DETERMINATION REPORT

JOINT IMPLEMENTATION PROJECT AIMED AT N2O EMISSIONS REDUCTION BY INSTALLATION OF SECONDARY CATALYST INSIDE AMMONIA OXIDATION REACTORS AT 3 NITRIC ACID PRODUCTION PLANTS NA2, NA3 AND NA4 OF AZOMURES SA COMPANY, SITUATED AT TÂRGU MURES, ROMANIA.

REPORT NO. 2009-1241

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DET NORSKE VERITAS

DETERMINATION REPORT

DET NORSKE VERITAS
CERTIFICATION AS

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Client: S.C. Azomures S.A.	Client ref.: Daniel Domanovsky

Project Name: Joint Implementation project aimed at N2O emissions reduction by installation of secondary catalyst inside ammonia oxidation reactors at 3 nitric acid production plants NA2, NA3 and NA4 of Azomures SA company, situated at Târgu Mures, Romania.
Country: Romania
GHG reducing Measure/Technology: "Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants"
ER estimate: 1 821 595 t CO_2e/year (average)
Size
☒ Large Scale
☐ Small Scale
Determination Phases:
☒ Desk Review
☒ Follow up interviews
☒ Resolution of outstanding issues
Determination Status
☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

In summary, it is Det Norske Veritas Certification AS' opinion that the "Joint Implementation project aimed at N_2O emissions reduction by installation of secondary catalyst inside ammonia oxidation reactors at 3 nitric acid production plants NA2, NA3 and NA4 of Azomures SA company, situated at Târgu Mures, Romania", as described in the PDD version 1.6 of 17 August 2010, meets all relevant UNFCCC requirements for the JI. Hence, DNV requests the registration of the ''Joint Implementation project aimed at N2O emissions reduction by installation of secondary catalyst inside ammonia oxidation reactors at 3 nitric acid production plants NA2, NA3 and NA4 of Azomures SA company, situated at Târgu Mures, Romania'' as track 2 JI project activity.

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Report title:
Joint Implementation project aimed at N_2O emissions reduction by installation of secondary catalyst inside ammonia oxidation reactors at 3 nitric acid production plants NA2, NA3 and NA4 of Azomures SA company, situated at Târgu Mures, Romania.

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Key words:
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Abbreviations

AIE	Accredited Independent Entity
AMS	Automated Measuring System
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
EFMA	European Fertilizer Manufacturers Association
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
IPPC	Integrated Pollution Prevention Control
JI	Joint Implementation
MP	Monitoring Plan
N_2O	Nitrous oxide
NAP	Nitric Acid Plant
NGO	Non-governmental Organisation
NPV	Net Present Value
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

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1 EXECUTIVE SUMMARY – DETERMINATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a determination of the "Joint Implementation project aimed at N_2O emissions reduction by installation of secondary catalyst inside ammonia oxidation reactors at 3 nitric acid production plants NA2, NA3 and NA4 of Azomures SA company, situated at Târgu Mures, Romania". The determination was performed on the basis of UNFCCC criteria for Joint Implementation as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is Romania, and the sponsor Party is France. Romania and France both meet the requirements to participate in the JI. The designated focal point of Romania has issued a Letter of Approval (LoA) on 10 May 2010, authorizing Azomures SA as a project participant. The project title in the LoA is slightly different from the PDD but DNV finds that it is clear that the LoA concerns the proposed JI project. The designated focal point of France has issued the LoA on 18 June 2010, authorizing Vertis Environmental Finance Ltd as project participant.

By the destruction of nitrous oxide (N_2O) that would otherwise be released into the atmosphere in absence of the project activity, the project activity results in emission reductions that are real, measurable and give long-term benefits to the mitigation of climate change.

The baseline has been determined in accordance with the approved CDM baseline methodology AM0034 version 03 "Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants". DNV has validated the permitted ranges for the operation of the ammonia oxidation reactors. However the verification of the baseline emission factors and the normal campaign lengths are not included in the scope of the determination and will be finally verified by the verifying AIE during the verification of the first monitoring period. Preliminary compiled data for the baseline campaigns were provided during the determination in order to check that data used for estimation of emissions reductions were reasonable. Adjustments to AM0034 will be made for the calculation of the baseline emission factor for plant NA 4 where overlapping data from two consecutive campaigns will be used. The total produced nitric acid during the baseline measurements from these two campaigns was approx. 216 ktonnes of 100% nitric acid. The average campaign length for plant N4 (based on historical campaign data) is 276 ktonnes of 100% nitric acid. The preliminary data provided to DNV shows N_2O concentrations in the same range for the two campaigns. The measurements from the two overlapping campaigns are regarded sufficient for the determination of the baseline emission factor and the approach is reasonable. The average length in time for a normal campaign for plant NA4 is 17 months, meaning a complete baseline campaign would delay the start of emissions reduction with approximately one year if the overlapping campaigns approach was not applied. Further the normal campaigns length is determined from 4 historical campaigns since prior to this time a data reporting system was not in place thus monitoring data was not available for 5 previous campaigns. The justification for using 4 campaigns is reasonable and it is regarded sufficient to determine the normal campaign lengths from 4 campaigns.

Moreover, as a further deviation from AM0034, the project allows for using various compositions of primary oxidation catalyst in the project campaigns during the project lifetime. In case the project owner changes the composition of the catalyst (from the one used during the baseline campaigns), it shall be demonstrated, that this flexibility is motivated by sound operational and economic reasons. The project owner will provide to the verifier statement from primary catalysts suppliers on the impact of the specific primary catalysts on N_2O formation. In case of a material decrease in generation of N_2O or lack of evidences to demonstrate the effect on N_2O formation, the baseline campaign needs to be repeated or a conservative default factor applied. This approach is regarded reasonable.

It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 1 821 595 tCO_2e per year (based on the crediting period of 4 years and 6 month)[1]. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented. The project is not expected to have significant environmental impacts. According to the actual Romanian environmental legislation the environmental impact assessment and environmental expertise endorsement is not required for the considered project.

In summary, it is DNV's opinion that the "Joint Implementation project aimed at N_2O emissions reduction by installation of secondary catalyst inside ammonia oxidation reactors at 3 nitric acid production plants NA2, NA3 and NA4 of Azomures SA company, situated at Târgu Mures, Romania" as described in the PDD version 1.6 of 17 August 2010, meets all relevant UNFCCC requirements for the JI and all relevant host party criteria.

The following issues are defined as forward actions that shall be addressed by the verifying AIE during the first verification:

[1] The project crediting period is from 24 July 2008 (the first installation of secondary catalyst in NA3) to) till 31 December 2012. The total estimated emissions for the entire crediting period is 8 197 176 tCO_2e.

FAR ID	Forward action request
FAR 1	Preliminary compiled baseline data has been provided and used for estimation of baseline emissions factors and emissions reductions. However the baseline emissions factors shall be finally verified by the verifying AIE during the verification of the first monitoring period. In case of failure to get the baseline emissions factor verified the project will use the IPCC default emission factor of 4.5 $kgN_2O/tHNO_3$ (100%), if this factor is lower than the factor resulting from actual measurements. /1/
FAR 2	Verification of normal campaign lengths is not included in the scope of the determination and shall be finally verified by the verifying AIE during the verification of the first monitoring period.
FAR 3	Calibration gas for N_2O: It was observed that a calibration gas with an incorrect concentration (761 ppmv) was used from July 2007 to Feb. 2008. The QAL 2 report includes a correction factor that shall be applied for the period where the incorrect calibration gas was used. This needs to be verified by the verifying AIE during the verification of the baseline emission factors during the first monitoring period.

2 INTRODUCTION

S.C. Azomures S.A.has commissioned Det Norske Veritas Certification AS (DNV) to perform a determination of the "Joint Implementation project aimed at N_2O emissions reduction by installation of secondary catalyst inside ammonia oxidation reactors at 3 nitric acid production plants NA2, NA3 and NA4 of Azomures SA company, situated at Târgu Mures, Romania (hereafter called "the project").

This report summarises the findings of the determination of the project, performed on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the Guidelines for the implementation of Article 6 of the Kyoto Protocol and the subsequent decisions by the JI Supervisory Committee.

2.1 Objective

The purpose of a determination is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Determination is a requirement for all JI projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reduction units (ERUs).

2.2 Scope

The determination scope is defined as an independent and objective review of the project design document and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The determination is not meant to provide any consulting towards the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

3 METHODOLOGY

The determination consisted of the following three phases:

I a desk review of the project design document

II follow-up interviews with project stakeholders

III the resolution of outstanding issues and the issuance of the final determination report and opinion.

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

The following table outlines the documentation reviewed during the determination:

/1/ Vertis Environmental Finance Zrt.: *Project design document for the " Joint Implementation project aimed at N_2O emissions reduction by installation of secondary catalyst inside ammonia oxidation reactors at 3 nitric acid production plants NA2, NA3 and NA4 of Azomures SA company, situated at Târgu Mures, Romania"*, version 1, dated April 2008.
Vertis Environmental Finance Kft.: *Project design document for the " Joint Implementation project aimed at N_2O emissions reduction by installation of secondary catalyst inside ammonia oxidation reactors at 3 nitric acid production plants NA2, NA3 and NA4 of Azomures SA company, situated at Târgu Mures, Romania"*, version 1.6 dated 17 August 2010.

/2/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/3/ CDM-EB: *Approved Baseline and Monitoring Methodology AM0034 - "Catalytic reduction of N_2O inside the ammonia burner of nitric acid plants"*, Version 03

/4/ CDM-EB: *Approved Baseline and Monitoring Methodology AM0028 - "Catalytic N2O destruction in the tail gas of Nitric Acid or Caprolactam Production Plants"*, Version 4.1

/5/ CDM-EB: *Tool for the demonstration and assessment of additionality* Version 04

/6/ UNFCCC: *Decision 9/CMP1 Guidelines for the implementation of Article 6 of the Kyoto Protocol* 30 March 2006

/7/ UNFCCC: *Decision 9/CMP1 APPENDIX B Criteria for baseline setting and monitoring to Guidelines for the implementation of Article 6 of the Kyoto Protocol* 30 March 2006

/9/ The Ministry of Environment and Permanent development of Romania: *Letter of Endorsement*, No. 375, 7 February 2008.

/10/ Project Idea Note: N_2O abatement project at Azomures SA. December 2007

/11/ Contract for JI development between the parties Azomures SA and Vertis Environmental Finance Zrt., dated 29 September 2006

/12/ QAL1 suitability test report for the stack gas flow meter DURAG D-FL 100. Report-#. 128CU11650 dated 29.03.1996, TÜV North

/13/ Environment S.A: QAL 1 suitability for N_2O analyzer MIR 9000 in accordance with EN ISO14956. Dated 17 March 2008.

/14/ Airtech GmbH: Calibration report according to EN14181 Plant N2. Date of test 5 to 8 February 2008. Date of report 22 January 2009 (QAL2)

/15/ Airtech GmbH: Calibration report according to EN14181 Plant N3. Date of test 9 to 11 July 2008. Date of report 22 January 2009 (QAL2)

/16/ Airtech GmbH: Calibration report according to EN14181 Plant N4. Date of test 25 to 28 February 2008. Date of report 22 January 2009 (QAL2)

/17/ Azomures SA: "The monitoring of the N_2O emissions from the nitric acid plant". Quality assurance manual. The validation of the monitoring of the data according to QAL 3 under EN 14181"

/18/ TecnoInstrument: Training records for Azomures personnel for stack gas flow meter DFL-100.

/19/ BASF Chemical Company: "Impact of secondary N_2O abatement catalyst of ammonia efficiency – Azomures JI Project". Letter dated 10 July 2008.

/20/ BASF Chemical Company: Supply agreement for N_2O secondary abatement catalyst. 5 May 2008.

/21/ Environment S.A: Training records for Azomures personnel for Multi-gas Infra-Red GFC Analyzer MIR 9000 (N_2O analyzer).

/22/ IPPC permit issued by Agentia Regionala Pentru Protectia Mediului Sibiu (Agency for Environmental Protection Sibiu). Nr. 4598/30.10.2007. Limits for NOx emissions. Valid until 31.12.2015

/23/ TüV Nord: EN-ISO 9001:2000 Certificate. Dated 25 June 2008. Valid until 24 June 2011.

/24/ TüV Nord: EN-ISO 14001:2000 Certificate. Dated 20 June 2008. Valid until 19 June 2011.

/25/ W.C. Heraeus GmbH: "Hereaus FTC*Plus*-systems/Confirmation. Letter dated 24 July 2008.

/26/ W.C. Heraeus GmbH: Specification of Primary catalyst gauzed system used by Azomures Acid IV plant (4 reactors). FTC*Plus*-system.

/27/ Ministerual Industriei Chmce Centrala Industriala Târgu Mures: Nameplate capacities: for N2, N3 and N4 nitric acid plants.
NA2 dated 14.10 1987: 725 metric tonnes 100% HNO_3 per day
NA3 dated 23.07 1987: 725 metric tonnes 100% HNO_3 per day
NA4 dated 23.07 1987: 750 metric tonnes 100% HNO_3 per day
The exact template capacity is available from supplier contracts as follows:
NA2 contract April 1966 no. 6221002: 241 425 100% HNO_3 per year.
NA3: Grand Paroisse: 240 000 100% HNO_3 per year
NA4: Ministerul Industriei Chimice Institutul de Proiectari Pentru Industria Chimica Anorganica si a ingrasamintelor IPRAN: 750 tonnes 100% HNO_3 per day.

/28/ Operation Manual Azomures Coe no.(source for permitted operating ranges):
IL-41-019 Nitric acid II
IL-41-023 Nitric acid III
IL-41-027 Nitric acid IV

/29/ Azomures: "Description of collection data system. Recording and printing procedures."

/30/ Azomures: Excel sheet: Azomures_baseline_costs_estimates_v6.xls

/31/ Sibiu local environmental agency: Declaration dated 16.07.2008. Approval of project.

/32/ Azomures Excel sheet: Preliminary determination of normal campaign lengths, CL_{normal}. (file Campaign_length_v2.xls)

/33/ Azomures: Excel sheet: Preliminary baseline campaign data.

/34/ Invoices: N_2O analyser and data logger.

/35/ Azomures: Excel sheet: Copy of Azomures_Campaigns_Catalysts.xls

/36/ Azomures: Description of data storage

/37/ Deutscher AkkreditierungsRat: DIN EN ISO/IEC1 7025:200 accreditation of AIRTEC Gesellschaft für Umweltmessungen mbH. Valid from 2 April 2007 to 1 April 2012.

/38/ Letter of Approval (LoA) authorizing Azomures SA as a project participant by the Ministry of Environment and Forests, Romania, dated 10 May 2010

/39/ Letter of Approval (LoA) by the Ministère de l'Écologie, de l'Énergie, du Développement Durable et de la Mer, en charge des Technologies vertes et des Négociations sur le climat dated 18 June 2010.

Main changes between the PDD version published for the 30 days stakeholder commenting period and the final version:

- In PDD Sects. A.4.2 Description of plant. Information updated according to documentation reviewed at the site visit. Campaign lengths were updated due to errors in calculation of nitric acid produced during 4 historical campaigns.
- In PDD Sect. A.4.3.4, Estimated amount of emission reductions over the crediting period is updated according to preliminary compiled data for the baseline campaigns
- In PDD Sect. B.1, additional information about NOx emissions and N_2O abatement projects in Romania
- In PDD Sect.B.1, additional information about the baseline campaigns used to calculate the baseline emission factors.
- In PDD Sect. B.2, information regarding cost of implementation of the projects activity and the expected revenue from sale of ERUs
- In PDD Sect. D.1.1.1, updated information about data archiving and source of data
- In PDD Sect. D.1.1.4 permitted operation data updated to be in accordance to operational manual as verified at the site visit and updated information about the use of primary ammonia oxidation catalyst during the project lifetime
- in PDD Sect. E: Updated estimation of emission reductions based on abatement efficiency observed after installation of secondary catalyst
- in PDD Annex 2: Updated baseline information

3.2 Follow-up Interviews with Project Stakeholders

Date	Name	Organization	Topic
12 June 2008	Daniel Domanovsky	Vertis Environmental Finance	• Project activity • Legal requirements for nitric acid plants in Lithuania

Aurel Popa Development Director	Azomures	• Technology employed • Evidence to demonstrate additionality of the project • Monitoring plan • Ammonia oxidation primary catalyst information • Permitted operating conditions and baseline campaign data • Ex-ante emission reduction estimation • Environmental licenses and legal compliance • Stakeholders consultation process • Management system
Ioan Soleriu Technical Director	Azomures	
Dudici Mircea Manager of Instrumentation	Azomures	
Oltean Ioam Analyzer system manager	Azomures	

3.3 Resolution of Outstanding Issues

The objective of this phase of the determination was to resolve any outstanding issues which need be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a determination protocol was customised for the project. The protocol shows in transparent manner criteria (requirements), means of verification and the results from validating the identified criteria. The determination protocol serves the following purposes:

- It organises, details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent determination process where the AIE will document how a particular requirement has been validated and the result of the determination.

The determination protocol consists of three tables. The different columns in these tables are described in the figure below. The completed determination protocol for "*Joint Implementation project aimed at N_2O emissions reduction by installation of secondary catalyst inside ammonia oxidation reactors at 3 nitric acid production plants NA2, NA3 and NA4 of Azomures SA company, situated at Târgu Mures, Romania*" is enclosed in Appendix A to this report.

Findings established during the determination can either be seen as a non-fulfilment of JI criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

i) mistakes have been made with a direct influence on project results;
ii) JI and/or methodology specific requirements have not been met; or
iii) there is a risk that the project would not be accepted as a JI project or that emission reductions will not be issued.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

Determination Protocol Table 1: Mandatory Requirements for JI Project Activities		
Requirement	***Reference***	***Conclusion***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*

Determination Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 01 - in effect as of: 15 June 2006. Each section is then further sub-divided.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a c**orrective action request (CAR)** due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the determination team has identified a need for further clarification.*

Determination Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Determination conclusion***
If the conclusions from the draft Determination are either a CAR or a CL, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the CAR or CL is explained.*	*The responses given by the project participants during the communications with the determination team should be summarised in this section.*	*This section should summarise the determination team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Determination protocol tables

3.4 Internal Quality Control

The determination report underwent a technical review. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM/JI validation/determination and verification for a specific methodology/sector group of methodologies.

3.5 Determination Team

Role/ Qualification	***Last Name***	***First Name***	***Country***	***Type of involvement***					
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
Project manager/ Sector Expert/ Methodology expert/ Technical team leader	Kopperud	Trine	Norway	x	x	x	x		x
JI validator	Lehmann	Michael	Norway	x		x			
Technical reviewer	Khawaja	Rafi-ud-Din	Norway					x	

4 DETERMINATION FINDINGS

The findings of the determination are stated in the following sections. The determination criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the determination protocol in Appendix A.

4.1 Participation Requirements

The project participant from the host Party is Azomures SA. Romania ratified the Kyoto Protocol on 19 March 2001. Romania has designated a focal point and has submitted its national guidelines and procedures for the approval of JI projects. Romania thus fulfils the, participation requirements (Marrakech Accords, JI Modalities, §20). The designated focal point of Romania has issued a Letter of Approval (LoA) on 10 May 2010 authorizing Azomures SA as a project participant /38/. The project participant from the investor Party is Vertis Environmental Finance Ltd. The designated focal point of France issued the LoA 18 June 2010 and authorized Vertis Environmental Finance Ltd as project participant /39/.

4.2 Project Design

The purpose of this project is the reduction of nitrous oxide (N_2O) emissions from the three nitric acid plants (NA2, NA3 and NA4) at Azomures SA.

N_2O formation is a result of unwanted chemical reactions that take place during the catalytic oxidation of ammonia which is the first stage in the nitric acid production process. Some part of the N_2O is destroyed already in the ammonia oxidation reactor, while the non destroyed N_2O is emitted with the tail gases. N_2O is a high potential greenhouse gas with a green house warming potential (GWP) of 310.

The project involves the installation of a secondary N_2O reduction catalyst underneath the primary precious metal catalyst and catchments gauzes package in each of the three ammonia oxidation burners in nitric acid plant NA2 and in each of the four ammonia oxidation burners in NA3 and NA4.

The secondary catalyst will be placed in the appropriate support structure. The gap between the edge of the support structure and inside wall of the ammonia burner will be sealed to prevent the process gas by-passing the secondary catalyst. In this way the technology will ensure that all gases which pass through the primary catalyst also will pass through the secondary catalyst.

According to major secondary catalyst suppliers, the installation of the secondary catalysts will result in approximately 70% -95% reduction of the N_2O content in the tail gas. The supplier of the secondary catalyst is BASF, and the contract for the catalyst by BASF is stating that the efficiency of the catalyst will be more than 82%. The abatement efficiency used to estimate the emissions reduction is based on preliminary observations after the installation of the secondary abatement catalyst. The abatement efficiencies observed is in the range of approx. 80% for NA4 and approx. 92% for NA2 and NA3.

Azomures production lines are dual pressure nitric acid plants operating at 2.6-4 barg ammonia oxidation pressure and 8 bar absorption pressure. Nameplate capacity for the plants is in total 2200 metric tons of nitric acid per day (725 metric tons per day in NA2 and NA3, and 750 metric tons per day in NA4) /27/. The annual template design capacity is as follows:

NA2: 241 425 tonnes 100% nitric acid
NA3: 240 000 tonnes 100% nitric acid
NA4: 247 500 tonnes 100% nitric acid

This corresponds to total production of 728 025 tons nitric acid per year

The normal length of the primary catalyst campaign in the ammonia oxidation reactors are based on the average length of 4 previous campaigns, which is determined to be 261 ktonnes HNO_3 for NA2, 287 ktonnes HNO_3 for NA3 and 276 ktonnes HNO_3 for NA4. The reason for not using 5 campaigns as stated by AM0034 is that prior to the 4 previous campaigns a data reporting system was not in place and thus data not available prior to 2001. The justification for using 4 campaigns is reasonable and sufficient to determine a normal campaign length.

The project crediting period is selected to be 24 July 2008 (the first installation of secondary catalyst in NA3) till 31 December 2012. The project start date is 20 September 2006, when an official decision to proceed with the project was made /11/. The project is expected to operate beyond 31 December 2012.

4.3 Baseline Determination

The baseline determination of the project is based on the approved CDM methodology AM0034. The project meets the conditions of the applicability of AM0034/Version 03 as follows:

- *Limited to the existing production capacity, where the commercial production had began no later than 31 December 2005*: the Azomures SA nitric acid plants started the commercial operation in 1968, 1974 and 1978 for NA2, NA3 and NA4, respectively. The design capacity is 725 tonnes HNO_3 per day for NA2 and N3 and 750 tonnes HNO_3 per day for NA4. /27/
- *The project activity will not result in the shut down of any existing N_2O destruction facility in the plant:* Azomures SA currently has no N_2O destruction facility installed.
- *The project activity shall not affect the level of nitric acid production:* The project activity will decompose N_2O by the use of a secondary catalyst and the level of nitric acid production is not expected to be affected. /19/
- *There are currently no regulatory requirements or incentives to reduce levels of N_2O emissions from nitric acid plants in the host country:* There are currently no regulatory requirements or incentives to reduce N_2O emissions from nitric acid plants in Romania. Limits for emission of N_2O are not included in the IPPC permit /22/.
- *No N_2O abatement technology is currently installed in the plant:* No N_2O abatement technology is installed.
- *The project activity will not increase NO_X emissions:* The N_2O destruction process by the use of a secondary catalyst technology does not increase the level of NO_X emissions.
- *NO_X abatement catalyst installed, if any, prior to the start of the project activity is not a Non-Selective Catalyst Reduction (NSCR) DeNO_X unit:* Azomures SA has installed Rhodia Selective Catalyst Reduction (SCR) De-NO_x units in the three production lines.

- *Operation of the secondary N_2O abatement catalyst installed under the project activity does not lead to any process emissions of greenhouse gases, directly or indirectly:* The secondary catalyst system does not consume any additional energy, e.g. power, steam or compressed air.
- *Continuous real-time measurements of N_2O concentration and total gas volume flow can be carried out in the stack:* The N_2O concentration and gas volume flow is to be measured by three separate sets of monitoring equipment. The baseline campaigns were as follows:

  NA2: Started July 2007; finalised October 2008
  NA3: Started March 2007; finalised July 2008
  NA4: The baseline emission factor will be determined from two campaigns as follows:
  Campaign 1: Started 26 September 2006 and ended 9 March 2008
  Campaign 2: Started 15 March 2008, the secondary catalyst was installed 11 August 2008 (this campaign is still operating).
  The monitoring equipment was installed in April 2007, the monitoring started in July 2007.
  Hence the period to be used to determine the baseline emission factor for NA4 is from 16 July 2007 to 11 August 2008. The total production of nitric acid was 216 ktonnes of 100% nitric acid during the two campaigns. The normal campaign as determined from 4 historical campaigns was 276 ktonnes HNO_3. The baseline campaign arriving from the two overlapping campaigns is about 20% shorter than the normal campaign (in terms of tonnes of nitric acid), measured in time the baseline campaign is approx 13 months (approx. 8 months from campaign 1 and approx. 5 months from campaign 2) compared to average length of 17 months for historic campaign. However the baseline data available[2] is regarded sufficient in order to determine a baseline emission factor for N4. Further the N_2O concentration from baseline campaign 1 is not significantly higher than the measurements from campaign 2 although the data from campaign 1 is taken from the latter part of the campaign (normally the N_2O concentration is showing an increasingly higher N_2O emissions at the end of the campaign, this is only visible for about 2 weeks in this case, taking into account a standard deviation of 375 ppm the two data set is regarded to be in the same range). Hence, since the measurements indicate that there is no significant variation of N_2O emissions over the campaign, the approach of using overlapping campaigns is found acceptable even though the total length of the period to be used to determine the baseline emission factor for NA4 is shorter than then historic campaigns.

All applicability criteria of AM0034/version 03 are fulfilled.

The baseline scenario was identified using the procedure for "Identification of baseline scenario" described in the approved methodology "Catalytic N_2O destruction in the tail gas of Nitric Acid Plants" AM0028 v.4.1 as referred to in AM0034. The methodology application first involves an identification of possible baseline scenarios, and then the elimination of the ones that are not plausible. As a result, the only feasible baseline was found to be the continuation of the status quo, which meets current regulations and requires neither additional investments nor additional running costs. It was verified from the IPPC permit that abatement

[2] Preliminary compiled baseline data were provided to DNV in August 2009 and thus after the site visit performed by DNV in June 2008. The verification of baseline data is not included in the scope of determination and thus subject to be verified by the verifying AIE,

of N_2O is not required /22/. Further, the Azomures plant has installed selective catalyst reduction (SCR) system in all three plants which reduces NO_x emission level below the limits of 500 mg/Nm^3 established by Azomures' IPPC permit. It was observed during the site visit that the NOx emissions were in the range from 70 -150 ppmv. A tertiary N_2O abatement technology is thus not a feasible option. Therefore, the continuation of the current situation is selected as the baseline scenario. The explanation of methodological choices for determining the baseline is clearly described in the PDD.

The baseline emission factors (kg N_2O/tonne HNO_3) is determined from the preliminary compiled data available for continuous measurements of N_2O concentration and volume flow in the stack gas.

To assure that the data obtained during the baseline campaigns are representative for the actual GHG emissions from the source plant, a set of process parameters known to affect N_2O generation (that are under the control of the plant operator) shall be defined as required according to AM0034. These "permitted operating ranges" are defined from the data available in the operating manuals for the three nitric acid plants /28/, as there was not enough detailed complete historical operational data available. This approach is in compliance with one of the options described in AM0034 for defining the permitted operating ranges.

The baseline campaigns, which will be used for setting the baseline, are using flow measurement and all necessary monitoring equipment is installed and in operation.

The PDD, Annex 2 contains an estimate of the baseline emissions factors representing the average N_2O emissions per tone of nitric acid and is based on data from the baseline campaigns mentioned above. The N_2O emission measurements from the baseline campaigns, the determination of the normal campaign lengths, and thus the actual baseline emissions factors to be used to determine the baseline emissions will however be subject to verification by the verifying AIE (see also 4.6).

4.4 Additionality

The project additionality is demonstrated by applying the "Tool for the demonstration and assessment of additionality" (version 04). The tool is used as a methodology for proving that the project is not economically attractive in the absence of JI benefits:

Step 1

Identification of alternatives to the project activity consistent with current laws and regulations: As suggested by the CDM methodology AM0028/Version 4.1 Step 1 has been omitted because section B.1 of the PDD for identifying and describing baseline scenario has already identified the continuation of the status quo as the only realistic alternative to the chosen project scenario, which is also consistent with mandatory laws and regulations of Romania.

Step 2

Investment analysis

As described in section B.1 of the PDD under "Identification of the baseline scenario", in the absence of the JI project, no installation of any equipment which would reduce N_2O emissions is the most likely baseline scenario. This means that there is no reduction of N_2O emissions, and N_2O emissions would remain at present level. There is no economic benefit for the installation of a nitrous oxide abatement system except for the revenue from the sale of

Emission Reduction Units (ERUs) within the JI framework. The project proponent has provided sufficient documentary evidences /20/, /34/ for the costs for the N_2O abatement catalyst and monitoring system. It is also shown that the revenue from ERUs is sufficient to cover these costs. /30/

Step 3

Barrier analysis

Step 3 was omitted as Step 2 was used to demonstrate the project's additionality.

Step 4

Common practice analysis

This step allows to double check the previous demonstration of the project additionality, demonstrating that besides being the only plausible alternative from a financial point of view the project is not common practise. There is one N_2O abatement project in Romania in addition to this project acitivity. However, this project is developed as a JI project activity as well.

It is not business as usual to install N_2O abatement systems. Further there is no legal obligation to install such a system, as Romanian law does not require any abatement of N_2O and the IPPC permit for Azomures SA plant does not require any abatement of N_2O /22/.

Taking into consideration the above, it is sufficiently demonstrated, that the project is not a likely baseline scenario and that emission reductions are thus additional.

4.5 Monitoring

N_2O is the only GHG indicator that is to be accounted for.

According to the methodology, all data for this indicator are on a project specific basis.

Documentation demonstrating compliance with all three levels of quality assurance as required by EN 14181 was made available and comprises the following:

QAL 1: Suitability of the AMS for the specific measuring task /12/ /13/

QAL 2: Validation of AMS following installation /14/-/16/

QAL 3: Ongoing quality assurance during operation /17/

QAL 1 suitability documents were provided and the QAL 2 tests, including measurements with a standard reference method, have been performed prior to finalisation of the baseline campaign /14-/16/. A laboratory which has an accredited quality assurance system according to EN ISO/IEC 17025 /37/ has been used to perform the QAL 2 tests, and the QAL 1 suitability test is according to ISO 14956.

The monitoring parameters, necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary and to monitor emissions from the project, are presented in Table D 1.1.3 and table D.1.1.1 of the PDD. This is in line with the methodology AM0034 / version 03.

Each production line represents a separate nitric acid production unit independent from each other. The tail gases from each line are after expansion turbines and vented through the stacks. Three separate sets of monitoring equipment are installed to measure tail gas flow, nitric acid production, nitric acid concentration, and the operating conditions. N_2O concentration in the tail gas is measured by MIR 9000 analyzers produced by Environment S.A., France.

Azomures SA has provided DNV with suitable records related to induction training of the monitoring equipment, control and operation personnel /21/. The monitoring plan (Annex 3) to the revised PDD reflects the JI guidelines (decision 9/CMP.1 appendix B Criteria for baseline setting and monitoring) and JI guidance to baseline setting and monitoring. The monitoring plan and the developed instruction document "*The monitoring of the N_2O emissions from the nitric acid plant. Quality assurance manual. The validation of the monitoring of the data according to QAL 3 under EN 14181*" /17/ includes the following requirements:

- The quality assurance and control procedures for the monitoring process including, as appropriate, information on calibration and on how records on data and/or method validity and accuracy are kept and made available on request;
- Clearly identify the responsibilities and the authority regarding the monitoring activities.

The PDD describes an automatic process for data monitoring, acquisition and archiving performed by the computer system. The responsibilities for final monitoring report preparation, quality assurance process and corrective actions for the N_2O abatement process and the monitoring system are sufficiently described in the instruction in the document Azomures SA: "*The monitoring of the N_2O emissions from the nitric acid plant. Quality assurance manual. The validation of the monitoring of the data according to QAL 3 under EN 14181*" /17/.

4.5.1 Parameters determined ex-ante

DNV has validated the permitted operating conditions and the correct implementation of the monitoring system for monitoring during the baseline campaign and the campaign after the installation of the N_2O abatement technology, but has not verified the data for the N_2O emissions during the baseline campaigns.

The following parameters are made available *ex-ante*:

- OT_{normal}: Normal operating temperature (determined from operational manual) /28/
- OP_{normal}: Normal operating pressure – (determined from operational manual) /28/
- AFR_{max}: maximum ammonia flow rate –(determined from operational manual) /28/
- $AIFR_{max}$: maximum ammonia to air ratio flow rate – (determined from operational manual) /28/
- CL_{normal}: Normal campaign length – historical data for the previous four campaigns
- GS_{normal}: Normal gauze supplier – historical data for the previous four campaigns
- GC_{normal}: Normal gauze composition – historical data for previous four campaigns

The normal campaigns lengths are determined from 4 historical campaigns since prior to this time a data reporting system was not in place and thus monitoring data for earlier campaigns were not available. The justification for using 4 campaigns is reasonable and it is regarded sufficient to determine a normal campaign length from 4 campaigns.

Details of the data collected, the frequency of data recording, its certainty, and format are described. The format for data archiving seems appropriate for the project. The data storage lengths are indicated in the PDD and are in accordance with AM0034. Data monitored and required for determination according to paragraph 37 of the JI guidelines are to be kept for

two years after the last transfer of ERUs for the project. The data storage length was amended to comply with this requirement.

The primary catalyst supplier and composition for historical campaigns and the baseline campaigns for all three lines have been provided. /35/

The catalyst composition can be summarised as follows:

	Plant NA2	Plant NA3	Plant NA4
Primary catalyst installed during historical campaigns	Pt/Rh 95/5 (4 campaigns)	Pt/Rh 95/5 (3 campaigns) Pt/Rh/Pd 84.16/4.61/11.2 (4th campaign)	Pt/Rh 95/5 (3 campaigns) Pt/Rh/Pd 58.46//3.89/37.65 (4th campaign)
Primary catalyst installed during baseline campaign	Heraeus FTCplus Pt/Rh/Pd 57.99/3.85/38.16	Pt/Rh/Pd 83.66/4.61/11.73	Campagn No. 1 FTCplus Pt/Rh/Pd 57.56/3.89//37.65 Campagn No. 2 FTC plus Pt/Rh/Pd 57.54//3.83/38.63

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 catalyst used in the baseline campaign in NA2 is not the same as the one used in the historical campaigns, however the FTCplus catalyst from Heraeus is a catalyst type used by the nitric acid producers and can be regarded common practice. Further a statement from Heraeus has been provided stating that there is no increase of N_2O when applying FTCplus catalyst and no impact on the production of nitric acid /25/.

4.5.2 Parameters determined ex-post

The monitoring plan allows for collection and archiving of the following key parameters related to the determination of emission reductions resulting from the project activity:

- $NCSG_{BC}$: N_2O concentration in stack gas. Measured continuously and recorded every 2 seconds during the baseline campaign. Measured by MIR 9000 analyzer.
- VSG_{BC}: Volume flow rate of the stack gas. Measured continuously and recorded every 2 seconds. Measured by gas flow meter DURAG D-FL 100.
- OH_{BC}: Operating hours. Recorded daily and compiled for entire campaign.
- NAP_{BC}: Nitric acid produced during baseline campaign. Recorded daily and compiled for entire campaign.
- TSG_{BC}: Temperature of the flow gas at stack during the baseline campaign. Recorded every 2 seconds.

- PSG_{BC}: Pressure of the flow gas at each stack during the baseline campaign. Recorded every 2 seconds.
- EF_{BL}: Baseline emission factor. Calculated once after the baseline campaign based on measurements of the nitric acid production, stack gas flow rate, N_2O concentration, and the operating hours. Calculated by the following equation. $EF_{BL} = (BE_{BC} / NAP_{BC}) / (1 - UNC/100)$. It is to be verified by the verifying AIE.
- UNC: Overall measurement uncertainty of the monitoring system calculated as the combined uncertainty of the flow meter, the uncertainty of the N_2O concentration measurements, using the law of propagation of uncertainty. Calculated from the specification of the measurement equipment. The uncertainty obtained from QAL2 test will be used. UNC has to be verified by the verifying AIE.
- AFR: Ammonia gas flow rate to the AOR. Continuously measured.
- AIFR: Ammonia to air ratio. Calculated from ammonia gas flow and air flow to AOR.
- CL_{BL}: Length of the baseline campaign. Calculated after the end of the campaign. Recorded daily and compiled for entire campaign.
- OT_h: Oxidation temperature for each hour. Monitored every hour.
- OP_h: Oxidation pressure for each hour. Monitored very hour.
- GS_{BL}: Gauze supplier for baseline campaign. Monitored once. Supplier's contract or invoice is available for verification.
- $GS_{project}$: Gauze supplier for the project campaigns. Monitored for each campaign. Supplier's contract or invoice is available for verification.
- GC_{BL}: Gauze composition for the baseline campaign. Once. Supplier's certificate of analysis or similar documentation is available for verification.
- $GC_{project}$: Gauze composition for the project campaign. Monitored for each project campaign. Supplier's certificate of analysis or similar documentation is available for verification.
- EF_{reg}: Emissions level set by incoming policies or regulations in Romania. Monitored occasional. Azomures has personnel that verify changes in the Romanian Legislation.
- NCSG: N_2O concentration in the stack gas. Measured continuously and recorded every 2 second. Measured by NDIR analyser, MIR 9000.
- VSG: Volume flow rate of the stack gas. Measured continuously and recorded every 2 second. Measured by gas flow meter DURAG D-FL 100.
- TSG: Temperature of the stack gas during the project campaign. Recorded every 2 second.
- PSG: Pressure of the stack gas during the project campaign. Recorded every 2 second.
- PE_n: Total N_2O emissions during the n^{th} project campaign. To be calculated by equation: $PE_n = VSG * NCSG * 10^{-9} * OH$.
- OH: Operating hours of AOR in the specific monitoring period. Daily measured during a complete campaign. Data Acquisition System will record plant effective operating hours.
- NAP: Nitric acid production during a specific project campaign. Daily measured during a complete campaign. See NAP_{BC}.

- EF_n: Emission factor calculated for a specific project campaign. Calculated at the end of each project campaign. Calculated by equation: $EF_n = PE_n / NAP_n$.
- EF_{ma}: Moving average emission factor of after n^{th} campaigns, including the current campaign. End of each project campaign. Calculated by equation:

  $EF_{ma} = (EF_1 + EF_2 + \ldots + EF_n) / n$ $(tN_2O/tHNO_3)$.
- EF_p: Emissions factor to be applied to calculate the emissions reductions from the specific campaign. End of each project campaign. If $EF_{ma} \geq EF_n$ then $EF_p = EF_{ma}$. If $EF_{ma} < EF_n$ then $EF_p = EF_n$.
- EF_{min}: Lowest EF_n observed during the first 10 project campaigns. End of each project campaign. Equal to the lowest EF_n observed during the first 10 campaigns of the project. crediting period (t $N_2O/tHNO_3$).

Details of the data to be collected, the frequency of data recording, its certainty, and format are described. The format for data archiving seems appropriate for the project. The data storage length is indicated in the PDD to be at least 2 years and is hence in accordance to the requirements of AM0034. Data monitored and required for determination according to paragraph 37 of the JI guidelines are to be kept for two years after the last transfer of ERUs for the project. The data storage length was amended to comply with this requirement.

4.6 Estimate of GHG Emissions

Project boundary and greenhouse gas sources relevant for the project implementation are selected in accordance with AM0034 v. 03 and cover the facility and equipment for the complete nitric acid production process. The inlet of ammonia into the ammonia oxidation reactors of the three lines is the first point in the project boundary and the gas emission from the stacks is the last point in the nitric acid production process included in the project boundary.

The project activity only comprises the GHG N_2O. No leakage calculations are required to be accounted for.

The estimated amount of GHG emission reductions from the project is tonnes CO_2 equivalents (tCO_2e) during the 5 years crediting period, resulting in estimated average annual emission reductions of 1 821 595 tCO_2e/year.

The baseline emission factor, to be used for calculation of emission reduction during the crediting period, will be finally established when the data from the baseline campaigns are fully compiled and verified by the verifying AIE. However, the latest data from the baseline campaigns were used as the basis for the estimation of emissions reductions in the final PDD. The preliminary compiled data were made available in excel sheets. The final baseline emission factors for the three plants will need to be adjusted in accordance with the results of the QAL2 tests and shall be verified as the first step of the verification by the AIE performing the verification of this project..

A spreadsheet for the calculation of the emission reductions has been provided to confirm the estimate as presented in the PDD /34/. Relevant documents such as i) determination of the permitted operating conditions of the nitric acid plant (ammonia gas flow to the ammonia oxidation reactor, ammonia to air ratio flow, oxidation temperature and oxidation pressure);

ii) historical data to determine the historic campaign length related to the calculation of the calculation of the CL_{normal} have been provided to DNV /32/.

The estimated amount of GHG emission reductions from the project during the crediting period is 7 859 075 tonnes CO_2e (in average 1 821 595 tonnes CO_2e per annum). The design capacities for the plants for 330 operating days per year and the following estimated emissions factors has been used in the calculations:

Baseline emission factor kgN2O/tHNO3
11.83.
9.37
6.11

The emission reduction estimate can be replicated using the data and parameters values provided in the PDD and supporting files (preliminary excel sheets with baseline campaign monitoring data).[3]

4.7 Environmental Impacts

Azomures S.A. is operating according to the permit (based on IPPC) issued by Mures Regional Environmental Department /22/.

According to the Romanian legislation "ORDIN 860/2002" ad ORDIN 1037/2005" there are specific types of projects influencing the environment which require the environmental impact assessment. According to Mures Regional Environmental Department an Environmental Impact Assessment (EIA) is not mandatory. Azomures has requested the local environmental agency in Sibiu for a declaration whether an EIA is required and received in July 2008 and approval of the project stating no EIA is required /31/.

4.8 Comments by Local Stakeholders

There is no host country requirement for carrying out a local stakeholder consultation process.

Neither public nor any community are likely to be affected by the project and therefore project developer did not conduct stakeholder consultations.

4.9 Comments by Parties, Stakeholders and

The PDD was made publicly available on the JI website and Parties, stakeholders and NGOs were through the JI website invited to provide comments during a 30 days period from 14 May 2008 to 12 June 2008 under ref. no. 0137. No comment was received.

[3] The verification of the baseline emission factors and the normal campaign lengths are not included in the scope of the determination and will be finally verified by the verifying AIE during the verification of the first monitoring period.

APPENDIX A

JI DETERMINATION PROTOCOL

Table 1 Mandatory Requirements for Joint Implementation (JI) Project Activities

Requirement	Reference	Conclusion
The project shall have the approval of the Parties involved	Kyoto Protocol Article 6.1 (a)	OK (Refer to CAR 1)
Emission reductions, or an enhancement of removal by sinks, shall be additional to any that would otherwise occur	Kyoto Protocol Article 6.1 (b)	OK See Table 2, Sect. B.
The sponsor Party shall not acquire emission reduction units if it is not in compliance with its obligations under Articles 5 & 7	Kyoto Protocol Article 6.1 (c)	No sponsor Party is yet defined.
The acquisition of emission reduction units shall be supplemental to domestic actions for the purpose of meeting commitments under Article 3	Kyoto Protocol Article 6.1 (d)	No sponsor Party is yet defined.
Parties participating in JI shall designate national focal points for approving JI projects and have in place national guidelines and procedures for the approval of JI projects	Marrakech Accords, JI Modalities, §20	OK Romania (host Party) and France (Investor Party) has designated a focal point and has national guidelines and procedures in place for the approval of JI projects.
The host Party shall be a Party to the Kyoto Protocol	Marrakech Accords, JI Modalities, §21(a)/24	OK The Kyoto Protocol was ratified by Romania on 19 March 2001. The Kyoto Protocol was ratified by France on 31 May 2002.
The host Party's assigned amount shall have been calculated and recorded in accordance with the modalities for the accounting of assigned amounts	Marrakech Accords, JI Modalities, §21(b)/24	OK National Inventory Reports (UNFCCC website).
The host Party shall have in place a national registry in accordance with Article	Marrakech Accords, JI Modalities, §21(d)/24	OK

Requirement	Reference	Conclusion
7, paragraph 4		National Inventory Reports (UNFCCC website).
Project participants shall submit to the independent entity a project design document that contains all information needed for the determination	Marrakech Accords, JI Modalities, §31	OK PDD was provided.
The project design document shall be made publicly available and Parties, stakeholders and UNFCCC accredited observers shall be invited to, within 30 days, provide comments	Marrakech Accords, JI Modalities, §32	OK Commenting period from 14 May to 12 June 08 Ref. no. 137
Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, in accordance with procedures as determined by the host Party shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out	Marrakech Accords, JI Modalities, §33(d)	OK Azomures has an IPPC permit. No EIA is required by host Party regulations.
The baseline for a JI project shall be the scenario that reasonably represents the GHG emissions or removal by sources that would occur in absence of the proposed project	Marrakech Accords, JI Modalities, Appendix B	OK See Table 2
A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, JI Modalities, Appendix B	OK See Table 2
The baseline methodology shall exclude to earn emission reductions for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, JI Modalities, Appendix B	OK See Table 2
The project shall have an appropriate monitoring plan	Marrakech Accords, JI Modalities, §33(c)	OK See Table 2

Table 2 Requirements Checklist

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity *The project design is assessed.*					
Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
Are the project's spatial boundaries (geographical) clearly defined?	/1/	DR	Yes, the project boundaries are clearly defined. The N_2O abatement installation will be located in the existing nitric acid plants (NA2, NA3, NA4) at the Azomures SA nitric acid plant in Târgu Mures, Mures county, Romania. The inlet of ammonia into the ammonia oxidation reactors is the first point in the project boundary and the gas emission from the stacks is the last point in the nitric acid production process included into the project boundary.		OK
Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR	All components and facilities used for this project are clearly described in the PDD and are located in the existing nitric acid plants. The project applies only for emission reductions from the direct N_2O reductions from existing nitric acid plants. There are no indirect reductions from outside of the project facility.		OK
Participation Requirements *Referring to Part A and Annex 1 of the PDD as well as the JI glossary with respect to the terms Party, Letter of*					

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
Approval, Authorization and Project Participant.					
Which Parties and project participants are participating in the project?	/1/	DR	Romania is the host Party. There are two private entities involved: Azomures SA (Project Owner) and Vertis Environmental Finance Poland Sp. z o.o. (JI Project Advisor).		OK
Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/9/	DR	A Letter of Endorsement was issued on 7 February 2008 by the Ministry of Environment of the Republic of Romania. No Letter of Approval has been issued for the project.	~~CAR 1~~	OK
Technology to be employed *Determination of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The AIE should ensure that environmentally safe and sound technology and know-how is used.*					
Does the project design engineering reflect current good practices?	/1/	DR	The project involves the installation of a secondary catalyst in the ammonia oxidation reactors (burners) in the nitric acid production process to abate nitrous. The project does not involve any major changes with regard to the manufacturing technology and reflects current good practices.		OK
Does the project use state of the art technology or would the technology result in a significantly better performance, than any commonly used technologies in the host country?	/1/	DR I	This project activity uses a secondary catalyst that has the property of decomposing N_2O. The secondary catalyst causes approximately from 70% up to 95% of the N_2O to be	~~CL 1~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			destroyed The selection of secondary catalyst technology suppliers were at the time of the site visit not selected. Evidence of abatement efficiency should be provided at the time available in order to justify the assumption made when estimating the emission reductions.		
Does the project make provisions for meeting training and maintenance needs?	/1/	DR I	Azomures holds certificates for ISO9001 and ISO 14001 and it should be considered to implement the training needs of this JI project into the management system procedure for training.	~~CL 2~~	OK
B. Project Baseline *The determination of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
Is the discussion and selection of the baseline methodology transparent?	/1/	DR I	The baseline methodology is according to the AM0034 v02 methodology. However some adjustments are made. This applies to the use of overlapping of consecutive campaigns for the determination of the baseline factor for nitric acid plant N4. Since the primary catalyst and operating conditions during the first campaign are materially the same as that	~~CL 3~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			for subsequent campaign, this approach is regarded appropriate. However a more detailed description is required for the situation where the length of the baseline campaign is longer than the determined historical campaign. Further the justification of the approach should be included in the final PDD.		
Does the baseline methodology specify data sources and assumptions?	/1/	DR I	Yes, data sources are clearly identified, and this will be project specific measurements of the baseline campaign according to AM0034 v02 and referenced in PDD table D.1.1.3. However the source of the design capacity as per 31 December 2005 as presented at the site visit should be made available and referenced in the final PDD section D.1.4. The permitted operating ranges are determined from the operating manuals since historical data was not available. The ranges determined should be included in the updated PDD. Further the data for determination of the historical campaign length (CL_{normal}) is provided for 4 historical campaigns; however the calculated historical average (CL_{normal}) is not included in documentation. The provided information for the primary catalyst for historical and baseline campaigns are not complete.	~~CL 4~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			The above issues should be clarified/corrected and included in the final PDD.		
Does the baseline methodology sufficiently describe the underlying rationale for the algorithm/formulae used to determine baseline emissions (e.g. marginal vs. average, etc.)	/1/	DR	Yes, the baseline methodology sufficiently describes the underlying rationale for algorithm/formulae used to determine baseline emissions.		OK
Does the baseline methodology specify types of variables used (e.g. fuels used, fuel consumption rates, etc)?	/1/	DR	Yes, all variables are described in tables D.1.1.1 and D.1.1.3 of the PDD.		OK
Does the baseline methodology specify the spatial level of data (local, regional, national)?	/1/		Yes, all data are project specific. Only N_2O emissions level set by incoming policies or regulations will be monitored as a national level of data.		OK
Baseline Scenario Determination *The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.*					
What is the baseline scenario?	/1/	DR	The baseline scenario has been defined as the continuation of the current situation, where there will be no installation of technology for the destruction or abatement of N_2O.		OK
What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/	DR I	The selection of the most likely baseline scenario has been assessed according to AM0028 version 4.1 ***Step 1a*** of the baseline scenario identification includes listing of all technically feasible	~~CL 5~~	OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			alternatives to the given project. The principal theoretical alternatives to the project are: ▪ Continuing to operate the plant as is ▪ Switch to alternative production method not involving ammonia oxidation process ▪ Alternative use of N_2O such as: -Recycling of N_2O as a feedstock for the plant -The use of N_2O for external purposes ▪ Installation of Non-Selective Catalytic Reduction (NSCR) De-NO_x system ▪ Installation of N_2O abatement not as a JI project ▪ Installation of an N_2O destruction or abatement technology: -Tertiary measure for N_2O destruction -Primary or secondary measures for N_2O destruction or abatement ***Step 1b*** includes all possible technically feasible options to handle NO_x emissions. Non-Selective De-NO_x units cause also reduction of N_2O and thus it is necessary to elaborate also on this technical option. Possibilities regarding NO_x emissions are as following: ▪ Continuation of the current situation, whether either De-NO_x units		

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			is installed or not ▪ Installation of new Selective Catalytic Reduction De-NO_x unit ▪ Installation of a new Non-Selective Catalytic reduction (NCSR) De-NO_x unit ▪ Installation of a new tertiary measure that combines NO_x and N_2O emission reduction ***Step 2*** includes the elimination of baseline alternatives that do not comply with legal or regulatory requirements. There are no regulatory requirements in Romania regarding N_2O emissions. NO_x emissions are regulated by the Approval of Integrated Pollution Prevention and Control (IPPC) requiring keeping concentration of NO_x emissions below 500 mg/Nm^3 level. Azomures has installed production lines Selective Catalytic Reduction (SCR) De-NO_x units in all three lines (NA2, NA3 and NA4). No alternatives were excluded at this step. ***Step 3*** includes the elimination of baseline alternatives that face prohibitive barriers (barrier analysis). ***Step 3 a*** As there is no barrier in form of no access to international capital markets, lack of infrastructure or lack of skilled personnel as		

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			Azomures SA is capable of implementing and operating a de-N_2O project. Thus technology barriers related to technology and operational risk are assessed for the different alternatives. The information presented are reasonable. ***Step 3b*** Based on the information provided in step 3a (which is regarded reasonable), the following alternatives were eliminated. ▪ Switch to alternative production method not involving ammonia oxidation process ▪ Alternative use of N_2O such as: -Recycling of N_2O as a feedstock for the plant -The use of N_2O for external purposes ▪ Installation of Non-Selective Catalytic Reduction (NSCR) De-NO_x system ▪ Installation of N_2O abatement not as a JI project ▪ Installation of an N_2O destruction or abatement technology: -Tertiary measure for N_2O destruction -Primary measures for N_2O destruction or abatement ***Step 4:*** Identification of the most economically attractive baseline scenario		

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			alternative. From the analysis in step 3 the only remaining alternative achieving N_2O emission reduction, other than continuation of status quo, is secondary catalytic reduction of N_2O in existing reaction chambers of ammonia oxidation reactors. The defined baseline meets current regulations, and requires no additional investments or additional operating costs. A simple cost analysis is thus not necessary since it is only one alternative after elimination of other alternatives in step 3. However barriers for excluding tertiary technologies should be further clarified. ***Step 5*** Re-assessment of Baseline Scenario in course of proposed project activity's lifetime. This step is sufficiently included in the PDD.		
Has the baseline scenario been determined according to the methodology?	/1/	DR	Yes, the baseline methodology is prepared according to the AM0034 v02; however, there are some discrepancies (see CL 2 above).	~~CL 2~~	OK
Has the baseline scenario been determined using conservative assumptions where possible?	/1/	DR	Baseline scenario is defined as the continuation of the status quo. The determination is based on reasonable arguments and analysis.		OK
Does the baseline scenario sufficiently take into account relevant	/1/	DR	Yes, in Romania there is currently no	~~CL 6~~	OK

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national and/or sectoral policies, macro-economic trends and political aspirations?		I	regulation on N_2O emissions. Imposing of IPPC Directive limits on N_2O emissions is possible during the crediting period; however regulation changes will be monitored and be taken into account during verifications. Presently Azomures SA holds an IPPC permit, which is not limiting N_2O emissions. NO_x emissions are regulated by the Approval of Integrated Pollution Prevention and Control requiring keeping concentration of NO_x emissions below 500 mg/Nm^3. Achema has installed at all three production lines Selective Catalytic Reduction (SCR) De-NO_x units. The measurements of NO_x where made available at the site visit however the present level of NO_x emissions should be clearly stated in the final PDD.		
Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR	Yes.		OK
Have the major risks to the baseline been identified?		DR	The methodology takes into account the possible risk of changing regulation with proper adjustments to the baseline N_2O emission.		OK
Additionality Determination *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.*					

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What is the methodology selected to demonstrate additionality?	/1/	DR	The "Tool for the demonstration and assessment of additionality" (version 3) has been used to demonstrate additionality. However a new version 4 is now available and the final PDD should be adjusted accordingly.	~~CL 7~~	OK
Is the project additionality assessed according to the methodology?	/1/	DR	Yes.		OK
Are all assumptions stated in a transparent and conservative manner?	/1/	DR	Yes.		OK
Is sufficient evidence provided to support the relevance of the arguments made?	/1/ /30/	DR	Yes. The project additionality is demonstrated by applying the "Tool for the demonstration and assessment of additionality" ***Step 1*** Identification of alternatives to the project activity consistent with current laws and regulations. This step has been omitted because this step is covered in B.1 in the PDD. ***Step 2*** - Investment analysis As catalytic N_2O destruction facilities generate no financial or economical benefits other than JI related income, a simple investment analysis is applied. The proposed JI project activity is, without the revenues from the sale of ERU's, less	~~CL 8~~	OK

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			economically and financially attractive than the baseline scenario. The investment analysis provided shows that the only revenue arises from sales of ERU's. The investment consists of the engineering, construction, shipping, installation and commissioning of the secondary catalyst and the measurement equipment. The operating costs consist of the regular change of the catalyst as well as personnel costs for the supervision of the measurement equipment. Financial analysis should be provided. ***Step 3*** - Barrier analysis: A barrier analysis is not used for demonstrating additionality in this project. ***Step 4*** - Common practice analysis: N_2O secondary abatement is not common practice in Romania. Usually, the nitric acid industry releases into the atmosphere the N_2O generated as a by-product of the nitric acid production, as it does not have any economic value or toxicity at typical emission levels.		
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are clearly defined.*					
Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/		Yes, the starting date is 20 September 2006 and the project is expected to operate beyond 2012.		OK

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Is the start of the crediting period clearly defined and reasonable?	/1/		In the PDD section C.3, the crediting period is stated to start 1 January 2008, during the site visit AIE has been informed that, the secondary catalyst is scheduled to be installed in the period May to August 2008.	~~CAR 2~~	OK
D. Monitoring Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
Is the monitoring plan documented according to the chosen methodology and in a complete and transparent manner?	/1/	DR	Yes, the monitored data are in compliance with methodology AM0034. However, the measurement of secondary air is included in the monitoring plan. This is not required by AM0034. It should be clarified why this parameter is included.	~~CL 9~~	OK
Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of ERUs, for this project activity, whichever occurs later?	/1/	DR	Monitoring data will be archived according to the AM0034 v.02 methodology, which does require archiving of the baseline data for the entire crediting period (except for ammonia oxidation parameters which will be archived for at least 2 years) and for project data for a period of at least 2 years. It should be amended to be in accordance to the requirement of archiving the data for a period of 2 years after the end of the crediting period or the last issuance of ERUs.	~~CL 10~~	OK
Monitoring of Project Emissions *It is established whether the monitoring plan provides for reliable and complete project emission data over time.*					

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Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	Yes, the monitoring plan provides for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period. However, the responsibility for monitoring of possible changes in regulations of N_2O emission levels has not been clearly identified in the PDD.	~~CL 11~~	OK
Are the choices of project GHG indicators reasonable and conservative?	/1/	DR	Yes, N_2O is the only GHG indicator that is to be accounted for. According to the methodology, all data for this indicator are on a project specific basis.		OK
Is the measurement *method* clearly stated for each GHG value to be monitored and deemed appropriate?	/1/	DR	Yes, the measurement methods are presented in the PDD and in additional documentation provided at the site visit.		OK
Is the measurement *equipment* described and deemed appropriate?	/1/ /12/ /13/ /14/ /15/ /16/ /17/	DR	Yes. Relevant equipment is described and planned to meet EN 14181 requirements.		OK
Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/ /12/ /13/	DR	The accuracy of the N_2O analyser and stack gas flow meter is according to AM0034 required. QAL 1 certificates are to be	~~CL 12~~	OK

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			provided. A QAL 2 tests are planned to be conducted in and the results from the tests need to be accounted for and the final overall uncertainty (UNC as described in AM0034) will then be determined. The estimated overall uncertainty should be taking into account the uncertainty of the N_2O analyser, stack gas flow meter and the measurement of nitric acid produced. QAL 3 is according to the table in D.2. planned for the N_2O analysers. However, the QAL 3 is procedure is not considered for the stack gas flow meters. Further the description of the implementation of three levels of quality assurance is not addressed in the monitoring plan in Annex 3.		
Is the measurement *interval* identified and deemed appropriate?	/1/	DR	Yes. The measurement intervals are in accordance to AM0034.		OK
Is the *registration, monitoring, measurement* and *reporting* procedure defined?	/1/	DR I	These procedures are not sufficiently described. Responsibilities e.g. for final monitoring report preparation are not indicated.	~~CL 13~~	OK
Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/ /17/	DR I	Yes, this has been confirmed during the site visit. Additionally, a procedure for the maintenance of the monitoring equipment is described.		OK

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Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/ /31/	DR I	The description of data acquisition, processing, presentation and archiving is briefly described in PDD. However, such procedures should be developed and considered to be incorporated into the existing management system.	~~CL 14~~	OK
Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.*					
Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	Yes, dataset is according to AM0034 v02.		OK
Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR	Yes, GHG indicators are reasonable and conservative. Change of the baseline is expected in case of the regulations change to assure the conservativeness of the approach.		OK
Is the measurement *method* clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR I	Yes, the measurement methods are presented in tables D.1.1.3 and D.1.1. of the PDD and are deemed appropriate. Presently ongoing campaigns, which will be used for setting the baseline, are using N_2O concentration and flow measurement and all necessary monitoring equipment is installed and in operation.		OK
Is the measurement *equipment* described and deemed appropriate?	/1/ /17/	DR	Yes. Relevant equipment is described and deemed		OK

CHECKLIST QUESTION * MoV = Means of Verification, DR= Document Review, I= Interview	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			appropriate.		
Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR I	Yes. However QAL 2 documents for the monitoring equipment were not ready at the time of the site visit (see CL 12 above). The final determination of the overall uncertainty should be checked during emission reduction verification, further it should be checked that the uncertainty is taken into account in calculations as described in AM0034 v2.	~~CL 12~~	OK
Is the measurement *interval* for baseline data identified and deemed appropriate?	/1/	DR	Yes, the measurement intervals are in accordance to AM0034.		OK
Is the *registration, monitoring, measurement* and *reporting* procedure defined?	/1/ /17/	DR I	The PDD describes an automatic process of data monitoring, acquisition and archiving is performed by the computer system; however, responsibilities e.g. for final monitoring report preparation are not indicated.	~~CL 13~~	OK
Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/ /17/	DR I	Yes, it has been confirmed during the site visit. The maintenance procedures for the ammonia oxidation parameters shall follow the existing procedures for the operation of the nitric acid plan; however this information is not sufficiently addressed in the PDD.	~~CL 15~~	OK
Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR I	The description of data acquisition, processing, presentation and archiving is	~~CL 14~~	OK

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			briefly described in PDD. However such procedures should be developed and considered to be incorporated into the existing management system.		
Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/3/	DR	According to AM0034, leakage is not to be considered.		N/A
Are the choices of project leakage indicators reasonable and conservative?	/3/	DR	According to AM0034, leakage is not to be considered.		N/A
Is the measurement *method* clearly stated for each leakage value to be monitored and deemed appropriate?	/3/	DR	According to AM0034, leakage is not to be considered.		N/A
Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
Is the authority and responsibility of overall project management clearly described?	/1/	DR I	Azomures is in charge of operation and maintenance of the N_2O monitoring system. The Nitric acid production department is responsible for the N_2O monitoring and for reporting faults in the operation of the monitoring system. The authority and responsibility of overall project management is not clearly described	~~CL 16~~	OK

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			in the PDD. Further no reference is made to other aspects like internal audits of system and data, corrective and preventive actions.		
Are procedures identified for training of monitoring personnel?	/1/	DR I	Training records of operating personnel have been presented during the site visit; however, there was no procedure that would assure competence requirements to be sustained (e.g. responsibilities for training of new maintenance personnel).	~~CL 14~~	OK
Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR I	Procedures for emergency preparedness for cases where emergencies can cause unintended emissions have not been addressed.	~~CL 14~~	OK
Are procedures identified for review of reported results/data?	/1/	DR I	The procedures described in PDD are related only to automatic checking of data by monitoring system. No description related to responsibilities for review of final report, calculation etc. is developed.	~~CL 14~~	OK
Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR I	Procedures for corrective actions in order to provide for more accurate future monitoring and reporting have not been addressed.	~~CL 14~~	OK
E. Calculation of GHG Emissions by Source *It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.*					

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Calculation of GHG Emission Reductions – Project emissions *It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
Are the calculations documented according to the chosen methodology and in a complete and transparent manner?	/1/	DR I	The formulas described in section D.1.1.2 and D.1.1.4 of the PDD are in accordance to AM0034 v.2. The baseline data is given in Annex 2. The calculations are based on data available at the time of preparation of the PDD, however since baseline campaign monitoring data are not finalized the calculations will be finalised when the monitoring is complete and the final calculations are subject to verification by the verifying AIE. Preliminary data has been provided.		OK
Have conservative assumptions been used when calculating the project emissions?	/1/ /3/	DR	Yes, all assumptions are in line with AM0034 v.03 methodology.		OK
Are uncertainties in the project emission estimates properly addressed?	/14/ /15/ /16/	DR	Yes. The accuracy of the N_2O analyser and stack gas flow meter is given. QAL 1 certificates are not available, this should be justified. A QAL 2 test is to be conducted and results from the test to be accounted for and the overall uncertainty (UNC as described in	~~CL 12~~	OK

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			AM0034) is to be determined and verified by the verifying AIE.		
Calculation of GHG Emission Reductions – Baseline emissions *It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
Are the calculations documented according to the chosen methodology and in a complete and transparent manner?	/34/	DR	Yes.		OK
Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	Yes. The basis for the baseline emission data will be the measurement results from the N_2O analyzer MIR 9000 from Environment S.A.,France, the tail gas flow meter (pitot tube with multiple holes), and the nitric acid data from the DZL363 flow meter. The baseline campaign measurements are subject to verification by the verifying AIE.		OK
Are uncertainties in the baseline emission estimates properly addressed?	/14/ /15/ /16/	DR	The overall uncertainty of the monitoring system shall be determined and the measurement error will be 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. The overall UNC needs to be verified by the		OK

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			verifying AIE.		
Calculation of GHG Emission Reductions – Leakage *It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
Are the leakage calculations documented according to the chosen methodology and in a complete and transparent manner?	/3/	DR	According to AM0034, leakage is not to be considered.		OK
Have conservative assumptions been used when calculating the leakage emissions?	/3/	DR	According to AM0034, leakage is not to be considered.		OK
Are uncertainties in the leakage emission estimates properly addressed?	/3/	DR	According to AM0034, leakage is not to be considered.		OK
Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.*					
Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	Yes, emission reductions are real, measurable and give long-term benefits related to the mitigation of climate change. The implemented monitoring methodology and measurement system allow for calculation of real project specific emission reductions.		OK
F. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided*					

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to the AIE.					
Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/ /31/	DR I	The project is not expected to have any adverse environmental impact.		OK
Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/31/	DR	Azomures S.A. is operating according to the permit (based on IPPC) issued by Mures Regional Environmental Department. According to Mures Regional Environmental Department an Environmental Impact Assessment (EIA) is not mandatory.		OK
Will the project create any adverse environmental effects?	/1/	DR I	The project is not expected to affect the environment in any adverse way. At the time of the site visit the supplier of catalyst was not yet selected thus it should be clarified after the selection of the supplier if there is a risk for potential catalyst waste.	~~CL 17~~	OK
Are transboundary environmental impacts considered in the analysis?	/1/	DR I	There are no transboundary environmental impacts. See C17.	~~CL 17~~	OK
Have identified environmental impacts been addressed in the project design?	/1/	DR I	The project does not have any adverse environment impact.		OK
Does the project comply with environmental legislation in the host country?	/1/	DR I	Yes.		OK
G. Stakeholder Comments *If required by the host country, the AIE should ensure that stakeholder comments have been invited with appropriate media*					

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and that due account has been taken of any comments received.					
Have relevant stakeholders been consulted?	/1/	DR I	There is no host country requirement for stakeholder comments. Neither the public nor any community will be affected or likely to be affected by the project and therefore the project developer did not conduct stakeholder consultations.		OK
Have appropriate media been used to invite comments by local stakeholders?			See above.		OK
If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?			See above.		OK
Is a summary of the stakeholder comments received provided?			See above.		OK
Has due account been taken of any stakeholder comments received?			See above.		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
CAR 1 A Letter of Endorsement was issued on 7 February 2008 by the Ministry of Environment and permanent development of Romania. Authorised translation was made available (signed 6 March 2008). No Letter of Approval has been issued for the project.	A	The Ministry of Environment and Permanent development of Romania: *Letter of Endorsement*, No. 375, dated 7 February 2008 is available. Further, the Letter of Approval (LoA) by the designated focal point of Romania, the Ministry of Environment and Forests dated 10 May 2010 is available.	The designated focal point of Romania has issued a Letter of Approval (LoA) on 10 May 2010, authorizing Azomures SA as a project participant /38/. This CAR is closed.
CAR 2 The start date of the crediting period is stated to be 1 January 2008 in the PDD. The start date should be corrected to the date where the project started to reduce N_2O emissions.		The start date is 24 July 2008 when the reduction of N_2O started in plant no. 3. The installation of secondary catalyst was 28 October 2008 and 11 August 2008 respectively for plant No. 3 and plant No. 4.	Excel sheet has been provided including the starting date. This CL is closed.
CL 1 This project activity uses a secondary catalyst that has the property of decomposing N_2O. The secondary catalyst causes approximately from 70% up to 95% of the N_2O to be destroyed Evidence of abatement efficiency should be provided at the time available in order to justify the assumption made when estimating	A	The supplier of secondary catalyst is BASF. Contract of 5 May 2008 was made available for verification. Excel sheets with observations of N_2O concentrations measured after the installation of secondary catalyst has been provided.	82% abatement efficiency is guaranteed in the contract. However abatement efficiencies of 80- 92% was used in the estimation of emissions reductions based on observations of N_2O concentrations measured after installation of the secondary catalyst. DNV was able to verify this from the provided data. Spent catalyst will be sent back to the

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
the emission reductions.			supplier for reclaiming. This CL is closed.
CL 2 Azomures holds certificates for ISO9001 and ISO 14001 and it should be considered to implement the training needs of this JI project into the management system procedure for training.	A	DNV was provided with evidence related to training of maintenance personnel for the monitoring equipment (training certificates).	OK This CL is closed.
CL 3 The baseline methodology is according to the AM0034. However, some adjustments are made. This applies to the use of overlapping of consecutive campaigns for the determination of the baseline factor for plant N4. Since the primary catalyst and operating conditions during the first campaign are materially the same as those for the subsequent campaign, this approach is regarded appropriate. However the justification of the approach should be included in the final PDD.	B	Updated PDD is provided.	The client has provided information about the overlapping campaigns approach. DNV has checked the available data for N_2O measurements and preliminary compiled data and found the approach to be acceptable. The verification of the baseline campaigns are not included in the scope of the determination hence the final verifications of the baseline campaigns and the final baseline emissions factors are subject to be verified by the verifying AIE. See FAR 1 in page 3. This CL is closed.
CL 4 Data sources for the baseline methodology are	B	Updated PDD has been provided. The information for historical	The PDD has been checked and the requested information is sufficient.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
clearly identified, and this will be project specific measurements of the baseline campaign according to AM0034 and referenced in PDD table D.1.1.3 The permitted operating ranges are determined from the operating manuals since historical data was not available. However, the ranges included in the updated PDD are not consistent to the documentation made available from the operating manual. Further the data for determination of the historical campaign length (CL_{normal}) is provided for 4 historical campaigns; however the calculated historical average (CL_{normal}) is not included in documentation. It should be justified why only 4 campaigns are used. The provided information for the primary catalyst for historical and baseline campaigns are not complete. The source of the design capacity as per 31 December 2005 as presented at the site visit should be made available and referenced in the final PDD section D.1.4. The above issues should be clarified/corrected and included in the final PDD.		campaigns and permitted operating ranges has been amended. Excel file has been provided including the nitric acid production data for the determination of CL_{normal}. Only four campaigns are used since prior to these four campaigns a monitoring reporting system was not in place.	The source of design capacities is made available /27/. Excel sheets with preliminary compiled data for the calculation of CL_{normal} have been provided. However the final verification of the normal campaigns lengths is not included in the scope of determination and is subject to final verification by the verifying AIE. See FAR 2 on page 3. This CL is closed.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
CL 5 **Identification of baseline scenario** Step 3 Eliminate baseline alternatives that face prohibitive barriers: Barriers for excluding tertiary technologies should be further clarified.		Updated PDD is provided. Tertiary De-N_2O reduction is not economically feasible in the Azomures plant as it would require principal changes to complete design of nitric acid production lines and NO_x emissions abatement is handled by installation of Selective Catalytic reduction unit	OK The updated PDD includes the required information. This CL is closed.
CL 6 NO_x emissions are regulated by the IPPC permit issued by Agentia Regionala Pentru Protectia Mediului Sibiu (Agency for Environmental Protection Sibiu) Nr. 4598/30.10.2007 requiring to keep concentration of NO_x emissions below 500 mg/Nm^3 level. Azomures has installed Selective Catalytic Reduction (SCR) De-NO_x units. The measurements of NOx where made available at the site visit however the present level of NOx emissions should be clearly stated in the PDD.	B	Actual NOx emissions are below the IPPC ELV defined in the IPPC permit and are online published on the Azomures web site (www.azomures.com) under Oxidi de azot section of the website in the ppmV unit.	Amended PDD including the required information has been provided. This CL is closed.
CL 7 The "Tool for the demonstration and assessment of additionality" (version 3) has been used to demonstrate additionality. However a new version 4 is now available	B	Version 4 was applied and PDD updated.	Amended PDD including the required information has been provided. This CL is closed

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
and the final PDD should be adjusted accordingly.			
CL 8 Financial information should be provided to show the barrier of cost of investment is mitigated by income from ERUs from the project activity.	B	Cots and revenue data has been provided.	DNV was able to verify that the income from the ERUs mitigates the investment and operational costs. This CL is closed.
CL 9 The monitored data are in compliance with methodology AM0034. However the measurement of secondary air is included in the monitoring plan. This is not required by AM0034. It should be clarified why this parameter is included.	D	The secondary air flow is not required according to AM0034, however in order to calculate or check the stack gas flow it can be of interest.	OK This CL is closed,
CL 10 Monitoring data will be archived according to the AM0034 v.03 methodology, which does require archiving of the baseline data for the entire crediting period (except for ammonia oxidation parameters which will be archived for at least 2 years) and for project data for a period of at least 2 years. It should be amended to be in accordance to the requirement of archiving the data for a period of 2 years after the end of the crediting period	D	The archiving of data will be according to the requirement. PDD is updated.	Updated PDD is provided and the archiving of data is according to the requirements. This CL is closed.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
or the last issuance of ERUs.			
CL 11 The monitoring plan provides for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period. However, the responsibility for monitoring of possible changes in regulations of N_2O emission levels has not been clearly identified in the PDD.	D	Updated PDD is provided.	Updated PDD is provided and monitoring of changes in regulations of N_2O is included. This CL is closed
CL 12 The accuracy of the N_2O analyser and stack gas flow meter is according to AM0034 required. QAL 1 certificates are to be provided. A QAL 2 tests are planned to be conducted and the results from the tests need to be accounted for and the final overall uncertainty (UNC as described in AM0034) will then be determined. The estimated overall uncertainty should be taking into account the uncertainty of the N_2O analyser and stack gas flow meter. QAL 3 is according to the table in D.2. planned for the N2O analysers. However the	D	QAL 1 is according to EN-ISO 14569. QAL 2 test has been performed and reports provided for all plants. The overall uncertainty for N_2O concentration and stack gas flow is available from the QAL 2 reports. The document "The monitoring of the N2O emissions from the nitric acid plant. Quality assurance manual. The validation of the monitoring of the data according to QAL 3 under EN 14181" is provided.	DNV has received the QAL1, QAL2 and QAL 3 documentation /12/-/16/. This CL is closed.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
QAL 3 is procedure is not considered for the stack gas flow meters. Further the description of the implementation of three levels of quality assurance is not addressed in the monitoring plan in Annex 3.			
CL 13 The PDD describes an automatic process for data monitoring, acquisition and archiving performed by the computer system. However these procedures are not sufficiently described. Responsibilities e.g. for final monitoring report preparation are not indicated.	D	The document "The monitoring of the N2O emissions from the nitric acid plant. Quality assurance manual. The validation of the monitoring of the data according to QAL 3 under EN 14181" describes the responsibilities for monitoring and maintenance. Vertis is responsible for preparing the monitoring report.	OK The mentioned document is made available and the PDD is updated and includes the required information. This CL is closed.
CL 14 Procedures for the JI project is planned to be incorporated into the existing management system. The following procedures should be developed: -Training of monitoring personnel: procedure to assure competence requirements to be sustained (e.g. responsibilities for training of new maintenance personnel). -Procedures for emergency preparedness for cases where emergencies can cause unintended emissions have not been addressed.	D	The document "The monitoring of the N2O emissions from the nitric acid plant. Quality assurance manual. The validation of the monitoring of the data according to QAL 3 under EN 14181" describes the responsibilities for monitoring and maintenance. Azomures is ISO 9001 and ISO 14001 certified and procedures is planned to be incorporated.	OK The mentioned document is made available. This CL is closed.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
- Procedures for review of reported results/data. - Procedures for corrective actions in order to provide for more accurate future monitoring and reporting have not been addressed. - Procedure for data acquisition, processing, presentation and archiving. However such procedures are planned to be incorporated into the existing management system and should be prepared prior to the first verification			
CL 15 Relevant equipment for determination of baseline emissions are described and deemed appropriate. The maintenance procedures for the ammonia oxidation parameters shall follow the existing procedures for the operation of the nitric acid plants; however this information is not sufficiently addressed in the PDD.	D	Azomures is ISO 9001 and ISO 14001 Regular calibration and control for ammonia oxidation parameters will be according to existing measurement requirements.	OK This CL is closed.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 2	Summary of project owner response	Determination team conclusion
CL 16 Authority and responsibility of overall project management should be clearly defined.	D	The document "The monitoring of the N2O emissions from the nitric acid plant. Quality assurance manual. The validation of the monitoring of the data according to QAL 3 under EN 14181" describes the responsibilities for monitoring and maintenance. Further the revised PDD includes the overall description of responsibilities in D1.	OK Revised PDD is received. This CL is closed.
CL 17 The project will not affect the environment in any adverse way. The project owner should seek to clarify if there is a risk for potential catalyst waste.	F	The catalyst is returned to the catalyst supplier for reclaiming, this is included in the contract for supply of secondary catalyst.	OK This CL is closed.
CL 18 Calibration gas for N_2O: A certificate of calibration gas was provided at the site visit (N2O concentration 1193 ppm). However it was observed that a calibration gas with an incorrect concentration (761 ppmv) was used from July 2007 to Feb. 2008. This should be clarified.	D	The QAL 2 report includes a correction factor that shall be applied for the period where the incorrect calibration gas was used.	OK This CL is closed. A FAR 3 is raised to be followed up during the first period verification, see page 3.

APPENDIX B

CERTIFICATES OF COMPETENCE

Rafi-ud-Din Khawaja

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:		Yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas						
Renewables	*Hydro power*	Jan 2009				
	Wind power					
	Other renewable					
Biomass						
Grid connection of isolated system						
Cement						
Waste-heat / waste-gas recovery						
Efficiency of thermal power plants						
Coal mine methane						
Fuel switch						
Manure management						
Waste / wastewater treatment						
Energy efficiency						
N_2O					Jul 2009	Jul 2009
HFCs						
Flare reduction						
PFCs						
Charcoal						
CO_2 recovery						
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 9 July 2009

Michael Lehmann
Technical Director, Climate Change Services

Michael Lehmann

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:		Yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Renewables	*Hydro power*	Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
	Wind power	Jan 2009	Jan 2009			
	Other renewable	Jan 2009	Jan 2009			
Biomass		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Grid connection of isolated system		Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
Cement		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Waste-heat / waste-gas recovery		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Efficiency of thermal power plants		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Coal mine methane		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Fuel switch		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Manure management		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Waste / wastewater treatment		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Energy efficiency		Jan 2009	Jan 2009		Jan 2009	Jan 2009
N_2O		Jan 2009	Jan 2009		Jan 2009	Jan 2009
HFCs		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Flare reduction		Jan 2009	Jan 2009		Jan 2009	Jan 2009
PFCs		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Charcoal		Jan 2009	Jan 2009		Jan 2009	Jan 2009
CO_2 recovery		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Transport		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Non-renewable biomass		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Biofuel		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Pipeline leakage reduction		Jan 2009	Jan 2009		Jan 2009	Jan 2009
SF_6		Jan 2009	Jan 2009		Jan 2009	Jan 2009

Høvik, 9 January 2009

Michael Lehmann
Technical Director, Climate Change Services

Trine Kopperud

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:		Yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas						
Renewables	*Hydro power*					
	Wind power					
	Other renewable					
Biomass						
Grid connection of isolated system						
Cement						
Waste-heat / waste-gas recovery						
Efficiency of thermal power plants						
Coal mine methane						
Fuel switch						
Manure management						
Waste / wastewater treatment						
Energy efficiency				Jan 2009		
N_2O		Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
HFCs						
Flare reduction						
PFCs						
Charcoal						
CO_2 recovery				Jan 2009		
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 9 January 2009

Michael Lehmann
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