Report № 2007-01	JI Project – Nitric Oxide Reduction at Agropolychim JSC

Date of issue:	Rev. №	Number of pages:
2007-04-10	**02**	**35**

Report name:

Annual Monitoring Plan for the Nitrous Oxide Reduction in the Project of the Fertilizers Plant Agropolychim, Devnia, Bulgaria

Name of plant:

AGROPOLYCHIM JSC

Address, telephone, fax, e-mail, web site:

Industrial area, Devnia, Bulgaria
Tel.: +359-519-97-526
Fax: + 359-519-97-594
e-mail: berbenkov@agropolychim.bg
www.agropolychim.bg

Time period for monitoring:

01.01.06 – 31.12.06

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ANNUAL MONITORING PLAN

Report № 2007-01 **Date of issue: 2006-03-30**

INTRODUCTION

Agropolychim JSC is located in Devnia, near the city of Varna, in Northeast Bulgaria.
Agropolychim was founded in 1974 and was privatized in November 1999. Acid & Fertilizers, USA acquired 63% of the company from the Bulgaria Privatization Agency.
Acid & Fertilizers LLC, USA is a joint venture between DAVENPORT INDUSTRIES – 99% and CUMERIO – 1%.
A major restructuring program was implemented. Currently Acid & Fertilizers controls 97% of Agropolychim JSC. Board members are Vassil Alexandrov (CEO), Hristo Petrov (CEO), Philippe Rombaut (CEO), Krassimir Berbenkov (Vice CEO), Georgy Nakov (CFO), Martin Martinov (Chief Legal Advisor), Tom Beamish (CEO Cumerio).

1. NITRIC ACID PRODUCTION IN GENERAL

The crucial step in the nitric acid production, the catalytic combustion of ammonia, was developed by Ostwald around the beginning of this century. The first production facility employing the Ostwald process came on stream in 1906 at Gerthe, Germany.

All plants for the production of weak nitric acid (concentrations ranging from 30 to 70 percent nitric acid) are based on the Ostwald process and use the same basic chemical operations:

a) oxidation of ammonia (NH_3) with air into nitric oxide (NO)

b) oxidation of nitric oxide (NO) into nitrogen dioxide (NO_2)

c) absorption of nitrogen dioxide (NO_2) in water to produce nitric acid (HNO_3)

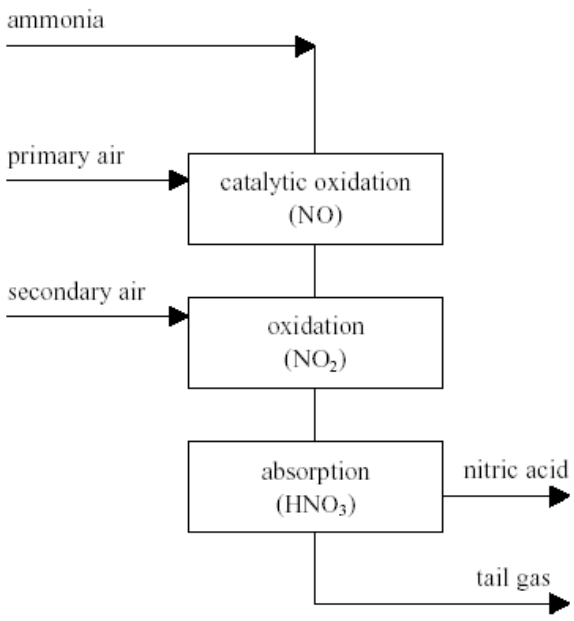

Figure 1 The Ostwald process

1.1. Raw material preparation

The liquid ammonia (NH_3) is evaporated and filtered. Air is purified by using two or three stage filtration and is pressurized. Both the ammonia filter and the air filter should remove all particles as good as possible. The air is split in two streams: one stream is led to the catalytic reactor, while the other stream is led to (the bleaching section of) the absorption column.

1.2. Oxidation of ammonia

The evaporated ammonia (NH_3) is mixed with the purified air in a ratio of approx. 1:10 and (optionally) filtered. This ammonia/air mixture is led across a catalyst. The mixture reacts according to the following equation:

$4\ NH_3 + 5\ O_2 \leftrightarrow 4\ NO + 6\ H_2O$

Simultaneously nitrous oxide (N_2O), nitrogen (N_2) and water (H_2O) are formed as well, in accordance with the following equations:

$4\ NH_3 + 3\ O2 \leftrightarrow 4\ N_2 + 6\ H_2O$

$4\ NH_3 + 4\ O_2 \leftrightarrow 2\ N_2O + 6\ H_2O$ Note: forming of laughing gas

Both reactions are undesirable, because they influence the yield of nitric oxide disadvantageously and they have great impact on the environment. The yield (percentage of ammonia that is converted to NO) depends on pressure and temperature as indicated in the following figure:

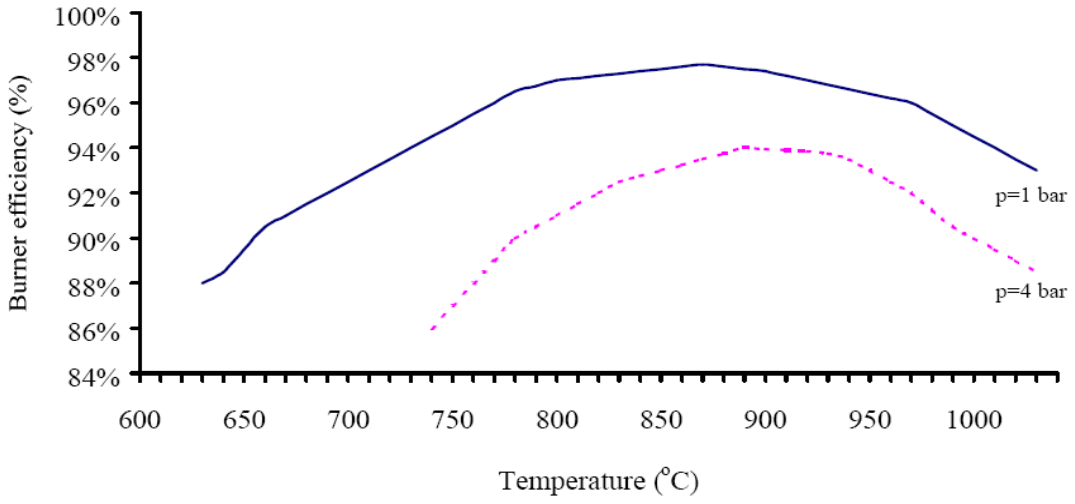

Figure 2 Possible conversion of NH_3 to NO on Platinum gauze as a function of temperature

The most universally preferred catalyst consists of platinum wire that is knitted into mesh gauze. Five to ten percent rhodium normally is added to the platinum to increase its strength and to reduce platinum costs, and up to 5% palladium is used to reduce cost. Catalyst poisoning (by air pollution or contamination from the ammonia) and unfavorable conditions (like poor ammonia/air mixing and poor gas distribution across the catalyst) may reduce the NO-yield.

During the reaction process, some of the platinum and rhodium from the catalyst vaporises. In most cases a platinum recovery system is installed below the catalyst, known as a "getter" or catchment. This system consists of a palladium alloy. A "getter" allows a 60 to 80% recovery of the total catalyst loss.

Due to loss of the platinum the efficiency of the catalyst drops over time. This leads to an increasing generation of N_2O over the campaign (time between change of platinum gauze). In general in the start of the campaign the generation of N_2O is approx. 20% below the average, while the generation is approx. 20% above the average at the end of a campaign. The generation of N_2O is shown in the following figure:

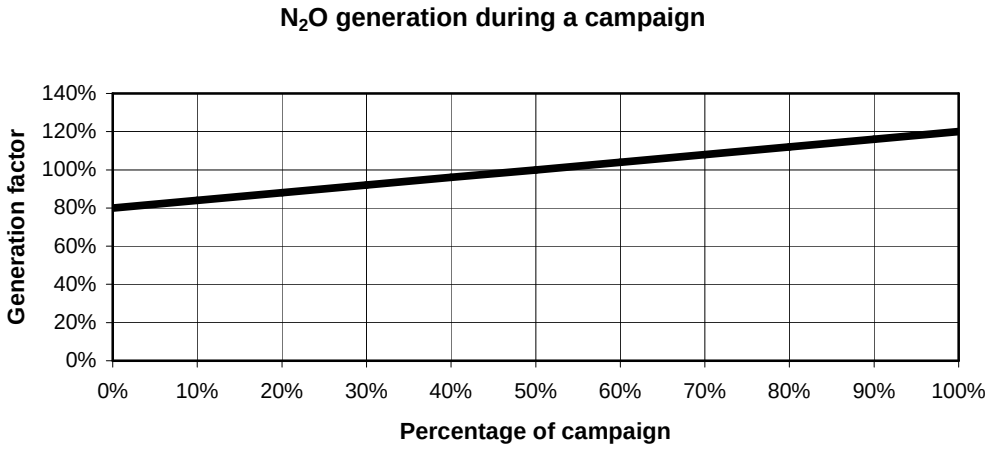

Figure 3 Typical N_2O generation as a function of time

The oxidation of ammonia (NH_3) is a strongly exothermic process. Transferring heat to a steam system cools down the gases from the catalytic reactor. Further cooling is obtained by transferring heat to the tail gas that leaves the absorbing column. The rest of the process heat is transferred to the cooling water circuit.

1.3. Oxidation of nitric oxide

After the catalytic formation of nitric oxide, the gases are cooled down in a cooler condenser and in some cases also compressed. This enhances the oxidation of nitric oxide to nitrogen dioxide. Due to the condensation of water, weak acid solution is formed. This solution is separated and led to the absorption tower. The nitrous gas from the cooler condenser is mixed with NOx-bearing secondary air from the bleaching section, which is sometimes housed within the absorption column.

In the absorption section of the absorption column, the remaining nitric oxide (NO) reacts non-catalytically with oxygen (O2) to form nitrogen dioxide (NO2):

$2\ NO + O_2 \leftrightarrow 2\ NO_2$

1.4. Absorption of nitrogen dioxide

Demineralised water or steam condensate is added at the top of the absorption column. The weak acid solution (approx. 43%) produced in the cooler condenser is also added to the absorption column. The nitrogen dioxide (NO_2) in the absorption column is led in counter-current flow with the water (H_2O), reacting to nitric acid (HNO_3) and nitric oxide (NO):

$3\ NO_2 + H_2O \leftrightarrow 2\ HNO_3 + NO$

Both the reactions are favored by a higher pressure and lower temperature. Besides that, both reactions are exothermic so continuous cooling is necessary. The nitric acid produced is rich in dissolved nitrogen oxides and is passed to a bleaching tower (or bleaching section within the absorption tower) where it is contacted with a counter current flow of air. The air and the nitrogen oxides that have been stripped out are used as secondary air, mixed with the gases leaving the cooler condenser and recycled to the absorption section.

An aqueous solution of nitric acid is withdrawn from the bottom of the absorption tower. The acid concentration can vary depending on the temperature, pressure, number of absorption stages and the concentration of nitrogen oxides entering the absorber. The gases that were not absorbed in the nitric acid solution leave the absorption column at the top, at a temperature of approx. 20-30 °C.

This gas mixture is commonly referred to as tail gas and is heated in the heat recovery section. The hot tail gas is in certain cases led through a NO_x abatement system and through a tail gas expander for energy recovery. The resulting expanded tail gas is vented through the stack.

1.5. Plant types in general

In general, two types of nitric acid plants can be distinguished: mono pressure and dual pressure plants. In mono pressure (single pressure) processes, ammonia oxidation and NO_2 absorption take place at the same pressure. In the past, nitric acid plants worked at atmospheric pressure or low pressure (mono pressure below 1,7 bar).

Nowadays, mono pressure/low pressure plants hardly exist anymore. Mono pressure/medium pressure plants (pressure between 1,7 bar and 6,5 bar) and mono pressure/high pressure plants (pressure between 6,5 bar and 13 bar) are commonly present. Most plants operate with dual pressure due to a higher yield and less environmental impact.

Older plants operate with low pressure/medium pressure, while more modern plants operate with medium pressure/high pressure. To make a higher pressure in the absorption section possible, a compressor is installed between the cooler condenser and the absorption column. The heat of compression is removed by heat exchange with the tail gas and/or by heat recovery in a steam boiler. A second cooler condenser reduces the temperature to 50 °C by cooling with water

The next figure gives a simplified scheme of a typical dual pressure plant.

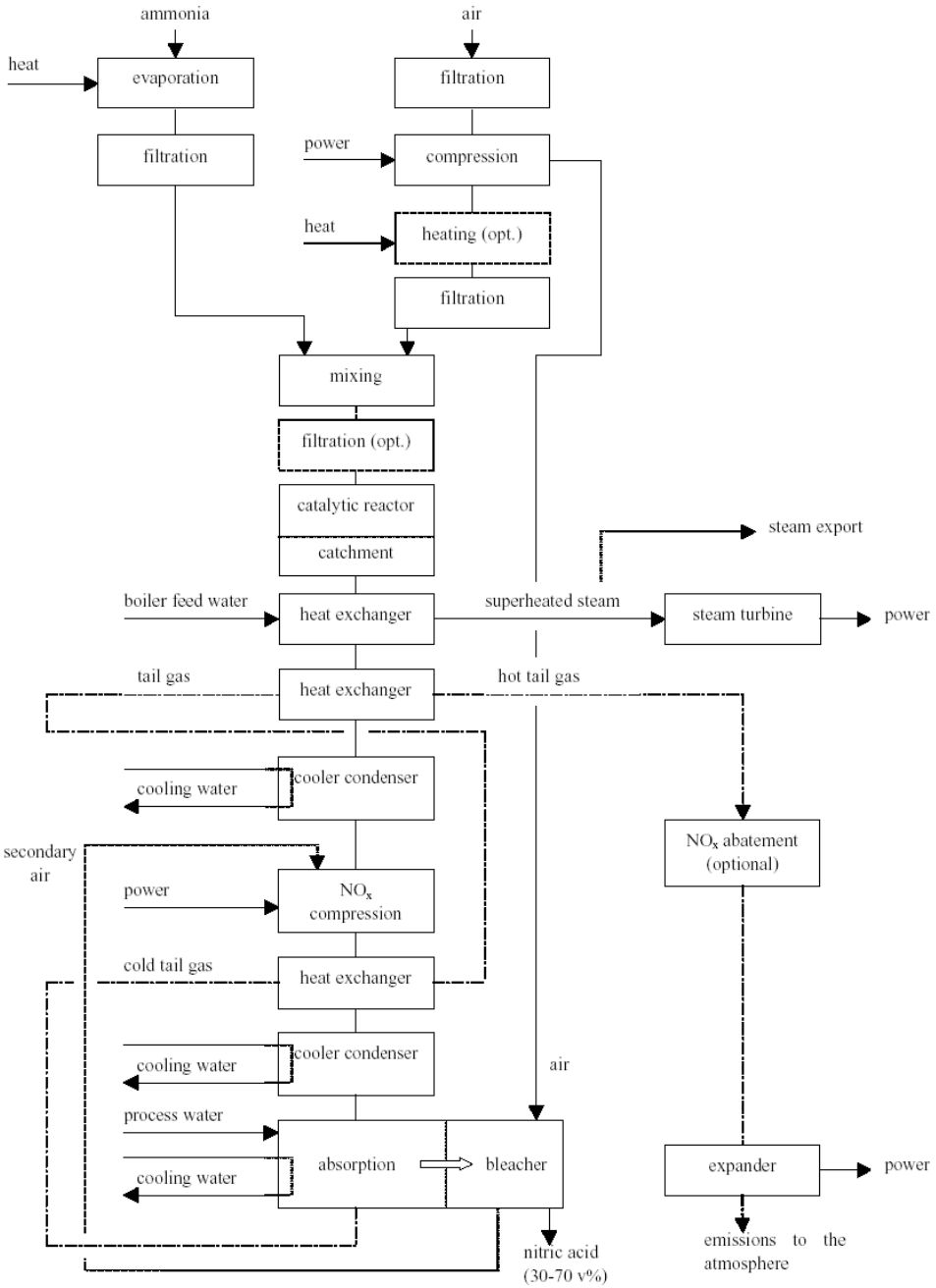

Figure 4 Dual pressure nitric acid plant

1.6. Agropolychim's nitric acid plant

The nitric acid plant at Agropolychim is a French made dual pressure plant commissioned in 1974. Basic key information of the plant is summarized in the following table:

Parameter	Grand Paroisse plant
Production in 2006	226.357 tons of nitric acid 100 v%
Production in 2005	311.265 tons of nitric acid 100 v%
Production in 2004	324.835 tons of nitric acid 100 v%
Production in 2003	223.815 tons of nitric acid 100 v%
Production in 2002	250.312 tons of nitric acid 100 v%
Production in 2001	325.728 tons of nitric acid 100 v%
Capacity	1.100 tons of nitric acid per day 100 v%
Oxidation	4 burners Pressure for catalytic oxidation is 3,5 bara Oxidation temperature is 835 ℃ Gauzes are knitted Burner diameter is 4,254 m Basket diameter is 4,254 m
Absorption	Pressure in absorption column is 12,8 bara Absorption temperature is 20-40 ℃
Abatement Technologies	None
Tail gas	NOx concentration is around 170-200 ppm_{vol} N_2O concentration is 895 ppmv (average) The temperature is 20 ℃ The flow is 148.500 Nm^3/h

Table 1 Key information for the plant (Grande Paroisse)

Figure 5 Photo of two of the four reactors (NH_3 burners)

1.7. N_2O Emissions

N_2O emissions vary significantly from one nitric acid plant to another. The emissions depend very much on site-specific factors such as plant design, process conditions and abatement technologies employed.

The following specification of N_2O emission from the plant is based on actual measured emissions and stated productions of 100 % nitric acid.

Subject	Production of Nitric Acid (tons/year)	Emission of N_2O (tons/year)	GWP factor	Annual emission of CO_2-equivalent (tons/year)
JI – Project	325.000	1.800	310	558.000

Table 2 Specifications of present N_2O emissions

The plant operate around the clock with planned shut down normally during the period June-August.

The N_2O generation at Agropolychim is 5,54 kg N_2O per ton 100% nitric acid, based on measurements.

The following figures show the N_2O generation from European nitric acid plants /9/:

European designed dual pressure plants: 2-10 kg N_2O / ton 100% HNO_3

Older plants pre 1975 without NSCR: 10-19 kg N_2O / ton 100% HNO_3

2. OBJECTIVE

2.1. Project Stakeholders

The following key stakeholders are identified for the project:

- Agropolychim JSC
- Government of Bulgaria (Ministry of Environment and Water)
- Government of Denmark (Ministry of the Environment, Danish Environmental Protection Agency)

2.2. The Nitrous Oxide Reduction in the Project of Agropolychim

The objective for the project is to reduce the N_2O emission by utilizing new developed technology (i.e. a catalyst) that converts the Nitrous Oxide into Oxygen and Nitrogen, which have zero Global Warming Potentials.

The new technology is applied by introducing a new catalyst bed, which is installed directly under the Platinum Gauze in the reactors. This new catalyst does not have any effects on the present production (no yield loss).

The technology is owned and patented by Heraeus. The technology has been installed in a few plants and operated without problems. The supplier guarantees the performance of the catalyst technology. The pressure drop over the catalyst is not significant and is normally about 15 mbar. The lifetime of the catalyst is expected to be maximum 3 years. In case the performance throughout this period is not satisfactory it will be replaced at the next possible shutdown.

The formation of N_2O is unavoidable, since the NO yield is limited. From an environmental point of view, emissions of N_2O need to be prevented. N_2O has a global Warming Potential (GWP) of 310 times greater than CO_2.

Only N_2O emissions from the nitric acid plant are determined, as only these emissions of Agropolychim are affected by the project. The project does not have any impact related to the energy consumption or generation, waste, raw material consumption and emissions other than N_2O.

A baseline N_2O emission factor (5.54 kg N_2O per tonne of nitric acid) was determined based on N_2O concentration measurements, tail gas flow rate, temperature and pressure and nitric acid production. The N_2O concentration of 860 ppmv measured in 2004 is comparable to the N_2O concentration measurements carried out at other plants *(see Annex I "Data calculations for emission baseline" – JI PDD, DEPA file M124/000-0043t, April 2004)*.

The catalyst for converting N_2O was supplied by Heraeus. This product was installed and operated without problems and great success in the Nitric Acid Plant.

The design and the installation of the catalyst were ready on September 15^{-th} 2005. The reductions of N_2O emissions started immediately following the installation of the new technology.


7 9 2005


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7 9 2005

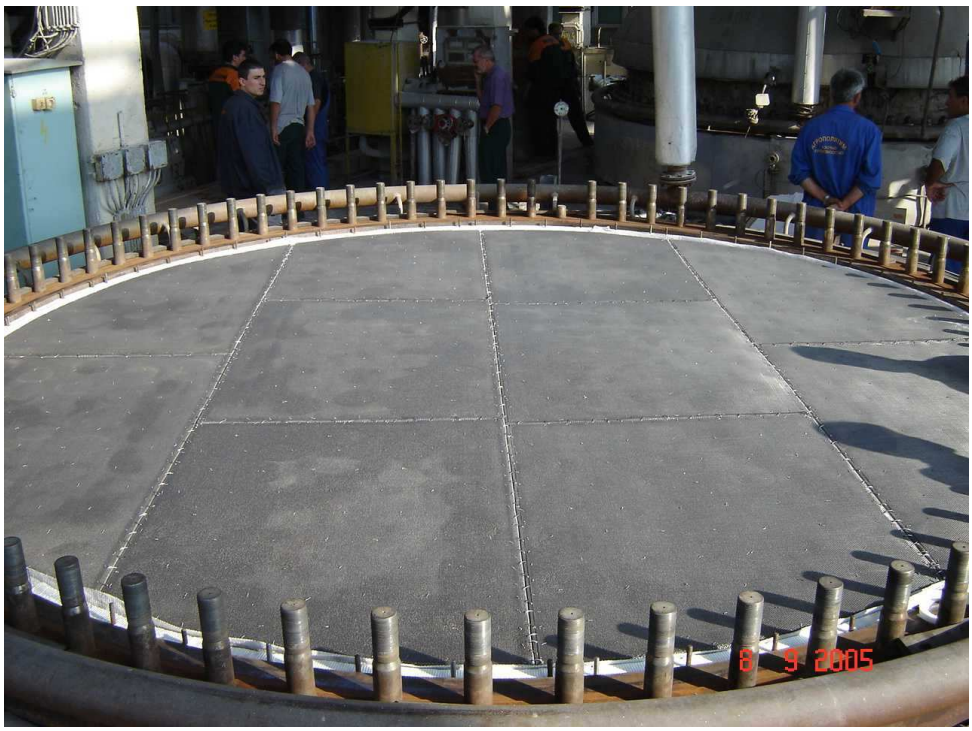

Figure 6 Installing of the catalyst for converting N_2O

2.3. GHG Emission Accounting

The catalyst provided reduction of N_2O concentration in the tail gas from 860 ppmv to 120-180 ppmv and is expected to reduce Agropolychim's emissions by 11000 tonnes N_2O (i.e. about 3 410 000 tonnes CO_2eq.) within the period 2005-2012.

2.4. Project sustainability

The plant is functional and running and is well maintained. Many investments are under way. The sustainability of the project is related to future maintenance of the plant and the situation of the fertilizer market.

There are no significant risks related to the project in technical terms, but it is essential that the plant keeps on producing nitric acid in the future. The risks are more related to the prediction of the market situation for fertilisers in the future and the company's investment plans for rehabilitation of the plant.

3. DESCRIPTION OF PLANT PERFORMANCE

3.1. Production and Key figures

The plant operates around the clock with a planned shut down for the annual maintenance normally from June to August.

The reduction of N_2O emissions started immediately following the installation of the new selective catalyst (*15-th September 2005*).

Within the period 01.01.2006 - 31.12.2006 were produced 226,356.7t 100% HNO_3 under the conditions described below:

Subject	**Value**
Produced of HNO_3	226,356.7tons of nitric acid 100 v%
Hour production of HNO_3	41,863 tons of nitric acid 100 v%/hour
Real time operation period	5 378 h
Idle time of installation	3382 h
O_2 in tail gas (average)	3,55 v.%
NO_x in tail gas (average concentration)	188,3 ppm_{vol}
N_2O in tail gas (average concentration)	212,6 ppm_{vol}
Tail gas temperature (average)	12,8 ^oC
Tail gas flow (average)	146.600 Nm^3/h

Table 4 Operation conditions in Nitric Acid Plant for the period 01.01.2006 - 31.12.2006

3.2. Results

The monitoring results give information about the GHG emission reductions and GHG emissions, generated for the period 01.01.2006 - 31.12.2006.

The baseline N_2O generation at Agropolychim is accepted to be 5,54 kg/N_2O per ton 100 % nitric acid.

The monitoring results are presented according to the requirements (Annex IV from PDD) shown in ***Annex I and Annex II*** *(Monitoring Data for the period 01.01.2006 - 31.12.2006 and N_2O Emission Reduction for the period 01.01.2006 - 31.12.2006).*

3.3. Environmental impact

Since the project does not affect the production and near surroundings, no environmental impacts are expected from the project.

The Nitric Acid Plant in Agropolychim JCS at Devnia complies with the relevant environmental legislation in Bulgaria.

4. MONITORING PLAN

4.1. Objective of the Monitoring Plan

The objective of the Monitor Plan (MP) is to provide a practical framework for collection and management of performance data, in order to monitor and verify the GHG emission reduction generated by the JI-project. The project comprises reduction of nitrous oxide by means of a new catalyst introduced to the reactors of the nitric acid plant.

The MP has been developed in accordance with the French standard BP X 30-331 “Protocol for quantification for nitrous oxide emissions in the manufacture of nitric acid”.

This MP provides monitoring methodologies for monitoring and estimation of GHG emission reduction referring to the emission baseline.

The monitoring results are filled in the forms, according to requirement in Annex IV from PDD (Monitoring Plan) for the entire monitoring period.

The monitoring plan is based on an on-line measurement of the tail gas and the production flow. Emission factors are calculated in the baseline and measured on-line continuously. The on-line data are filed on a PC and two hard disk and monthly recording on a CD do a back up.

The proposed monitoring methodology, data collection, data management and guidelines can only be changed after agreement with the Bulgarian Government, the Danish Government and the Verifier.

4.2. Requirements for the Monitoring Activities

1. Monitoring of the GHG emission reduction generated by the project shall be performed by data collection at Agropolychim’s nitric acid plant.
2. Monitoring reports include the actual GHG emission reduction and GHG emission generated by the project and should be issued annually during the entire crediting period.
3. Based on monitoring results the GHG emission reductions and GHG emissions shall be calculated and submitted for verification as approved ERUs.
4. Persons trained in the monitoring procedure shall conduct the monitoring.
5. QA system shall be implemented to secure accurate and transparent monitoring.
6. The governing language is English in monitoring reports.
7. The outcome of the MP shall enable a legacy entity to accrediting the ERUs generated by the project according to requirements of the Executive Board/JI Supervisory Committee, the Bulgarian government and the Danish government.
8. The monitoring procedures shall follow the guidelines in the Marrakech Accords.
9. Draft versions of the annual monitoring reports shall be submitted to the Bulgarian government and the Danish Government or their representatives before issuing the final version. The annual monitoring reports shall be issued to:

Receiver of annual reports	Draft version monitoring report	Final version monitoring report
Bulgarian Government	2 copies	2 copies
Danish Government	2 copies	2 copies
Verifier	none	2 copies

Table 5 Monitoring reports

4.3. General information

The monitoring plan is based on an on-line measurement of the tail gas and the production flow. Emission factors are calculated in the baseline and measured on-line continuously. The on-line data are filed on a PC and two hard disk and monthly recording on a CD do a back up.

The emission reduction is calculated as the difference between the emission factor (baseline: 5,54 kg/N_2O per ton 100 % nitric acid) and the actual emission factor multiplied by the actual production.

The monitoring methodology reflects good practice and is in line with the approved monitoring methodologies for the Clean Development Mechanism.

4.4. Monitoring equipment

N_2O emissions are continuously measured after the installation of the catalyst. The monitoring methodology was built upon the on-line measurements of:

i) N_2O concentration (IR measuring technology - Infrared Analyzer Module, manufactured by Hartmann & Braun, Frankfurt, Germany);

ii) Tail gas flow (system for measuring of tail gas flow – Durag system D-FL 100, with transmitters for temperature and pressure);

iii) Temperature of tail gas;

iv) Absolute pressure of tail gas;

v) Concentration of O_2 in tail gas;

vi) Nitric acid production /*as 100 % HNO_3*/ (mass-flow meter, manufactured by Yokogava).

4.5. Methodology

4.5.1. Emission baseline

The baseline is based on the assumptions of an annual production of 325.000 tons of 100% HNO_3 and an average concentration of N_2O of 250 ppm in the tail gas, after implementation.

A baseline N_2O emission factor (5.54 kg N_2O per tonne of nitric acid) was determined based on N_2O concentration measurements, tail gas flow rate, temperature and pressure and nitric acid production. The N_2O concentration of 860 ppmv measured in 2004 is comparable to the N_2O concentration measurements carried out at other plants *(see Annex I "Data calculations for emission baseline" – JI PDD, DEPA file M124/000-0043t, April 2004)*.

4.5.2. Emission factors

The GWP used for N_2O is 310 times greater than CO_2.

The following conversion factors from ppm to mg/Nm³ (Nm³: 1 m³ air at 273 K, 101.3 kPa, dry) for various emissions to air:

Emission	Conversion factor
N_2O	1,96

Table 6 Conversion factors

4.5.3. Actual emission reduction

The emission reduction is calculated as the difference between the emission factor (baseline: 5,54 kg/N_2O per ton 100 % nitric acid) and the actual emission factor multiplied by the actual production.

The actual emission reduction (over a period of monitoring) is obtained by the following equations:

The *emission factors* are calculated as follows (both before and after the project):

$$F_{N2O} = \frac{1}{t} x \sum_{0}^{t} \frac{C_{N2O} x Q_S \ x \ 44}{P_{N2O} x V_M} x 10^{-6} \ \Delta t$$

Where

F_{N2O}	kg/T	N_2O emission in kg per ton of 100% HNO_3 produced
t	hours	Period of time
C_{N2O}	ppm	N_2O concentration in tail gas
Q_S	Nm³/h	Output air flow (tail gas)
V_M	22,4 l/mol	Molar volume N_2O (normal conditions)
P_{N2O}	T/h	Production of 100% HNO_3

The actual *emission reduction* is calculated as follows:

$$ERU = \frac{GWP}{1.000} x \sum_{0}^{t} \left(F_{N2O\ baseline} - F_{N2O\ actual} \right) x \ P_{N2O} \ \Delta t$$

Where

ERU	$CO_{2\ eq.}$	Emission Reduction Units
GWP	310	Global Warming Potential for N_2O
$F_{N2O\ baseline}$	5,54 kg/T	N_2O emission in kg per ton of 100% HNO_3 produced (baseline)
$F_{N2O\ actual}$	kg/T	N_2O emission in kg per ton of 100% HNO_3 produced (actual)
t	hours	Period of time
P_{N2O}	T/h	Production of 100% HNO_3 (actual)

The actual monitoring results are filled in the forms, according to requirement in Annex IV from PDD (Monitoring Plan) for the entire monitoring period (01.01.2006 - 31.12.2006) – **see Annex II**.

4.6. Responsibility

Agropolychim is responsible for the monitoring and reporting in accordance with the guidelines of the monitoring plan. The authority and the responsibility for the project management, operation, maintenance, monitoring and reporting are clearly defined.

The technology supplier (Heraeus) was responsible for ensuring the appropriate installation, operation and maintenance of the catalyst, including the necessary renewal of the catalyst.

The supplier of the monitoring equipment (ABB Automation Products, Germany) was responsible for the installation, test and check for compliance of the monitoring devices and whether the reporting of the emissions reductions were carried out according to the monitoring plan.

4.7. Quality Assurance System

The quality assurance system secures that monitoring procedures and requirements are followed. The QA system is not according to any ISO 9000 or similar standards. The QA system comprises inspection of the monitoring procedure by an independent third party. The management of Agropolychim is responsible for QA system.

The QA system can be changed according to request from the verifier. After discussions with verifier it was agreed to propose change in the calibration period of meters from one to two years. This has been also recommended by equipment supplier and the independent third party.

QA – Procedure		Time for Inspection	Inspection
1.0	Calibration of meters and transmitters All flow meters and transmitters have to calibrated and checked at least ones every year during planned shut down. Calibration reports must be obtained, including name, official company registration number, address, phone and fax number.	Annual	Independent third party
2.0	Control of meters and transmitters	Weekly	Operational staff
3.0	Control of monitoring data The data and the calculations have to be controlled every day, to secure minimum errors	Daily	Operational staff
4.0	Observations, comments, control of calibration reports and measurements of N_2O concentration.	Annual	Independent third party
5.0	Training of staff members	Before commissioning of project and hereafter annually	Management

Table 7 Quality Assurance System

4.8. Training and instruction of operational staff

Training of operational staff members was conducted before commissioning of project. Training shall be replicated, when needed, in order to secure full understanding of the monitoring procedures and to secure the highest possible reliability of the monitoring results.

The management is responsible for training and instruction of operational staff.

4.9. Summary - Management of the monitoring plan

The summary aims to highlight the key elements and responsibilities of the management of the MP.

Obligations	**Utility**	**Independent third party**	**Verifier**
Monitoring Plan	Review of the MP and comments. Review management of monitoring plan Preparation of monitoring procedures Training of staff members performing monitoring procedures Updating of MP if necessary Preparation for data collection, data handling and data storing	Elaboration of inspection reports every 6 months	Review of MP and comments Review of management system
Data collection	Review of methods and system for data collection system including updating of these if necessary		Review of methods and system for data collection including comments
Data handling	Appointment of person(s) responsible for data handling		Review of data handling systems
Data storing	Establishment of data storing system for written and digital data Establishment of back-up system for data storing		Review of data storing system including backup systems
Monitoring	Timetable for monitoring activities		Review and assist elaborating timetables, monitoring sheets etc.
Reporting	Establish framework for reporting which fulfil requirements in MP		Review of framework for reporting
Instruction	Instruction of staff members		Assist during performance of the training

Table 8 Management of Monitoring Plan

Annex I

Monitoring Data for the period 01.01.2006 - 31.12.2006

№	дата / час date / hour	N_2O изм. meas. mg/Nm³	N_2O изм. meas. ppmv.	$O_{2\ (газ)}$ $O_{2\ (gas)}$ об.% Vol.%	Температура Temperature °C	Разход Flow Nm³/h	Налягане Pressure hPa
1	2	3	4	5	6	7	8
1	01.1.2006 00:00	344.5	175.8	4.63	8	146095	1061
2	02.1.2006 00:00	371.1	189.3	4.13	9.9	147468	1060
3	03.1.2006 00:00	373.2	190.4	4.08	9.6	147539	1059
4	04.1.2006 00:00	368.7	188.1	4.08	9.7	147708	1062
5	05.1.2006 00:00	376.5	192.1	4.13	9.5	147957	1060
6	06.1.2006 00:00	354.1	180.7	4.61	8.3	147033	1059
7	07.1.2006 00:00	349.2	178.2	4.95	5.3	148578	1064
8	08.1.2006 00:00	345.5	176.3	4.98	5.7	148538	1067
9	09.1.2006 00:00	376.3	192	4.41	7.7	148656	1067
10	10.1.2006 00:00	387.1	197.5	4.12	8.5	148733	1066
11	11.1.2006 00:00	385.1	196.5	4.22	7.9	148969	1066
12	12.1.2006 00:00	388.4	198.2	4.31	7.2	149351	1067
13	13.1.2006 00:00	389.8	198.9	4.3	7.2	149607	1068
14	14.1.2006 00:00	389.6	198.8	4.34	8.1	149383	1070
15	15.1.2006 00:00	393.3	200.7	4.35	7.2	149864	1069
16	16.1.2006 00:00	415.1	211.8	3.53	10	148218	1064
17	17.1.2006 00:00	459.4	234.4	2.76	12.3	148957	1061
18	18.1.2006 00:00	467.9	238.7	2.78	13.1	148920	1055
19	19.1.2006 00:00	462	235.7	2.7	12.5	148455	1052
20	20.1.2006 00:00	454.4	231.8	3.01	11.6	150184	1061
21	21.1.2006 00:00	455.9	232.6	3	12.2	149842	1061
22	22.1.2006 00:00	454.1	231.7	2.93	11.7	150006	1060

23	23.1.2006 00:00	465.8	237.7	3.11	9	152520	1067
24	24.1.2006 00:00	416.3	212.4	2.72	13.2	143217	1069
25	25.1.2006 00:00	421.4	215	2.86	13.6	141407	1061
26	26.1.2006 00:00	422.6	215.6	3.44	11.2	143992	1061
27	27.1.2006 00:00	411.3	209.8	4.04	9.1	146728	1066
28	28.1.2006 00:00	408.3	208.3	4	9.9	145842	1065
29	29.1.2006 00:00	412.2	210.3	3.99	9.3	146200	1065
30	30.1.2006 00:00	405.5	206.9	4.01	9.8	145714	1063
31	31.1.2006 00:00	398.3	203.2	3.96	10.9	143669	1057
32	01.2.2006 00:00	398.7	203.4	3.9	11	143726	1059
33	02.2.2006 00:00	403.2	205.7	3.92	11.3	143475	1056
34	03.2.2006 00:00	401.5	204.8	3.84	11.5	143161	1055
35	04.2.2006 00:00	401.5	204.8	3.84	11.5	143161	1055
36	05.2.2006 00:00	401.5	204.8	3.84	11.5	143161	1055
37	06.2.2006 00:00	406.8	207.6	3.93	9.3	144410	1056
38	07.2.2006 00:00	409.2	208.8	4.01	8.9	144884	1058
39	08.2.2006 00:00	405.2	206.7	3.81	9.9	143944	1052
40	09.2.2006 00:00	399.7	203.9	3.65	10.3	142958	1050
41	10.2.2006 00:00	406.6	207.4	3.55	11.2	142731	1051
42	11.2.2006 00:00	413.1	210.8	3.73	10.6	143559	1055
43	12.2.2006 00:00	414.1	211.3	3.85	10.5	143985	1057
44	13.2.2006 00:00	384.7	196.3	4.86	7.4	144065	1058
45	14.2.2006 00:00	366.1	186.8	5.45	6.2	144038	1060
46	15.2.2006 00:00	365	186.2	5.42	5.9	144092	1060
47	16.2.2006 00:00	431.1	219.9	4.36	7.4	146222	1054
48	17.2.2006 00:00	277.7	141.7	11.01	8.7	80469	1052
49	18.2.2006 00:00	0	0	0	0	0	1053
50	19.2.2006 00:00	0	0	0	0	0	1055
51	20.2.2006 00:00	429.4	219.1	5.25	5.3	144867	1059
52	21.2.2006 00:00	420.7	214.6	5.16	7	144067	1060
53	22.2.2006 00:00	417.4	213	5.18	4.8	144650	1060
54	23.2.2006 00:00	420.2	214.4	5.23	4.5	145041	1062

55	24.2.2006 00:00	416.2	212.3	5.19	5.5	144885	1058
56	25.2.2006 00:00	422.4	215.5	4.98	6.8	144095	1055
57	26.2.2006 00:00	418.9	213.7	4.9	6.6	143693	1052
58	27.2.2006 00:00	432.4	220.6	4.7	5.9	145440	1054
59	28.2.2006 00:00	440	224.5	4.42	7.3	145389	1051
60	01.3.2006 00:00	445.7	227.4	4.33	6.8	145238	1049
61	02.3.2006 00:00	446.4	227.8	4.36	6.5	145963	1052
62	03.3.2006 00:00	443.6	226.3	4.33	6	145814	1052
63	04.3.2006 00:00	450.4	229.8	4.47	5.8	146425	1054
64	05.3.2006 00:00	442.4	225.7	4.4	6.4	145480	1051
65	06.3.2006 00:00	469.2	239.4	4.06	8.4	145283	1050
66	07.3.2006 00:00	477.6	243.7	4.09	8.5	146704	1048
67	08.3.2006 00:00	488.1	249	4.28	7.3	147808	1051
68	09.3.2006 00:00	491.4	250.7	4.29	7.3	148463	1056
69	10.3.2006 00:00	491.7	250.9	4.2	7.3	148136	1056
70	11.3.2006 00:00	485.1	247.5	4.02	9.2	146195	1050
71	12.3.2006 00:00	489.1	249.5	4.08	9	146253	1050
72	13.3.2006 00:00	489.3	249.6	4.01	8.4	146716	1050
73	14.3.2006 00:00	501.5	255.9	4.02	7.5	147756	1053
74	15.3.2006 00:00	500.4	255.3	4.02	8.2	147979	1058
75	16.3.2006 00:00	504.4	257.3	4.09	7.1	148482	1060
76	17.3.2006 00:00	503.1	256.7	4.23	7.3	148539	1060
77	18.3.2006 00:00	505.2	257.8	4.18	6.8	148461	1058
78	19.3.2006 00:00	497.9	254	4.16	6.7	147957	1058
79	20.3.2006 00:00	552.9	282.1	3.29	9	148283	1056
80	21.3.2006 00:00	583.5	297.7	2.84	11.4	148666	1056
81	22.3.2006 00:00	577.9	294.8	2.75	11.6	148183	1056
82	23.3.2006 00:00	574.3	293	2.63	11.9	147241	1049
83	24.3.2006 00:00	605.5	308.9	2.92	11.1	149446	1057
84	25.3.2006 00:00	601.7	307	2.89	10.8	149705	1061
85	26.3.2006 00:00	534	272.4	4.11	7.3	147806	1061
86	27.3.2006 00:00	482.5	246.2	4.64	6.4	146474	1060

87	28.3.2006 00:00	479.6	244.7	4.7	6.5	146123	1057
88	29.3.2006 00:00	478.5	244.1	4.5	8.3	144474	1054
89	30.3.2006 00:00	483.6	246.7	4.58	6.3	145821	1058
90	31.3.2006 00:00	484.6	247.2	4.62	6.4	145906	1059
91	01.4.2006 00:00	496.4	253.3	4.58	6.9	145638	1059
92	02.4.2006 00:00	488.7	249.3	4.54	7.2	145747	1060
93	03.4.2006 00:00	492.1	251.1	4.59	6.5	146060	1058
94	04.4.2006 00:00	495.8	253	4.48	7.2	145611	1057
95	05.4.2006 00:00	227	115.8	13.62	17.1	98905	1056
96	06.4.2006 00:00	0	0	0	0	0	1054
97	07.4.2006 00:00	0	0	0	0	0	1053
98	08.4.2006 00:00	0	0	0	0	0	1056
99	09.4.2006 00:00	0	0	0	0	0	1060
100	10.4.2006 00:00	0	0	0	0	0	1059
101	11.4.2006 00:00	0	0	0	0	0	1054
102	12.4.2006 00:00	0	0	0	0	0	1045
103	13.4.2006 00:00	0	0	0	0	0	1048
104	14.4.2006 00:00	0	0	0	0	0	1055
105	15.4.2006 00:00	74.4	38	18.46	18.8	81645	1060
106	16.4.2006 00:00	650	331.6	2.91	12.9	148643	1061
107	17.4.2006 00:00	601.4	306.8	3.26	13.1	145504	1057
108	18.4.2006 00:00	575.4	293.6	3.53	11.9	144897	1058
109	19.4.2006 00:00	567.9	289.7	3.71	9.3	146067	1057
110	20.4.2006 00:00	564.3	287.9	3.87	8.9	146569	1058
111	21.4.2006 00:00	550.2	280.7	4.23	8.2	144750	1060
112	22.4.2006 00:00	515.4	263	4.64	8.7	142280	1059
113	23.4.2006 00:00	518.7	264.6	4.69	8	142642	1060
114	24.4.2006 00:00	513.7	262.1	4.72	7.3	143088	1063
115	25.4.2006 00:00	524.3	267.5	4.91	6.5	143993	1065
116	26.4.2006 00:00	513.8	262.1	4.9	6.6	143365	1063
117	27.4.2006 00:00	518.8	264.7	4.82	6.7	143117	1061
118	28.4.2006 00:00	513.7	262.1	4.68	9	142299	1059

119	29.4.2006 00:00	517.6	264.1	4.65	8.3	142270	1058
120	30.4.2006 00:00	527	268.9	4.49	8.9	142268	1060
121	01.5.2006 00:00	530.8	270.8	4.54	8.4	142718	1062
122	02.5.2006 00:00	541	276	4.65	8.5	143012	1065
123	03.5.2006 00:00	535.6	273.3	4.74	7.5	143671	1067
124	04.5.2006 00:00	532.6	271.7	4.89	7.7	143255	1066
125	05.5.2006 00:00	532.3	271.6	4.74	8	142760	1064
126	06.5.2006 00:00	536.6	273.8	4.6	7.9	142451	1062
127	07.5.2006 00:00	542.2	276.6	4.59	8	142058	1060
128	08.5.2006 00:00	542.6	276.8	4.51	8.2	141569	1058
129	09.5.2006 00:00	542.1	276.6	4.45	7.7	141544	1059
130	10.5.2006 00:00	541.5	276.3	4.35	8.8	140739	1057
131	11.5.2006 00:00	543.6	277.3	4.32	7.8	141206	1056
132	12.5.2006 00:00	552.6	281.9	4.62	7.5	142114	1062
133	13.5.2006 00:00	564.4	288	4.69	7.4	142271	1066
134	14.5.2006 00:00	561.4	286.4	4.56	7.5	142108	1064
135	15.5.2006 00:00	557.1	284.2	4.56	7.3	142108	1062
136	16.5.2006 00:00	569.1	290.4	4.55	8.4	141846	1064
137	17.5.2006 00:00	572.2	291.9	4.4	9.5	140677	1063
138	18.5.2006 00:00	568.2	289.9	4.41	9.5	140767	1062
139	19.5.2006 00:00	577.7	294.7	4.29	11.5	140128	1062
140	20.5.2006 00:00	571.8	291.7	4.11	13.1	138502	1059
141	21.5.2006 00:00	582.6	297.2	4.17	12.8	138357	1059
142	22.5.2006 00:00	583.3	297.6	4.07	13.8	138821	1063
143	23.5.2006 00:00	589.2	300.6	4.14	13.7	138957	1064
144	24.5.2006 00:00	592.5	302.3	4.28	12.7	139441	1065
145	25.5.2006 00:00	598.6	305.4	4.23	12.3	139424	1062
146	26.5.2006 00:00	609.3	310.9	4.6	9.2	141587	1063
147	27.5.2006 00:00	592.3	302.2	4.59	9.3	141387	1063
148	28.5.2006 00:00	576.2	294	4.67	8.2	141887	1063
149	29.5.2006 00:00	577.5	294.6	4.69	9.6	140759	1059
150	30.5.2006 00:00	577	294.4	4.27	12.8	139109	1054

151	31.5.2006 00:00	582.4	297.1	4.42	10.1	140833	1054
152	01.6.2006 00:00	653.4	333.4	5.69	7.8	142667	1062
153	02.6.2006 00:00	549.8	280.5	6.58	14.6	130681	1058
154	03.6.2006 00:00	436.6	222.8	11.49	25.3	108725	1058
155	04.6.2006 00:00	744.9	380.1	3.04	15	145823	1059
156	05.6.2006 00:00	677.5	345.7	4.67	8.4	146268	1062
157	06.6.2006 00:00	230.2	117.4	16.89	23.7	83127	1065
158	07.6.2006 00:00	0	0	0	0	0	1062
159	08.6.2006 00:00	0	0	0	0	0	1060
160	09.6.2006 00:00	0	0	0	0	0	1061
161	10.6.2006 00:00	0	0	0	0	0	1062
162	11.6.2006 00:00	0	0	0	0	0	1065
163	12.6.2006 00:00	0	0	0	0	0	1064
164	13.6.2006 00:00	0	0	0	0	0	1062
165	14.6.2006 00:00	0	0	0	0	0	1059
166	15.6.2006 00:00	0	0	0	0	0	1057
167	16.6.2006 00:00	0	0	0	0	0	1060
168	17.6.2006 00:00	0	0	0	0	0	1062
169	18.6.2006 00:00	0	0	0	0	0	1063
170	19.6.2006 00:00	0	0	0	0	0	1062
171	20.6.2006 00:00	0	0	0	0	0	1061
172	21.6.2006 00:00	0	0	0	0	0	1060
173	22.6.2006 00:00	0	0	0	0	0	1061
174	23.6.2006 00:00	0	0	0	0	0	1060
175	24.6.2006 00:00	0	0	0	0	0	1060
176	25.6.2006 00:00	0	0	0	0	0	1062
177	26.6.2006 00:00	0	0	0	0	0	1063
178	27.6.2006 00:00	0	0	0	0	0	1062
179	28.6.2006 00:00	0	0	0	0	0	1061
180	29.6.2006 00:00	0	0	0	0	0	1062
181	30.6.2006 00:00	0	0	0	0	0	1062
182	01.7.2006 00:00	0	0	0	0	0	1060

183	02.7.2006 00:00	0	0	0	0	0	1061
184	03.7.2006 00:00	0	0	0	0	0	1063
185	04.7.2006 00:00	0	0	0	0	0	1063
186	05.7.2006 00:00	0	0	0	0	0	1064
187	06.7.2006 00:00	0	0	0	0	0	1065
188	07.7.2006 00:00	0	0	0	0	0	1063
189	08.7.2006 00:00	0	0	0	0	0	1061
190	09.7.2006 00:00	0	0	0	0	0	1062
191	10.7.2006 00:00	0	0	0	0	0	1063
192	11.7.2006 00:00	0	0	0	0	0	1064
193	12.7.2006 00:00	0	0	0	0	0	1061
194	13.7.2006 00:00	0	0	0	0	0	1060
195	14.7.2006 00:00	0	0	0	0	0	1060
196	15.7.2006 00:00	0	0	0	0	0	1060
197	16.7.2006 00:00	0	0	0	0	0	1062
198	17.7.2006 00:00	0	0	0	0	0	1061
199	18.7.2006 00:00	0	0	0	0	0	1063
200	19.7.2006 00:00	0	0	0	0	0	1064
201	20.7.2006 00:00	0	0	0	0	0	1065
202	21.7.2006 00:00	0	0	0	0	0	1065
203	22.7.2006 00:00	0	0	0	0	0	1063
204	23.7.2006 00:00	0	0	0	0	0	1061
205	24.7.2006 00:00	0	0	0	0	0	1062
206	25.7.2006 00:00	0	0	0	0	0	1062
207	26.7.2006 00:00	0	0	0	0	0	1061
208	27.7.2006 00:00	0	0	0	0	0	1060
209	28.7.2006 00:00	0	0	0	0	0	1057
210	29.7.2006 00:00	0	0	0	0	0	1057
211	30.7.2006 00:00	0	0	0	0	0	1058
212	31.7.2006 00:00	0	0	0	0	0	1057
213	01.8.2006 00:00	0	0	0	0	0	1058
214	02.8.2006 00:00	0	0	0	0	0	1056

215	03.8.2006 00:00	0	0	0	0	0	1056
216	04.8.2006 00:00	0	0	0	0	0	1055
217	05.8.2006 00:00	0	0	0	0	0	1055
218	06.8.2006 00:00	0	0	0	0	0	1057
219	07.8.2006 00:00	0	0	0	0	0	1054
220	08.8.2006 00:00	0	0	0	0	0	1052
221	09.8.2006 00:00	0	0	0	0	0	1056
222	10.8.2006 00:00	0	0	0	0	0	1056
223	11.8.2006 00:00	0	0	0	0	0	1054
224	12.8.2006 00:00	0	0	0	0	0	1057
225	13.8.2006 00:00	0	0	0	0	0	1058
226	14.8.2006 00:00	0	0	0	0	0	1058
227	15.8.2006 00:00	0	0	0	0	0	1060
228	16.8.2006 00:00	0	0	0	0	0	1061
229	17.8.2006 00:00	0	0	0	0	0	1061
230	18.8.2006 00:00		0	0	0	0	
231	19.8.2006 00:00		0	0	0	0	
232	20.8.2006 00:00		0	0	0	0	
233	21.8.2006 00:00	0	0	0	0	0	1061
234	22.8.2006 00:00	0	0	0	0	0	1058
235	23.8.2006 00:00	0	0	0	0	0	1059
236	24.8.2006 00:00	0	0	0	0	0	1059
237	25.8.2006 00:00	0	0	0	0	0	1058
238	26.8.2006 00:00	0	0	0	0	0	1057
239	27.8.2006 00:00	0	0	0	0	0	1057
240	28.8.2006 00:00	153.3	78.2	6.92	31	136979	1056
241	29.8.2006 00:00	168.1	85.8	2.13	21.7	145656	1055
242	30.8.2006 00:00	145.7	74.3	2.13	22.1	145476	1056
243	31.8.2006 00:00	137.1	69.9	2.23	18	147840	1060
244	01.9.2006 00:00	133.5	68.1	2.31	18.2	148140	1061
245	02.9.2006 00:00	134.8	68.8	2.3	18.3	148084	1061
246	03.9.2006 00:00	141.3	72.1	2.19	19.5	147647	1065

247	04.9.2006 00:00	150.1	76.6	2.07	22.5	145802	1065
248	05.9.2006 00:00	158.4	80.8	2.07	23.6	145082	1065
249	06.9.2006 00:00	168.3	85.9	2.23	20.5	147086	1064
250	07.9.2006 00:00	173.4	88.5	2.26	20.3	147343	1065
251	08.9.2006 00:00	158.6	80.9	2.97	18.8	142595	1064
252	09.9.2006 00:00	130.7	66.7	4.14	13.3	139814	1066
253	10.9.2006 00:00	136.6	69.7	4.02	12.7	140388	1071
254	11.9.2006 00:00	143	73	3.82	12.9	140289	1070
255	12.9.2006 00:00	150.6	76.8	3.67	14	139541	1069
256	13.9.2006 00:00	155.4	79.3	3.64	14.5	139437	1069
257	14.9.2006 00:00	189	96.4	2.86	15.7	145361	1067
258	15.9.2006 00:00	210.8	107.6	2.52	16.8	148406	1064
259	16.9.2006 00:00	215.7	110.1	2.51	17	148465	1065
260	17.9.2006 00:00	220.8	112.7	2.52	18	147956	1066
261	18.9.2006 00:00	229.4	117	2.46	18.5	147388	1062
262	19.9.2006 00:00	235.9	120.4	2.43	19.7	146568	1059
263	20.9.2006 00:00	242.3	123.6	2.38	19.1	146697	1060
264	21.9.2006 00:00	245.9	125.5	2.41	18.5	147111	1062
265	22.9.2006 00:00	255.4	130.3	2.47	16.1	148725	1060
266	23.9.2006 00:00	261.4	133.4	2.49	16.1	148639	1060
267	24.9.2006 00:00	232.6	118.7	3.26	15.2	144871	1061
268	25.9.2006 00:00	200.9	102.5	4.27	11.9	141498	1061
269	26.9.2006 00:00	214.2	109.3	4.04	13.4	141719	1061
270	27.9.2006 00:00	261.4	133.4	3.28	16.5	145295	1060
271	28.9.2006 00:00	274.2	139.9	2.74	20.9	146829	1059
272	29.9.2006 00:00	277.4	141.5	2.91	19.3	147649	1059
273	30.9.2006 00:00	281.3	143.5	2.93	18.9	148120	1063
274	01.10.2006 00:00	284.9	145.4	3.22	17.1	149319	1065
275	02.10.2006 00:00	236.4	120.6	5.59	20.9	136066	1064
276	03.10.2006 00:00	0	0	0	0	0	1060
277	04.10.2006 00:00	0	0	0	0	0	1059
278	05.10.2006 00:00	130.8	66.7	14.28	26.9	105569	1060

279	06.10.2006 00:00	345.8	176.4	2.55	19.9	148244	1062
280	07.10.2006 00:00	342.3	174.6	2.44	19.1	148754	1062
281	08.10.2006 00:00	343.7	175.4	2.45	18.7	149102	1062
282	09.10.2006 00:00	335.8	171.3	2.78	17.8	149968	1065
283	10.10.2006 00:00	321	163.8	3.26	16.5	150716	1066
284	11.10.2006 00:00	330.5	168.6	3.12	16.1	151040	1066
285	12.10.2006 00:00	336.6	171.7	3.22	15.8	151107	1067
286	13.10.2006 00:00	335.6	171.2	3.27	15.1	151728	1068
287	14.10.2006 00:00	331.8	169.3	3.14	14.2	150618	1069
288	15.10.2006 00:00	277.2	141.4	4.09	10	143112	1065
289	16.10.2006 00:00	281.7	143.7	4.21	9.9	142904	1060
290	17.10.2006 00:00	284.5	145.2	4.33	9.6	143936	1064
291	18.10.2006 00:00	257.5	131.4	5.36	7.9	144580	1064
292	19.10.2006 00:00	39.9	20.4	19	19.9	83634	1061
293	20.10.2006 00:00	0	0	0	0	0	1058
294	21.10.2006 00:00	0	0	0	0	0	1057
295	22.10.2006 00:00	0	0	0	0	0	1057
296	23.10.2006 00:00	0	0	0	0	0	1058
297	24.10.2006 00:00	0	0	0	0	0	1057
298	25.10.2006 00:00	0	0	0	0	0	1058
299	26.10.2006 00:00	0	0	0	0	0	1063
300	27.10.2006 00:00	0	0	0	0	0	1064
301	28.10.2006 00:00	0	0	0	0	0	1062
302	29.10.2006 00:00	0	0	0	0	0	1057
303	30.10.2006 00:00	0	0	0	0	0	1050
304	31.10.2006 00:00	0	0	0	0	0	1058
305	01.11.2006 00:00	0	0	0	0	0	1053
306	02.11.2006 00:00	0	0	0	0	0	1051
307	03.11.2006 00:00	0	0	0	0	0	1052
308	04.11.2006 00:00	0	0	0	0	0	1058
309	05.11.2006 00:00	0	0	0	0	0	1058
310	06.11.2006 00:00	0	0	0	0	0	1056

311	07.11.2006 00:00	0	0	0	0	0	1060
312	08.11.2006 00:00	0	0	0	0	0	1064
313	09.11.2006 00:00	0	0	0	0	0	1060
314	10.11.2006 00:00	0	0	0	0	0	1060
315	11.11.2006 00:00	0	0	0	0	0	1063
316	12.11.2006 00:00	0	0	0	0	0	1055
317	13.11.2006 00:00	0	0	0	0	0	1050
318	14.11.2006 00:00	0	0	0	0	0	1055
319	15.11.2006 00:00	0	0	0	0	0	1061
320	16.11.2006 00:00	0	0	0	0	0	1061
321	17.11.2006 00:00	0	0	0	0	0	1060
322	18.11.2006 00:00	0	0	0	0	0	1063
323	19.11.2006 00:00	0	0	0	0	0	1065
324	20.11.2006 00:00	0	0	0	0	0	1062
325	21.11.2006 00:00	0	0	0	0	0	1057
326	22.11.2006 00:00	0	0	0	0	0	1053
327	23.11.2006 00:00	0	0	0	0	0	1054
328	24.11.2006 00:00	0	0	0	0	0	1060
329	25.11.2006 00:00	0	0	0	0	0	1063
330	26.11.2006 00:00	0	0	0	0	0	1066
331	27.11.2006 00:00	0	0	0	0	0	1066
332	28.11.2006 00:00	0	0	0	0	0	1066
333	29.11.2006 00:00	32.5	16.6	19.96	17.4	85865	1067
334	30.11.2006 00:00	415.2	211.8	2.6	15.5	151930	1073
335	01.12.2006 00:00	401.1	204.6	2.57	15.1	152277	1074
336	02.12.2006 00:00	396.5	202.3	2.63	15.6	152020	1070
337	03.12.2006 00:00	399.3	203.7	2.49	16.2	151208	1064
338	04.12.2006 00:00	393.4	200.7	2.61	16	150785	1059
339	05.12.2006 00:00	403.2	205.7	2.61	17.4	150084	1059
340	06.12.2006 00:00	417	212.8	2.51	17.2	150355	1062
341	07.12.2006 00:00	423.7	216.2	2.43	17.5	150202	1062
342	08.12.2006 00:00	261.2	133.3	9.73	25	123966	1061

343	09.12.2006 00:00	431.5	220.2	2.47	16.7	150722	1064
344	10.12.2006 00:00	433.3	221.1	2.47	16.7	151050	1066
345	11.12.2006 00:00	437.5	223.2	2.51	16.3	151294	1068
346	12.12.2006 00:00	442.1	225.6	2.49	16.6	151151	1065
347	13.12.2006 00:00	444.2	226.6	2.62	15.7	151928	1069
348	14.12.2006 00:00	448.9	229	2.64	15.3	152422	1070
349	15.12.2006 00:00	444.7	226.9	2.59	15.8	152299	1071
350	16.12.2006 00:00	448.2	228.7	2.55	16.7	151615	1069
351	17.12.2006 00:00	445.9	227.5	2.48	16.6	151151	1065
352	18.12.2006 00:00	445.6	227.3	2.59	17	150448	1062
353	19.12.2006 00:00	457.1	233.2	2.43	17	150344	1062
354	20.12.2006 00:00	464	236.7	2.58	15.3	151769	1064
355	21.12.2006 00:00	460.5	234.9	2.59	14.7	152568	1070
356	22.12.2006 00:00	455.6	232.4	2.58	15.3	152564	1073
357	23.12.2006 00:00	465.5	237.5	2.6	15.3	152505	1072
358	24.12.2006 00:00	461.1	235.3	2.54	15.7	151831	1070
359	25.12.2006 00:00	459.8	234.6	2.6	15.8	151174	1062
360	26.12.2006 00:00	466.4	238	2.57	14.8	152484	1067
361	27.12.2006 00:00	475.7	242.7	2.52	14.8	152132	1068
362	28.12.2006 00:00	475.4	242.6	2.34	15.5	151004	1065
363	29.12.2006 00:00	477.9	243.8	2.29	15.8	150650	1063
364	30.12.2006 00:00	493.2	251.6	2.35	15.1	151839	1071
365	31.12.2006 00:00	496.4	253.3	2.38	15.4	151761	1071

Note: The above data is based on average daily values. Specific cases like shut-downs and start-ups are evaluated case by case and where needed recalculations are made.

Annex II

N_2O Emission Reduction for the period 01.01.2006 - 31.12.2006

Nitric Acid Plant

DATE:
2006y.

Period	Production of 100 % HNO3 [ton]	N2O emission [kg]	Emission factor actual [kg/ton]	Emission factor baseline [kg/ton]	Emission reduction N2O [kg]	Emission reduction CO2 [eq. ton]
1	2	3	4	5	6	7
01.01.2006 - 01.01.2006	955.92	1207.95	1.26	5.54	4091.3	1268.3
02.01.2006 - 08.01.2006	6915.38	9005.81	1.3	5.54	29321.2	9089.6
09.01.2006 - 15.01.2006	7035.31	9704.12	1.38	5.54	29266.9	9072.7
16.01.2006 - 22.01.2006	7656.02	11349.46	1.48	5.54	31083.4	9635.9
23.01.2006 - 29.01.2006	7005.34	10343.15	1.48	5.54	28441.7	8816.9
30.01.2006 - 31.01.2006	1942.65	2791.08	1.44	5.54	7964.9	2469.1
01.02.2006 - 05.02.2006	4779.68	6901.86	1.44	5.54	19596.7	6075.0
06.02.2006 - 12.02.2006	6719.72	9850.44	1.47	5.54	27349.3	8478.3
13.02.2006 - 19.02.2006	4498.24	6919.3	1.48	5.54	18262.9	5661.5
20.02.2006 - 26.02.2006	6292.93	10212.5	1.62	5.54	24668.3	7647.2
27.02.2006 - 28.02.2006	1885.02	3044.71	1.62	5.54	7389.3	2290.7
01.03.2006 - 05.03.2006	4773.64	7797.13	1.63	5.54	18664.9	5786.1
06.03.2006 - 12.03.2006	7014.63	11965.54	1.71	5.54	26866.0	8328.5
13.03.2006 - 19.03.2006	7027.38	12436.92	1.77	5.54	26493.2	8212.9
20.03.2006 - 26.03.2006	7576.14	14359.56	1.9	5.54	27577.1	8548.9
27.03.2006 - 31.03.2006	4759.08	8426.61	1.77	5.54	17941.7	5561.9
01.04.2006 - 02.04.2006	1911.27	3444.3	1.8	5.54	7148.1	2215.9

03.04.2006 - 09.04.2006	2396.7	2650.07	1.82	5.54	8915.7	2763.9
10.04.2006 - 16.04.2006	1228.62	1315.13	1.91	5.54	4459.9	1382.6
17.04.2006 - 23.04.2006	6819.55	13518.19	1.98	5.54	24277.6	7526.1
24.04.2006 - 30.04.2006	6319.24	12446.75	1.97	5.54	22559.7	6993.5
01.05.2006 - 07.05.2006	6335.06	12859.63	2.03	5.54	22236.1	6893.2
08.05.2006 - 14.05.2006	6316.02	13082.13	2.07	5.54	21916.6	6794.1
15.05.2006 - 21.05.2006	6293.77	13468.26	2.14	5.54	21398.8	6633.6
22.05.2006 - 28.05.2006	6299.07	13936.8	2.21	5.54	20975.9	6502.5
29.05.2006 - 31.05.2006	2686.85	5845.5	2.18	5.54	9027.8	2798.6
01.06.2006 - 04.06.2006	3325.12	7552.98	2.31	5.54	10740.1	3329.4
05.06.2006 - 11.06.2006	1396.08	1583.55	2.36	5.54	4439.5	1376.3
12.06.2006 - 18.06.2006	0	0	0	5.54	0.0	0.0
19.06.2006 - 25.06.2006	0	0	0	5.54	0.0	0.0
26.06.2006 - 30.06.2006	0	0	0	5.54	0.0	0.0
01.07.2006 - 02.07.2006	0	0	0	5.54	0.0	0.0
03.07.2006 - 09.07.2006	0	0	0	5.54	0.0	0.0
10.07.2006 - 16.07.2006	0	0	0	5.54	0.0	0.0
17.07.2006 - 23.07.2006	0	0	0	5.54	0.0	0.0
24.07.2006 - 30.07.2006	0	0	0	5.54	0.0	0.0
31.07.2006 - 31.07.2006	0	0	0	5.54	0.0	0.0
01.08.2006 - 06.08.2006	0	0	0	5.54	0.0	0.0
07.08.2006 - 13.08.2006	0	0	0	5.54	0.0	0.0
14.08.2006 - 20.08.2006	0	0	0	5.54	0.0	0.0
21.08.2006 - 27.08.2006	0	0	0	5.54	0.0	0.0
28.08.2006 - 31.08.2006	4087.77	2088.21	0.51	5.54	20561.5	6374.1
01.09.2006 - 03.09.2006	3349.97	1454.43	0.43	5.54	17118.3	5306.7

04.09.2006 - 10.09.2006	7334.93	3719.29	0.51	5.54	36894.7	11437.4
11.09.2006 - 17.09.2006	7167.22	4448.18	0.62	5.54	35262.7	10931.4
18.09.2006 - 24.09.2006	7650.45	6013.53	0.79	5.54	36339.6	11265.3
25.09.2006 - 30.09.2006	6158.81	5258.96	0.85	5.54	28884.8	8954.3
01.10.2006 - 01.10.2006	1086.25	1021.11	0.94	5.54	4996.8	1549.0
02.10.2006 - 08.10.2006	4679.3	3910.32	1.01	5.54	21197.2	6571.1
09.10.2006 - 15.10.2006	7552.75	8153.29	1.08	5.54	33685.3	10442.4
16.10.2006 - 22.10.2006	2970	2133.98	0.99	5.54	13513.5	4189.2
23.10.2006 - 29.10.2006	0	0	0	5.54	0.0	0.0
30.10.2006 - 31.10.2006	0	0	0	5.54	0.0	0.0
01.11.2006 - 05.11.2006	0	0	0	5.54	0.0	0.0
06.11.2006 - 12.11.2006	0	0	0	5.54	0.0	0.0
13.11.2006 - 19.11.2006	0	0	0	5.54	0.0	0.0
20.11.2006 - 26.11.2006	0	0	0	5.54	0.0	0.0
27.11.2006 - 30.11.2006	1157.99	1034.63	1.24	5.54	4979.4	1543.6
01.12.2006 - 03.12.2006	3418.65	4361.75	1.28	5.54	14563.4	4514.7
04.12.2006 - 10.12.2006	7480.56	9731.66	1.32	5.54	31568.0	9786.1
11.12.2006 - 17.12.2006	8040.75	11327.73	1.41	5.54	33208.3	10294.6
18.12.2006 - 24.12.2006	8019.84	11686.26	1.46	5.54	32720.9	10143.5
25.12.2006 - 31.12.2006	8037.02	12167.76	1.51	5.54	32389.2	10040.6
TOTAL after recalculation	**226356.7**	**326530.5**	**1.488**	**5.54**	**920958.4**	**285497.1**

Notes:

1. During the period 6.6.2006 (8,15h) -27.8.2006 (6,15h) the pant was in annual planned shut-down.
2. During the periods below the plant was stopped for reasons as described:

- 17.02.2006 (12,55h)- 19.02.2006 (16,00h). Reason: Lack of raw material (ammonia)
- 5.04.2006 (10,45h) – 15.04.2006 (21.00h). Reason: Lack of raw material (ammonia)
- 2.06.2006 (20,30h) – 3.06.2006 (11,00h). Reason: Malfunctioning of the DCS automation system.
- 2.10.2006 (20,25h) – 5.10.2006 (14,15h). Reason: Electrical failure
- 19.10.2006 (4,00h) - 29.11.2006 (22,30h) Reason: the plant for the production of nitric acid has not been in operation, because of a forced emergency shut-down in Ammonia Plant and lack of raw material.
- 8.12.2006 (12,40h) – 8.12.2006 (22,15h). Reason: Break-down of one compressor oil cooling pump.

Calculations and corrections on N2O emissions have been made for the above periods to ensure preciseness of data. Methodology for recalculations have been agreed with verifier.

3. In order to ensure the necessary authenticity of the monitoring data and elimination of the abnormal emission levels detected at a start-up and a shut-down of the Nitric Acid Plant in the monitoring system was integrated a filter, based on the indicative for the operation of the plant index “flow rate of the effluent gasses”. At a limit value of the flow rate < 90 000 Nm^3/h these abnormal emissions are excluded/ filtered (made equal to zero) and the same participate when making the calculations.

Annex III
Description of monitoring equipment

№	Index	Devices	Measurement method	Range	Certificate
1	N_2O	IR analyzer module URAS 14	IR spectroscopy	0…5 000 ppmv.	TÜV, for the system Advance Analyzer Module URAS 14
2	O_2	Electrochemical sensor	Electrochemical	0..10/25 Vol.%	TÜV, for the system Advance Analyzer Module URAS 14
3	Gas volumetric flow	System Durag D-FL 100 with a transformer of differential pressure and measuring unit type: D-FL 100-10 Temperature transmiter, differential and static pressure	Calculated on the bases of the cross section of the gas outlet pipe, velocity, pressure and the temperature by means of microprocessor unit type D-FL 100-10	- - -	The system DURAG D-FL 100 tested for functional suitability by TÜV, according to the protocol №128CU11650 / 29.03.1996
4	Temperature	System Durag D-FL 100 Temperature transmitter Pt 100 type – FL 100 TM-H	Thermo-resistant	0 ÷ 50 ^oC	
5	Flow rate	System Durag D-FL 100 a probe cross-fitted to the gas outlet pipe type - FL 100 DS2	Calculated on the basis of the differential pressure through air-speed tube (Pito tube)	> 3,0 m/s	
6	Gas pressure	System Durag D-FL 100 transmitter for differential pressure FL 100 DDM/H; pressure transmitter type: AMD 210	Physical	900–1200 hPa	