow sensor SDF-22 with pressure transmitter Model 265DS.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's	The accuracy is not given in the monitoring plan. The flow meter is in compliance with the requirements from AM0034 and EN14181, and has valid approval for QAL1, QAL2, and AST /9//10//11/. The QAL2 correction factor for the volume

specification?	flow meter is 1008. DNV confirms correct implementation of these correction factors in the monitored values towards ERU calculations /2//3/.
Calibration frequency /interval:	QAL2 per EN 14181 at least every 3 years, AST per EN 14181 every year in between QAL2 tests.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	QAL2 and AST calibrations intervals are according to PDD specifications and EN14181 /26/.
Company performing the calibration:	SGS for QAL 2/AST.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is(are) calibration(s) valid for the whole reporting period?	Yes.
If applicable, has the reported data been cross-checked with other available data?	Not applicable
How were the values in the monitoring report verified?	Data transfer from data acquisition system to calculation spreadsheet has been checked./20/ No error found.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	This parameter (VSG) is automatically collected by the data acquisition system. All necessary documentation is collected, referenced and aggregated and is easily accessible in spreadsheets and by review of the stored data. Further daily reports are printed out and stored on site.
In case project participants have temporarily not monitored the parameter, have adequate and conservative assumptions been applied for missing data?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	**TSG (Temperature of the Stack Gas)** The values are not used in the emission reduction estimation. It is only used for VSG normalization.
Measuring frequency:	The values are scanned on 1 second basis and used for calculation of one hour averages.
Reporting frequency:	Hourly
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Pressure transmitters with thermoresistance PT100

Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The accuracy is not given in the monitoring plan. The Pressure transmitters with thermoresistance is in compliance with the requirements from AM0034 and EN14181, and has valid approval for QAL2, and AST /10//11/.
Calibration frequency /interval:	QAL2 per EN 14181 at least every 3 years, AST per EN 14181 every year in between QAL2 tests.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	QAL2 and AST calibrations intervals are according to PDD specifications and EN14181 /26/.
Company performing the calibration:	SGS for QAL 2/AST.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is(are) calibration(s) valid for the whole reporting period?	Yes.
If applicable, has the reported data been cross-checked with other available data?	Not applicable
How were the values in the monitoring report verified?	Data transfer from data acquisition system to calculation spreadsheet has been checked./20/ No error found.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	This parameter (TSG) is automatically collected by the data acquisition system. All necessary documentation is collected, referenced and aggregated and is easily accessible in spreadsheets and by review of the stored data. Further daily reports are printed out and stored on site.
In case project participants have temporarily not monitored the parameter, have adequate and conservative assumptions been applied for missing data?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	**PSG (Pressure of the Stack Gas)** The values are not used in the emission reduction estimation. It is only used for VSG normalization.
Measuring frequency:	The values are scanned on 1 second basis and used for calculation of one hour averages.
Reporting frequency:	Hourly

Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Type DMU01ST pressure transmitter, range 0-0,16 bar
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The accuracy is not given in the monitoring plan. The Pressure transmitter is in compliance with the requirements from AM0034 and EN14181, and has valid approval for QAL2, and AST /10//11/.
Calibration frequency /interval:	QAL2 per EN 14181 at least every 3 years, AST per EN 14181 every year in between QAL2 tests.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	QAL2 and AST calibrations intervals are according to PDD specifications and EN14181 /26/.
Company performing the calibration:	SGS for QAL 2/AST.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is(are) calibration(s) valid for the whole reporting period?	Yes.
If applicable, has the reported data been cross-checked with other available data?	Not applicable
How were the values in the monitoring report verified?	Data transfer from data acquisition system to calculation spreadsheet has been checked./20/ No error found.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	This parameter (PSG) is automatically collected by the data acquisition system. All necessary documentation is collected, referenced and aggregated and is easily accessible in spreadsheets and by review of the stored data. Further daily reports are printed out and stored on site.
In case project participants have temporarily not monitored the parameter, have adequate and conservative assumptions been applied for missing data?	Not applicable

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	**OH (Operating Hours)** 4 196 hours

Measuring frequency:	Daily
Reporting frequency:	Daily
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	Plant automated control system and production log.

	Assessment/ Observation
Data / Parameter: (as in monitoring plan):	**NAP (Nitric Acid Production)** 107 712 t HNO_3
Measuring frequency:	Monitored daily over the period of the project campaigns. Completed for each entire campaign.
Reporting frequency:	Daily
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Type of monitoring equipment:	The determination of diluted nitric acid production by shift is made by means of a float-type level sensor, installed on each nitric acid tank. Using the density temperature measurements taken in the lab actual concentration is calculated hourly. This value is used to calculate 100% nitric acid production.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The accuracy is not given in the monitoring plan. The practice adopted is the standard practice at nitric acid plants in the host country.
Calibration frequency /interval:	Calibrated equipment's are used at the lab following internal procedures. Further the float-type level sensors at the storage tanks have been calibrated /18/ following internal procedures.
Is the calibration interval in line with the monitoring plan? If the monitoring plan does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	The selected frequency represents good monitoring practise.
Company performing the calibration:	BRML for the float-type level sensors
Did calibration confirm proper functioning	Yes

of monitoring equipment? (Yes / No):	
Is(are) calibration(s) valid for the whole reporting period?	Yes.
If applicable, has the reported data been cross-checked with other available data?	Values have been cross-checked from ammonia and further cross-checked with the monthly reports /19/.
How were the values in the monitoring report verified?	The values were verified from the production logs and laboratory reports /17/.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Data is transferred from the production logs to spreadhseets.
In case project participants have temporarily not monitored the parameter, have adequate and conservative assumptions been applied for missing data?	Not applicable

Apart from the above mentioned metered/measured parameters there are a few others, which are calculated or have been set as default in the registered PDD. A brief description of each of these is given below.

Data variable	**Tag. No.**	**Reported value for the project period**	**Assessment /Observation**
$GS_{project}$ (Project Gauze Supplier)	--	Umicore	Verified from catalyst delivery notes/invoices /13/.
$GC_{project}$ (Project Gauze Composition)	--	Pt 95%, Rh 5%	Verified from catalyst delivery notes/invoices /13/.
PE_n Total amount of N_2O emitted by project activity during verification period	calculated	**303.09** tN_2O	This value is calculated based on monitored data as per formula given in section 1.4 of this verification report.
OTh Oxidation temperature in the ammonia oxidation reactor (AOR).	--	°C	This parameter is monitored by thermocouples inside the AOR. However, none of the data is needed in the project campaign. towards the project campaign.

AFR Ammonia Flow rate to the ammonia oxidation reactor (AOR)	--	$kgNH_3/h$	This parameter is monitored by the ammonia flow meter. However, none of the data is needed in the project campaign. towards the project campaign.
AIFR Ammonia to air ratio going into the ammonia oxidation reactor (AOR)	--	%	This parameter is monitored by the ammonia and air flow meters. However, none of the data is needed in the project campaign. towards the project campaign.
EF_n Emissions factor calculated for project Verification Period n	Calculated	**0.00281** $tN2O/tHNO_3$	This value is calculated based on monitored data as per formula given in section 1.4 of this verification report.
EF_{reg} Emission cap for N_2O from nitric acid production set by government or local regulations.	-	--	There is no emission cap during the monitoring period. However, as per the IPPC permit /5/ the N_2O concentration needs to be capped at 392 mgN_2O/m^3 (200 ppm) from 1 January 2013.
EFma,n Moving Average Emission factor	-	**0.00278** $tN_2O/tHNO_3$	Since there is only one campaign (1^{st}) covered in this monitoring period, **EFma,n** is equal to **EF_n**.

Therefore DNV confirms that all main parameters stated in the monitoring plan are monitored and reported appropriately. The monitoring methodologies and sustaining records are sufficient to enable verification of the reported emissions reductions.

3.7 Assessment of Data and Calculation of emission reductions

3.7.1 Historical data and permitted operating conditions

In order to avoid that during the campaign used to determine the baseline emission factor the operation of the nitric acid production plant is manipulated in a way to increase the N_2O generation, and thereby increasing the ERUs, the ammonia flow, ammonia to air ratio,

operating temperature and pressure in the ammonia oxidation reactors, and the manufacture and type of ammonia oxidation catalyst were monitored during one campaign length (baseline campaign) and compared to the historical values. The operating conditions of the baseline campaign were found to be comparable with the operating conditions of earlier campaigns. The baseline N_2O emission factor ($tN_2O/tHNO_3$) is determined from the measurements of N_2O concentration and stack gas flow during the baseline campaign prior to the installation of the secondary catalyst. If the plant operates outside of the permitted range for more than 50% of the duration of this baseline, the emission factor is not valid and the baseline campaign needs to be repeated. The average historic campaign length (CL_{normal}) defined as the average campaign length for the historic campaigns used to define operating condition (the previous five campaigns if available), is used as a cap on the length of the baseline campaign.

As per the PDD /26/, ammonia oxidation catalysts at Chemgas plant consist of 3 platinum gauze layers. During historical operation of the plant the gauzes were periodically replaced, one or two gauze layers at a time, in the following way. One or two of the oldest gauze layers (at the end of the operational lifetime) were removed from the bottom of the gauze pack, while one or two new gauze layers were added on the top of the pack. The other gauze layer(s) remained in the reactor but moved down to a lower position. The same procedure was performed on all 3 reactors simultaneously, so 3 to 6 gauze layers were replaced during one maintenance stop (1 or 2 gauze layers in each reactor). Thus, the definition of a campaign as provided in AM0034 is not applicable to the historic operation of the plant. DNV accept this for the reasons that it had resulted in in lower CL_{normal} when compared with other possible options /12/.

The same has been verified by DNV from the gauze change schedule and further confirmed from the gauzes delivery notes and invoices /12//13/.

The spreadsheets for the historical data for the 5 campaigns from 14 August 2009 to 10 April 2011 were provided to DNV during determination of the project activity, and DNV has performed a final verification of the data during the verification site visit /2//3/. The campaign lengths for these five historical campaigns change from 19 860 $tHNO_3$ (minimum) to 106 783 $tHNO_3$ (maximum). The average campaign length (CL_{normal}) was verified by DNV to be 61 468 $tHNO_3$ /3/.

The primary catalyst supplier and composition for historical campaigns and the baseline campaigns have been provided and verified by DNV /13/.

The catalyst composition is summarised as follows:

	Composition (GC_{normal})	Supplier (GS_{normal})
Primary catalyst installed during historical campaigns	Pt 95%, Rh 5%.	Umicore

According to AM0034 a change in the composition of the ammonia oxidation catalyst in the baseline campaign to a composition other than that used in the previous five campaigns is permissible without any limitation on the N_2O baseline emissions if the following conditions are met:

(i) The baseline catalyst composition is considered as common practice in the industry; or

(ii) The change in catalyst composition is justified by its availability, performance, relevant literature etc.
The use of baseline catalyst by Heraeus (same composition i.e. Pt 95%, Rh 5%) is considered common practice in the industry and deemed reasonable by DNV.

DNV has verified the permitted operating conditions and the values verified are provided in the following table:

Parameter	Tag Nos.	Reported value	Observation/assessment
OT_{normal} Normal range for oxidation temperature	**AOR 1A** 122 100420079 **AOR 1C** 124 100420163 **AOR 1D** 125 100420080	**AOR 1A** 802°C-849°C **AOR 1C** 780°C-820°C **AOR 1D** 793°C-841°C	This value is obtained from the five latest historical campaigns. The temperatures were monitored by PtRh-PT thermocouple ITDR Pascani and Temperature transmitter type S. Recording frequency: Every hour They have been calibrated every two year. The calibration records of the respective thermometers were available on site /21/ and verified and confirmed by DNV. The normal operating temperature was determined as the historical minimum (value of parameter below which 2.5% of the observation lies) and maximum operating conditions (value of parameter exceeded by 2.5% of observations). Spreadsheet provided from the PP was verified to be in line with the operation log by sampling /2//3//17/. Further the calculations were checked and were found by DNV to be as per the methodology requirements.
OP_{normal} Normal range for oxidation pressure	--	170 000- 250 000 Pa	As per the determination report /27/, the normal operating ranges will be determined based on the historic plant data for every AOR separately, except the OP (i.e. OP_{normal}) which is based on operating manual. DNV has further verified the OP_{normal} against the plant's

			manual /8/. The values in plant manual (1.8 to 2.6 bars) are for air pressure. Since oxidation pressure is usually approximately 0.1 bar lower than the air pressure, 0.1 bar was deducted from air pressure parameter on both ends to reach 1.7-2.5 bar for oxidation pressure.

AFR_{max} Maximum ammonia gas flow rate to the AOR	C3251797001004243 100420161 C3251797002003	8 579 kg NH_3/hour	This value is obtained from the five latest historical campaigns. Ammonia inflow to ammonia oxidation reactors has been monitored by differential pressure type flow meter (Honeywell smart pressure transmitter model STD 924) with temperature (Cr-Al thermocouple ITDR Pascani and Temperature transmitter type K) and pressure (Honeywell smart pressure transmitter model STG94L) compensation. Monitoring equipment: Honeywell smart pressure transmitter model STD 924 Recording frequency: Every hour The monitoring equipment has been calibrated every two year. The calibration records of the respective flow meter, thermocouple and pressure gage were available on site /21/ and verified and confirmed by DNV. Spreadsheet used to determine AFR_{max} was available at site-visit and it was verified by comparing with the raw data by sampling /2//3//17/.
$AIFR_{max}$ Maximum ammonia to air ratio	C3251797001004243 100420161 C3251797002003 C3251797001007223 100420162 C3286217001001	9.5 %	This value is obtained from the five latest historical campaigns. For Ammonia flow refer to AFR_{max}above. Air inflow to ammonia oxidation reactors has been monitored by differential pressure type flow meter (Honeywell smart pressure transmitter model STG94L) with temperature (Cr-Al thermocouple ITDR Pascani and Temperature transmitter type K) and pressure

			(Honeywell smart pressure transmitter model STG94L) compensation. Monitoring equipment: Honeywell smart pressure transmitter model STD 924 Recording frequency: Every hour The monitoring equipment has been calibrated every two year. The calibration records of the respective flow meter, thermocouple and pressure gage were available on site /21/ and verified and confirmed by DNV. Spreadsheet used to determine $AIFR_{max}$ was available at site-visit and it was verified by comparing with the raw data by sampling /2//3//17/.
CL_{normal} Average campaign length for the historic campaigns used to define operating condition	N/A	62 614 tonnes 100% HNO_3 Design capacity: 195 840 tonnes of 100% HNO_3. (Based on the PDD and the determination report /26//27/ for 3 operating AORs)	Historical average campaign length for the previous five campaigns. Normal campaign length is expressed by the average nitric acid production per campaign during the five historical campaigns. The nitric acid productions during the historical campaigns were obtained from the production record. The concentration adjustment has been conducted three times a day with laboratory measurement data. Spreadsheet used to determine CL_{normal} was available at site-visit and it was verified by comparing with the raw data by sampling.
GS_{normal} Gauze supplier for the operation condition campaigns	N/A	Umicore	This information is obtained from the five latest historical campaigns. The documentation in form of invoices was provided and checked during the site visit.

GC_{normal} Gauze composition for the operation condition campaigns	N/A	Pt 95%, Rh 5%.	The composition is obtained from the five latest historical campaigns. The documentation in form of invoices was provided and checked during the site visit.

3.7.2 Monitored data for baseline emissions within the project boundary

TÜV SÜD performed a preliminary verification of the partial data (from 13 April 2011 to 25 June 2011) for the N_2O emissions during the baseline campaign during determination of the project activity /27/. The final verification of the baseline campaign data and the determination of the baseline campaign emission factor are thus included in the scope of this verification.

Since CL_{normal} (62 614 $tHNO_3$) < CL_{BL} (138 494 $tHNO_3$), the N_2O values that were obtained during the production of tonnes of nitric acid beyond the CL_{normal} (i.e. the last tonnes produced) were eliminated from the calculation of EF_{BL} (0.01139 tN_2O/t 100% HNO_3) as per the requirement of Annex 12 of EB 51. Further since CLn (107 712 $tHNO_3$) > CL_{normal} (62 614 $tHNO_3$) no recalculation of EF_{BL} was needed.

The complete baseline campaign was from 11 April 2011 to 29 March 2012 and the final verified values are listed in the following table.

Data variable	**Tag Nos.**	**Reported value for the baseline campaign**	**Assessment/Observation**
$NCSG_{BC}$ N_2O concentration in the stack gas during the baseline campaign (mgN_2O/Nm^3)	3.352692.9	3 395 mgN_2O/Nm^3	N_2O concentration is measured by ABB online analyzer URAS 2000 type. A gas stream is continuously drawn from the stack by the sampling system under proper conditions, and driven to the infrared cell. Regular calibrations according to vendor specifications and recognized industry standards (EN 14181) have been ensured /4//10//11/. The values for $NCSG_{BC}$ calculation are scanned every second and used for calculation of one minute and thus hourly averages. Although AM0034 specifies the measurement frequency as

			"every 2 seconds", every second data is acceptable in terms of accuracy. The monitoring ranges of the equipment are appropriate. The calibration has been conducted once every week using standard test gases according to the vendor recommendation. The calibration records were available for verification. The baseline campaign period was confirmed to be covered through the calibration records. The values reported in the spreadsheet have been verified by DNV from the daily reports /20/.
VSG_{BC} Normal gas volume flow rate of the stack gas during baseline campaign	6600067092	93 008 Nm^3/h	Differential Pressure flow sensor SDF-22 with pressure transmitter Model 265DS. Regular calibrations according to vendor specifications and recognized industry standards (EN 14181) have been ensured /10//11/. The values are scanned every second and used for calculation of one minute averages. Although AM0034 specifies the measurement frequency as "every 2 seconds", every second data is acceptable in terms of accuracy. The monitoring ranges of the equipments are appropriate. The values reported in the spreadsheet have been verified by DNV from the daily reports /20/.
TSG Temperature of the Stack Gas	361	Available in excel sheets /2//3/ Used for VSG_{BC} normalization	The stack gas temperature has been measured by Pressure transmitters with thermoresistance PT100. Regular calibrations according to

			vendor specifications and recognized industry standards (EN 14181) has been ensured /10//12/. Normalization for VSG_{BC} is done by AMS automatically /26/ and the normalization procedures verified against QAL 2 report /10/.
PSG Pressure of the Stack Gas	1198951	Available in excel sheets /2//3/ Used for VSG_{BC} normalization	Stack pressure is measured by type DMU01ST pressure transmitter, range 0-0,16 bar. Regular calibrations according to vendor specifications and recognized industry standards (EN 14181) has been ensured /10//11/. Normalization for VSG_{BC} is done by AMS automatically /26/ and the normalization procedures verified against QAL 2 report /10/.
OH_{BC} Baseline Operating Hours	NA	5 227 hours	Plant operating status is determined on the basis of present thresholds for oxidation temperature /2//3/.
CL_{BL} Length of the baseline campaign	NA	138 494 $tHNO_3$	The determination of diluted nitric acid production by shift is made by means of a float-type level sensors, installed on each nitric acid tank. Using the density and temperature measurements taken in the lab actual concentration is calculated hourly. This value is used to calculate 100% nitric acid production. The nitric acid values have been further cross-checked with the monthly reports /19/ and ammonia. Since CL_{normal} (62 614 $tHNO_3$) < CL_{BL} (138 494 $tHNO_3$), the N_2O values that were obtained during the production of tonnes of nitric

			acid beyond the CL_{normal} (i.e. the last tonnes produced) were eliminated from the calculation of EF_{BL} (0.01139 $tN_2O/t100\%$ HNO_3) as per the requirement of Annex 12 of EB 51. Further since CLn (107 712 $tHNO_3$) > CL_{normal} (62 614 $tHNO_3$) no recalculation of EF_{BL} was needed /3/.
NAP_{BC} $tHNO_3$ Nitric acid 100% concentrated produced over a baseline campaign	NA	138 494 $tHNO_3$	See description above for CL_{BL}
UNC Overall Uncertainty of the Monitoring System	NA	4.37 %	The overall uncertainty is calculated as the combined uncertainty of the flow meter and the uncertainty of the N_2O concentration measurements. DNV was able to verify this from AST/QAL2 Report /10//11/ and confirm its correct application towards EF_{BL}.
GS_{BL} Gauze supplier for baseline campaign	NA	Heraeus	The documentation in form of invoices was provided and checked during the site visit /13/.
GC_{BL} Gauze composition for baseline campaign	NA	Pt 95%, Rh 5%	The documentation in form of invoices was provided and checked during the site visit /13/.
AFR Ammonia gas flow rate to the AOR	C3251797001004243 100420161 C3251797002003	Available in excel sheets /2//3/	AFR is continuously monitored. NCSG and VSG values monitored when AFR is exceeding AFRmax are excluded prior to the calculation of the average values for NCSG and VSG /2//3/.
AIFR Ammonia to	C3251797001004243	Available in excel sheets /2//3/	AIFR is calculated from ammonia gas flow and air flow

Air Ration	100420161 C3251797002003 C3251797001007 223 100420162 C3286217001001		to AOR. NCSG and VSG values monitored when AIFR is exceeding AIFRmax are excluded prior to the calculation of the average values for NCSG and VSG /2//3/.
OTh Oxidation temperature for each hour	**AOR 1A** 122 100420079 **AOR 1C** 124 100420163 **AOR 1D** 125 100420080	Available in excel sheets /2//3/	OTh is monitored hourly. NCSG and VSG values monitored when OTh is outside the permitted operating range are excluded prior to the calculation of the average values for NCSG and VSG /2//3/.
OPh Oxidation Pressure for each hour	C3251797002005	Available in excel sheets /2//3/	OPh is monitored hourly. NCSG and VSG values monitored when OPh is outside the permitted operating range are excluded prior to the calculation of the average values for NCSG and VSG /2//3/.
EF_{BL} Emission factor for baseline period	NA	0.01139 tN_2O/t 100% HNO_3	The value has been calculated from monitoring data and its calculations have been checked by DNV and found to be correct. Hourly raw data was made available for verification. EF_{BL} was determine by the following calculations according to AM0034; $BE_{BC} = VSG_{BC} * NCSG_{BC} * 10^{-9} * OH_{BC} = 93\ 008 * 3\ 395 * 10^{-9} * 5\ 227 = 1650.48$ t N_2O $EF_{BL} = (BE_{BC} / NAP_{BC})\ (1 - UNC/100) = (1650.48/138\ 494)(1-4.37/100)$ $= 0.01139\ tN_2O/t$ 100% HNO_3

According to AM0034 /31/, the baseline emission factor is calculated by dividing the total mass of N_2O emissions by the total output of 100% concentrated nitric acid produced in the baseline period and then reduced by the overall uncertainty of the monitoring system.

In order to determine the baseline emission factor, the overall uncertainty of the monitoring system has been determined by QAL2 report which was carried out by SGS Environmental Services in October 2008 /9/.

The baseline emission factor is calculated to be 0.01200 $tN_2O/tHNO_3$. The baseline calculations were verified by DNV during this 1st verification and are deemed to be correctly executed /2//3/.

3.7.3 Monitored data for project emissions within the project boundary

The only emission source from the project is the remaining quantity of N_2O in the stack gas. Details on the monitoring data from project emissions have been provided in section 3.6 above.

During the 1st project campaign 107 712 $tHNO_3$ was produced from 30 March 2012 to 3 December 2012 (248 days), which corresponds to 143 326 $tHNO_3$ per year based on 330 days of operation. This value is less than the annual design capacity of 195 840 tonnes of 100% HNO_3, thus the emission reductions achieved during the periods are eligible.

According to the AM0034 /31/, the campaign specific emissions factor (EF_n) is calculated by dividing the total mass of N_2O emitted during that project campaign by the total production of 100% concentrated nitric acid during the campaign.

The project emission factor for this 1st project campaign is calculated to be 0.00281 $tN_2O/tHNO_3$ /2//3/. The project emission factors calculations were verified by DNV to be correctly executed.

Since there is only one campaign (1st) covered in this monitoring period, **EFma,n** is equal to **EF_n**.

3.7.4 Emission reduction

According to the AM0034 /31/, the emission reductions for the project activity over a specific campaign are determined as follows:

$$ER_n = (EF_{BL} - EF_p) \cdot NAP_n \cdot GWP_{N_2O}$$

Where

ER_n	Emission reductions of the project for the *nth* campaign, tCO_2e
EF_{BL}	Baseline emission factor, in $tN_2O/ tHNO_3$
EF_p	Project emission factor, applicable to the *nth* campaign, in $tN_2O/ tHNO_3$
NAP_n	Nitric acid production during the *nth* campaign of the project activity, in, $tHNO_3$
GWP_{N_2O}	global warming potential, of N_2O set as 310 tCO_2e/tN_2O for the 1st commitment period

As indicated, the present Monitoring period covers only one campaign in the period from 30 March 2012 to 3 December 2012.

The total emission reductions for the 1st project campaign (from 30 March 2012 to 3 December 2012) are calculated to be 286 492 tCO_2e /2//3/.

The emission reductions calculations were checked by DNV and it was verified that they have been correctly executed according to the formulae in the monitoring methodology /31/.

3.8 Quality of evidence to determine emission reductions

Complete set of data for the monitoring period was made available to DNV. DNV confirms that the calculations of baseline and project emission factors have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied monitoring methodology. It should be noted that the project campaign is still on-going by the end of this monitoring period.

The main data are collected continuously by common AMS system and stored in the data acquisition system and daily reports are also produced as a backup /20/. The nitric acid production is reported once per shift (8 hours) manually into the logbook /17/.

The verification team confirmed the consistency of the AMS records, logbooks and excel sheets. Errors, which were found, were corrected prior to finalization of this report (refer to Appendix A).

Calibration of test gases used for zero and span check calibrations (QAL 3) and other measurement devices was demonstrated by individual certificates presented on site /18//21//22/. All calibrations were found as correct and cover the whole monitoring period.

The NDIR N_2O analyser has been calibrated once every week by a built-in calibrator with standard test gases /4/. The calibration frequency is in line with the recommendation of manufacturer. The certificates of the test gases were available for verification /22/.

The other measurements are performed by calibrated equipment according to the documented calibration procedures /7/. The key data were also cross-checked by the verification team via other sources, such as production log sheets /17/, monthly production reports /19/ and meters available in the operators control room or on-site.

3.9 Management system and quality assurance

The project is operated by Chemgas Holding Corporation, which is an ISO certified organization /25/. The monitoring and reporting of data under the JI activity have been conducted by the collaboration of Chemgas and MGM International. The quality assurance and quality control procedures in terms of equipment operation and maintenance as well as data reporting are covered by the documented procedures /7/. The responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan /26/.

Data handling solutions involve redundancy, data manipulation protection, integrity check as well as proper archiving.

The JI project is also subject of the periodical internal audit .

4 VERIFICATION STATEMENT

DNV Climate Change AS (DNV) has performed the verification of the emission reductions that have been reported for the "Chemgas Nitrous Oxide Abatement Project" for the period 30 March 2012 to 3 December 2012.

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project.

It is DNV's responsibility to express an independent verification statement on the reported GHG emission reductions from the project. DNV does not express any opinion on the selected baseline scenario or on the validated and registered PDD.

DNV conducted the verification on the basis of the CDM monitoring methodology AM0034 (version 05.1.0), the monitoring plan contained in the registered Project Design Document of 26 January 2012 and the monitoring report (Version 02.1) dated 18 December 2012. The verification included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

DNV's verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions of the "Chemgas Nitrous Oxide Abatement Project" for the period 30 March 2012 to 3 December 2012 are fairly stated in the monitoring report (Version 02.1) dated 18 December 2012 and are accurate and free of material errors, omissions, or misstatements.

The GHG emission reductions were calculated correctly on the basis of the approved CDM baseline and monitoring methodology AM0034 (version 05.1.0) and the monitoring plan contained in the registered PDD of 26 January 2012.

DNV Climate Change AS is able to verify that the emission reductions from the "Chemgas Nitrous Oxide Abatement Project" during the period 30 March 2012 to 3 December 2012 amount to 286 492 tonnes of CO_2 equivalent.

City and Oslo, 20 December 2012

Rafi-ud-Din Khawaja
JI Verifier
DNV City, Country

Trine Kopperud
Head of Approval Centre & Nordic
DNV Climate Change AS

5 REFERENCES

5.1.1 Documentation provided by the project participants

/1/ MGM International: Monitoring report, version 02 dated 7 December 2012 (previous version 01 dated 24 November 2012

/2/ MGM International initial version of the spreadhseets:
Chemgas 1st Project Campaign -26-11-12.xlsx
Chemgas-baseline calculation-25-11-12.xlsx
Chemgas-historical data-29-11-12 .xlsx

/3/ MGM International revised version of the spreadhseets:
Chemgas 1st Project Campaign -18-12-12.xlsx
Chemgas-baseline calculation-18-12-12.xlsx
Chemgas-historical data-18-12-12 .xlsx

/4/ MGM International: Stewart charts – Chemgas 28-11-12.xlsx

/5/ IPPC Permit (Nr.992 from 26.08.2011) - S.C. Chemgas Holding Corporation S.R.L.

/6/ -S.C. Chemgas Holding Corporation S.R.L.: DeNOx reactor internal design documents Steuler Anlagenbau GmbH & Co. KG and S.C. Chemgas Holding Corporation S.R.L.: Scope Extension of Contract dated 25 June 2008 for DeNOx catalyst O4-89 supply for Chemgas, signed 20 October 2011 (Adendum to Steuler – Chemgas contract)

/7/ S.C. Chemgas Holding Corporation S.R.L.: updated JI Manual dated 23 November 2012

/8/ Chemgas nitric acid plants manual, No. 906 1988

/9/ ABB: QAL1 report according to En 14181 and ISO 14956 for Automated Measuring System (AMS) based on AO2000-Uras26 N2O (6700) dated 22 February 2011

/10/ SGS Environmental Services: QAL2 report dated July 2011, Chemgas nitric acid plant in Slobozia, Investigation period 21 – 23 June 2011

/11/ SGS Environmental Services: AST report dated 19 July 2012, Chemgas nitric acid plant in Slobozia, Investigation period 2 – 3 July 2012

/12/ Gauzes Change Schedule:
gauzes-schedule -chemgas-01-09-11.xls

/13/ Catalyst delivery notes/invoices and gauzes information:
Historical Campaigns:
From 14 August 2009 to 16 March 2010 (Umicore for campaign 5SDS 257 - 259, dated 07 August 2009)
From 17 March 2010 to 18 April 2010 (Umicore for campaign 5SDS 395, dated 24 February 2010)
From 19 April 2010 to 08 August 2010 (Umicore for campaign 5SDS 406 - 411, dated 29 March 2010)
From 09 August 2010 to 28 October 2010 (Umicore for campaign UC 225 - 226 , dated 09 August 2010)
From 29 October 2010 to 10 April 2011 (Umicore for campaign 10H 3017, dated 28 October 2010)

Baseline Campaign:
From11 April 2011 to 29 March 2012 (Heraeus for campaign 10H 3016, dated 08 April 2011)

Project Campaign:
From 30 March 2012 to on-going (Umicore for campaign UC68 – UC76, dated 28 March 2011)

/14/ BASF and S.C. Chemgas Holding Corporation S.R.L.: Catalyst Supply Agreement for N2O Abatement JI-Project dated 8 August 2011

/15/ BASF: Debate Note for the Supply of O3-85 catalyst (secondary catalyst) dated 15 February 2012

/16/ S.C. Chemgas Holding Corporation S.R.L.: Inspection report of the basket and installation of BASF catalyst for N2O destruction, 23 – 27 March 2012

/17/ S.C. Chemgas Holding Corporation S.R.L.: Production logbook and operational reports, laboratory records from August 2009 to 4 December 2012

/18/ BRML: *Calibration certificates for tanks' float-level indicators*:
Tank 1: Nr. PH – 616-149469/01-2011, dated 9 March 2011
Tank 2: Nr. PH – 616-149469/02-2011, dated 9 March 2011
Tank 3: Nr. PH – 616-149469/03-2011, dated 9 March 2011
Tank 4: Nr. PH – 616-149469/04-2011, dated 9 March 2011

/19/ S.C. Chemgas Holding Corporation S.R.L.: Nitric acid production monthly reports from April 2011 to November 2012

/20/ S.C. Chemgas Holding Corporation S.R.L.: Daily reports from data acquisition system, from April 2011 to 4 December 2012

/21/ Calibration Certificates:

- Honeywell smart pressure transmitter model STG94L, Pressure meter in AOR calibrated 16 July 2010 valid 15 July 2012 (last checked 15 November 2012)
- Gauze temperature meter E1A, calibrated 12 March 2010 valid 11 March 2012 (last checked 13 November 2012)
- Gauze temperature meter E1C, calibrated 12 March 2010 valid 11 March 2012 (last checked 13 November 2012)
- Gauze temperature meter E1D, calibrated 12 March 2010 valid 11 March 2012 (last checked 13 November 2012)
- Ammonia flow meter to ammonia air mixer, Honeywell smart pressure transmitter model STD 924, calibrated 26 July 2010 valid 25 July 2012 (last checked 15 November 2012)
- Ammonia gas flow temperature, calibrated 23 March 2010 and 28 December 2010 valid 22 March 2012 and 27 December 2012 (last checked 13 November 2012)
- Ammonia gas flow pressure, Honeywell smart pressure transmitter model STG94L , calibrated 16 July 2010 valid 15 July 2012 (last checked 15 November 2012)
- Air flow meter to ammonia/air mixer, Honeywell smart pressure transmitter model STD924, calibrated 27 July 2010 valid 26 July 2012 (last checked 15 November 2012)
- Air gas flow temperature, calibrated 23 March 2010 and 28 December 2010 valid 22 March 2012 and 27 December 2012 (last checked 13 November 2012)

- Air gas flow pressure, Honeywell smart pressure transmitter model STG94L, calibrated 16 July 2010 valid 15 July 2012 (last checked 15 November 2012)

/22/ Linde: Sampling gases certificates for N_2O: cylinder No. 1475802 dated 09 February 2012 and valid till 8 February 2013, and cylinder No. 3969286 dated 29 June 2012 and valid till 28 June 2013

/23/ DNA of Romania: Letter of Approval (LoA) for Chemgas Nitrous Oxide Abatement Project, No. 1958 dated 14 May 2012

/24/ DNA of Sweden: Letter of Approval (LoA) for Chemgas Nitrous Oxide Abatement Project, Dnr 2012-3712 dated 24 September 2012

/25/ AEROQ: Chemgas: ISO 9001:2008 certificate no. 2108 dated 21.02.2011 valid until 20.12.2012
AEROQ: Chemgas: ISO 14001:2004 certificate no. 657 M dated 21.02.2011 valid until 20.12.2012
AEROQ: Chemgas: SR OHSAS 18001:2008/BS OHSAS 18001:2007 certificate no. 453 S dated 21.02.2011 valid until 20.12.2012

5.1.2 Other project documents or documents used by DNV to verify the information provided by the project participants

/26/ MGM International: JI Project design document for the "Chemgas Nitrous Oxide Abatement Project", version 2.2, 26 January 2012

/27/ TÜV SÜD: JI Determination report No. 600500171, dated 06 February 2012

5.1.3 Methodologies, tools and other guidance by the JI Supervisory Committee

/28/ JI Supervisory Committee, Determination and verification manual, version 01 adopted at JISC 19

/29/ JI Supervisory Committee, Guidance on criteria for baseline setting and monitoring, version 02 adopted at JISC18

/30/ JI Supervisory Committee , Standard for applying the concept of materiality in verifications, version 01 adopted at JISC 22

/31/ CDM-EB: *Approved Baseline and Monitoring Methodology AM0034 - "Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants"*, Version 05.1.0.

5.1.4 Persons interviewed during the verification

/32/ Dudu Viorel, monitoring engineer, S.C. Chemgas Holding Corporation S.R.L.

/33/ Turc Luliea, Coordinator, S.C. Chemgas Holding Corporation S.R.L.

/34/ Alin Anton, Internal Auditor, S.C. Chemgas Holding Corporation S.R.L.

/35/ Dragan Stefan, Production Manager, S.C. Chemgas Holding Corporation S.R.L.

/36/ Birsan Silvia, Person in charge with Dangerous Substances (translater), S.C. Chemgas Holding Corporation S.R.L.

/37/ Gerea Lilana, Production Engineer, S.C. Chemgas Holding Corporation S.R.L.

/38/ Olteanu Constantin, Production Department I, S.C. Chemgas Holding Corporation S.R.L.

/39/ Moise Viorel, Nitri Acid Plant Tehnologist, S.C. Chemgas Holding Corporation S.R.L.

/40/ Ticleanu Olivia, Consular, Interagro S.A.
/41/ Manea Florentina, Consular, Interagro S.A.
/42/ Sergey Klibus, Project Manager, MGM International
/43/ Iana Iulian, Technologist, S.C. DonauChem S.R.L.

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APPENDIX A

CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS

Corrective action requests

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 1	The following corrections need to be made to the MR: - The start date of the baseline campaign need to be changed to 11 April 2011on the title page of the MR and the corresponding edits need to be made to other sections and the relevant baseline date spreadsheet. - Corresponding edits to the below listed CARs and CLs need to be made to the MR.	The correspondent changes have been made in MR	Corresponding edits have been made in the MR. CAR 1 is closed.

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 2	While checking the historical data from 14August 2009 to 19 April 2011 against the plant records, it was found out that the period from 1 December 2009 (9:00) to 6 December 2009 (9:00) has been reported as a shutdown period; however, the plant was actually in operation during this period. Further the wrong values for NAP have been reported in the spreadsheet during the historical campaigns for 16-19 August 2009, 28 September 2009 -3 October 2009, and on 23 December 2009. Moreover the end date of the 5th historical campaign needs to be changed from 19 April 2011 to 10April 2011 to match with the gauze change records and corresponding changes need to be made to the updated MR and spreadsheet. The updated historical data needs to be provided to DNV.	The correspondent changes have been made in Excel file.	The corresponding changes have been made in the historical data and updated historical data have been provided to DNV /3/. DNV has checked the updated historical data and found it to be correct. CAR 2 is closed.
CAR 3	The baseline data was off by one day in the spreadsheet; this needs to be corrected and updated baseline data spreadsheet needs to be provided to DNV.	The correspondent changes have been made in Excel file.	The corresponding change has been made in the baseline data and the updated baseline data have been provided to DNV /3/. DNV has checked the updated baseline campaign data and found it to be correct. CAR 3 is closed.

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 4	The project campaign data up to 8 November 2012 has been provided. Since the monitoring period ends on 21 November 2012, full data set including the period from 8 November onwards need to be provided in the updated project campaign data sheet and the calculations need to be revised.	The correspondent changes have been made in Excel file.	The corresponding change has been made in the project data and the updated project data have been provided to DNV /3/. DNV has checked the updated project campaign data and found it to be correct. Further the end of the monitoring period has been extended to 3 December 2012 (refer to CL 4 below). Data from 8 November to 2012 to 28 November 2012 was checked from the remaining datasheets provided during the site visit against the production logs and AMS daily reports and found to be correct. While the data from 29 November 2012 to 3 December 2012 was checked against the scanned copies of the production logs and the daily reports form AMS /17//20/. CAR 4 is closed.

Clarification requests

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 1	For two of the sampled dates (e.g. 11 – 12 April 2011), please clarify how the actual concentration of the nitric acid produced is taken into account while calculating HNO_3 of 100% concentration. (Note: The response provided by PP by email on 3 December 2012 could be included with further explanation in the middle column.)	Calculations of Production values for 11-12 of April have been submitted and proved by scans from logbooks.	The calculations have been checked and it is confirmed that the reported value in the log books is 100% of nitric acid productions. The values have been further cross-checked with the monthly reports /19/. CL 1 is closed.
CL 2	Most of the Nitric acid production values that are reported in the historical, baseline and project campaign data sheets; do not exactly match with the production records available on site. It has been stated that the values are rounded down and the plant also produces liquid fertilizer resulting in some of the reported values being different than the one in the production logs. DNV was OK in general with this discrepancy since the reported values that did not match with the recorded values were always lower; however this needs to be clarified further.	The nitric acid production values that are reported in the initial versions of the historical, baseline and project campaigns data sheets were from financial records. All the nitric acid production is calculated on the base of tank levels and stock values, but since there is not an automated measuring system for the nitric acid production the values recorded in financial reports are always rounded down to secure conservativeness of accounting. However, the updated historical, baseline and project campaigns data sheets are now based on the production logs from the plant.	The values in the updated version of the data sheets /3/ have been verified with the production logs and found to be correct. DNV agrees with the updates since the values should be based on the production logs as per the PDD requirements and not on the financial records /26/. Further, the values have been cross checked with the monthly reports /19/. CL 2 is closed.

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 3	By checking the actual readings during the on-site audit and the daily reports for AMS, it was found out that higher N_2O concentrations (around 4 500 mg/m^3) are being emitted by the plant. One of the reasons provided for these higher emissions was that after removing one of the three reactors (reactor 'A' on 15 November 2012) by-pass occurred in the remaining two reactors. It is not clear how the removal of one reactor and the by-bass in the other two reactors are linked and thus this needs to be clarified. Further it needs to be clarified that the higher values being recorded are within the measurement range of the analyser.	1. The metallic structure of the catalyst basket was damaged and separated from the sieve in several points. This leads to catalyst fall from some of the compartments and for this reason, a part of gas-flow doesn't pass through the catalyst. There is no link between the removal of the reactor and the damage that occurs in one of the 2 remaining reactors. It was just a coincidence. 2. The measurement range of the analyser configured by ABB and AFRISO it's 0 - 4900 mg/m^3 N_2O. So the actual readings near 4500 mg/m^3 N_2O are within the Measurement Range and can be used in calculation of ER.	DNV finds the explanation given reasonable and thus acceptable. The measurement range of the anlyzer has been confirmed to be 0 - 4900 mg/m^3 N_2O during site visit and from the QAL 2 report /10/; and thus the values monitored are within the measurement range. The processed data that are finally used for ER calculations (after using 95% confident interval and AMS downtime) are all within the monitoring range. CL 3 is closed.
CL 4	It has been stated that the monitoring period that ends now on 21 November 2012 might be extended to 31 December 2012 by adding data from 21 November 2012 until 31 December 2012 and providing evidences to support the data. In order for DNV to conclude this verification, it needs to be clarified whether the monitoring period will be extended to the end of 2012 or not.	It was decided, to secure the issuance of ERUs, to conclude verification as soon as it is possible and take in account emission reductions until 3 December 2012.	The updated emission reduction calculation spreadsheet ending 3 December 2012 along with updated MR has been provided to DNV /1//3/. It should be noted that since the campaign is still on-going at the end of the monitoring period, the stack gas data includes values from 4 December as well. However NAP has been used only up to 3 December 2012. Which is considered conservative towards emission reductions and thus acceptable by DNV. CL 4 is closed.

CL ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 5	FAR 5 from determination was related to meeting the compliance with the NO_x requirements. As per the PDD the period for the implementation of NO_x reduction measures ends on 31 December 31 2012. The plan of action is included in the IPPC permit (mentioned in the PDD) which is valid until 31 December 2014. In accordance with this document Chemgas should reduce NOx emissions to 300 mg/m^3. However, as per the updated IPPC permit, Chemgas should reduce NOx emissions to 185 mg/m^3 by 1 January 2013. DNV has further checked the design documents for the DeNOx reactor (physically inspected the installed reactor during site visit) and the contract for the supply of DeNOx catalyst O4-89 which was updated on 20 October 2011. The DeNOx catalyst O4-89 contract confirms that the NOx emissions will be reduced to 200 ppm (about 400 mg/m^3). DNV is not clear how the NOx compliance as per the IPPC permit will be met (185 mg/m^3 by 1 January 2013).	On the base of our experience in another InterAgro plant (DonauChem) we can expect that the performance of DeNOx system is better than it is guaranteed by agreement. The NOx emissions in DonauChem that has the same plant design and the same DeNOx system are lower than 185 mg/m3. If after DeNOx installation NOx emissions will not comply with Environmental Permit requirement additional actions will be carried out.	During site visit of 28 November 2012 for Donauchem 3rd verification lower than 185 mg/m^3 NOx values were observed by DNV. Since similar warranties (200 ppm) were provided by Steuler for Donauchem DeNOx system /6/ and the two plants designs are the same and the tail gas volume flows are similar. , DNV is of the opinion that it is expected that Chemgas will comply with the NOx limit when the DeNOx system is implemented (expected to be implemented in next shutdown by the end of this year). Moreover, since it has been stated that additional actions will be carried out if NOx limit is not met, DNV find the response provided by the client to be reasonable. CL 5 is closed.

Forward action requests from Determination

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR 1	The LoAs should be submitted to AIE at least at the moment at the first periodic verification.	LoA have been submitted during first verification.	The LoA from the host country Romania dated 14 May 2012 and Sweden dated 24 September 2012 /23/ /24/ have been provided to DNV. FAR 1 is closed.

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR 2	During the on-site visit the quality assurance and quality control procedure have been discussed while TÜV SÜD assessment team underlined the importance of such procedures for the future data quality. The project proponents provided a draft version of a so called "JI Manual" - Procedure PO-231-01 – (IRL 34) - which comprises description of the work scope as well as tasks of responsible personnel. The project manager agreed to amend the existing JI Manual by including further information on qualification requirements and continuous training for responsible staff, procedures on the data treatment acc. to AM0034 rules and requirements (e.g. downtime of AMS), QAL 3 procedures, JI project related documentation procedures, troubleshooting procedures, list of the spare equipment, provisions for the data quality in case of data recording in the hand written logbooks and manual data transfer etc. During the first periodic verification the PPs will provide the JI Manual to a verifying entity.	The updated JI Manual has been submitted during first verification.	The updated JI manual has been provided to DNV /7/. FAR 1 is closed.

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR 3	The offer from the secondary catalyst supplier BASF was available to the audit team and confirms the warranted abatement efficiency and costs of the secondary catalyst. The contract with the catalyst supplier will be checked at the first periodic verification.	The contracts have been submitted during first verification.	The secondary catalyst contract with BASF dated 8 August 2011 has been provided /14/ and verified by DNV. FAR 3 is closed.
FAR 4	The updated plant's Environmental Permit IPPC has to be presented to the verifier at the first periodic verification	The IPPC permit has been submitted during first verification.	The IPPC permit has been provided to DNV. FAR 4 is closed.
FAR 5	The plant's compliance with the NOx requirements has to be verified at the first periodic verification.	The correspondent information has been submitted during first verification.	Refer to CL 5 for details. It is anticipated that the plant will comply with the NOx requirements by the due date of 1 January 2013 as required by the IPPC permit /5/. FAR 5 is closed.
FAR 6	Complete information regarding normal operating conditions (the normal OT, OP, AFR, AIFR, GS and GC) shall be provided during the first verification.	The calculations of normal operational parameters have been submitted during first verification.	Complete information regarding normal operating conditions (the normal OT, OP, AFR, AIFR, GS and GC) have been provided and verified by DNV in this verification /2//3/. It is DNV's understanding as per the determination report /27/ that OP_{normal} was verified from the plant manual so no further verification of OP_{normal} was conducted in this first verification. FAR 6 is closed.

Forward action requests from this verification

FAR ID	Forward action request	Response by Project Participants	DNV's assessment of response by Project Participants
FAR 1	--	--	---

No FAR was raised in this verification.

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