



**Monitoring report form
(Version 04.0)**

MONITORING REPORT

Title of the project activity	Sasol Nitrous Oxide Abatement Project
Reference number of the project activity	961
Version number of the monitoring report	1.0
Completion date of the monitoring report	22/08/2014
Registration date of the project activity	25/05/2007
Monitoring period number and duration of this monitoring period	Monitoring period n.6 From 01 August 2011 to 24 May 2014 1028 Days
Project participant(s)	South Africa: Sasol Nitro; Sasol Financing (Pty) Limited United Kingdom of Great Britain and Northern Ireland: MGM Carbon Portfolio S.a.r.l. Switzerland: MGM Carbon Portfolio S.a.r.l. Germany: Sasol Germany GmbH; Sasol Solvents Germany GmbH
Host Party(ies)	Republic of South Africa
Sectoral scope and selected methodology(ies), and where applicable, applied standardized baseline(s)	Scope 5- AM0034 ver 2.0
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	2,845,298
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	2,224,867
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	1,545,159
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	641,032

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

The project activity takes place at two nitric acid plants owned by Sasol Nitro, Sasolburg and Secunda and involves the installation of a secondary catalyst to abate N₂O inside the ammonia burner once it is formed.

Nitrous oxide (N₂O) is an undesired by-product gas from the manufacture of nitric acid. Nitrous oxide is formed during the catalytic oxidation of ammonia. Over a suitable catalyst, a maximum 98% (typically 92-96%) of the ammonia fed is converted to nitric oxide (NO). The remainder participates in undesirable side reactions that lead to the production of nitrous oxide, among other compounds.

Waste N₂O from nitric acid production is typically released into the atmosphere, as it does not have any economic value or toxicity at typical emission levels. N₂O is an important greenhouse gas which has a high global warming potential (GWP) of 310.

Sasolburg and Secunda plants installed a secondary catalyst beneath the primary one, inside the ammonia burner, which destroys the N₂O transforming it in N₂ and O₂.

In order to monitor the emissions, the plants installed an Automated Monitoring System (AMS) at the stack, consisting of an Infrared Gas Analyzer and a Gas Flow meter.

Relevant dates for the project activity:

Registration date: May 25, 2007

Crediting period: May 25, 2007 to May 24, 2014 (renewable)

Relevant dates for Sasolburg plant:

Campaign	From (dd/mm/yyyy)	To (dd/mm/yyyy)
Baseline campaign	12/06/2006	05/03/2007
1 st project campaign	07/03/2007	01/10/2007
2 nd project campaign	03/10/2007	05/04/2008
3 rd project campaign	21/04/2008	07/12/2008
4 th project campaign	11/12/2008	03/08/2009
5 th project campaign	08/08/2009	02/05/2010
6 th project campaign	07/05/2010	05/12/2010
7 th project campaign	09/12/2010	31/07/2011
8 th project campaign	05/08/2011	03/03/2012
9 th project campaign	23/03/2012	02/12/2012
10 th project campaign	05/12/2012	28/07/2013
11 th project campaign	06/08/2013	30/03/2014

Sasolburg plant considers the operative day from 6:00 AM of the corresponding day to 5:00 AM of the following day. To be consistent with this, the campaigns start at 6AM of the first day and they finish at 5AM of the day after the last day.

Relevant dates for Secunda plant:

Campaign	From (dd/mm/yyyy)	To (dd/mm/yyyy)
Baseline campaign	29/08/2006	23/03/2007
1 st project campaign	18/04/2007	05/01/2008

2 nd project campaign	12/01/2008	09/08/2008
3 rd project campaign	31/08/2008	26/04/2009
4 th project campaign	01/05/2009	31/01/2010
5 th project campaign	05/02/2010	09/09/2010
6 th project campaign	26/09/2010	30/04/2011
7 th project campaign	01/06/2011	05/02/2012
8 th project campaign	10/02/2012	13/08/2012
9 th project campaign	20/08/2012	07/04/2013
10 th project campaign	20/04/2013	05/01/2014
11 th project campaign	16/01/2014	Not finished yet

This monitoring report involves project activity from: August 1, 2011 to May 24, 2014 (both days included). The abovementioned period comprises the following project campaigns for the two plants:

Sasolburg plant:

- Eighth project campaign – from 05/08/2011 to 03/03/2012;
- Ninth project campaign – from 23/03/2012 to 02/12/2012;
- Tenth project campaign – from 05/12/2012 to 28/07/2013;
- Eleventh project campaign – from 06/08/2013 to 30/03/2014.

During the days between campaigns the plant was in shutdown period for gauze change, therefore no CERs were generated during those days.

Secunda plant:

- Seventh project campaign- from 01/06/2011 to 05/02/2012;
- Eighth project campaign – from 10/02/2012 to 13/08/2012;
- Ninth project campaign – from 20/08/2012 to 07/04/2013;
- Tenth project campaign – from 20/04/2013 to 05/01/2014;
- Eleventh project campaign – from 16/01/2014 to the present day (not finished yet).

During the days between campaigns the plant was in shutdown period for gauze change, therefore no CERs were generated during those days.

Total emission reductions achieved in this monitoring period: 2,224,867 tCO₂e

A.2. Location of project activity

The project activity takes place at Sasolburg and Secunda nitric acid plants.

Sasolburg plant is located in cnr Bunsen and Bergius street, Sasolburg 1974, (S 26° 49.542'; E 027° 609'), Free State, Republic of South Africa.

Secunda plant is located in Sasol Nitro, Nitrogen Road, Secunda, 2302 (S 26° 35' 30.80"; E 029° 10' 55.79"), Mpumalanga, Republic of South Africa.

A.3. Parties and project participant(s)

Party involved (host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
United Kingdom	MGM Carbon Portfolio S.a.r.l.	No
Switzerland	MGM Carbon Portfolio S.a.r.l.	No

Party involved (host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Republic of South Africa (host)	Sasol Nitro Sasol Financing (Pty) Limited	No
Germany	Sasol Germany GmbH Sasol Solvents Germany GmbH'	No

A.4. Reference of applied methodology and standardized baseline

The selected methodology is AM0034 "Catalytic reduction of N₂O inside the ammonia burner of nitric acid plants" version 02. (EB 27)

AM0028 "Catalytic reduction of N₂O in the tail gas of Nitric Acid or Caprolactam Productions Plants" is used to select the baseline scenario.

The "Tool for the demonstration and assessment of additionality" version 02 (EB 22) is used to demonstrate additionality.

A.5. Crediting period of project activity

The crediting period started on 25/05/2007. The length of the crediting period is 7 years, renewable.

A.6. Contact information of responsible persons/ entities

Work prepared by:

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External Consultant
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SECTION B. Implementation of project activity

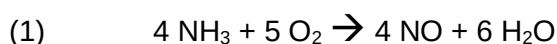
B.1. Description of implemented registered project activity

The Ostwald process

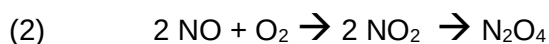
Nowadays, all commercial Nitric Acid is produced by the oxidation of ammonia, and subsequent reaction of the oxidation products with water, through the Ostwald process.

The basic Ostwald process involves 3 chemical steps:

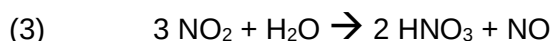
- A) Catalytic oxidation of ammonia with atmospheric oxygen, to yield Nitrogen Monoxide (or Nitric Oxide).



- B) Oxidation of the Nitrogen Monoxide to Nitrogen Dioxide or Dinitrogen Tetroxide



- C) Absorption of the Nitrogen Oxides with water to yield Nitric Acid



Reaction 1 is favored by lower pressure and higher temperature. Nevertheless, at too high temperature, secondary reactions take place that lower yield (affecting nitric production); then, an optimal is found between 850-950 °C, affected by other process conditions and catalyst chemical composition (Figure 1)¹. Reactions 2 and 3 are favored by higher pressure and lower temperatures.

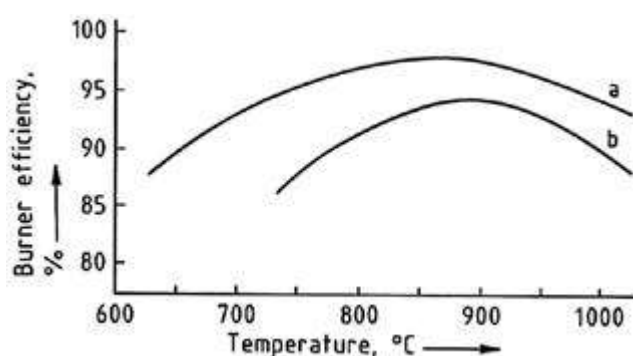


Figure 1. Conversion of Ammonia to Nitrogen Monoxide on Platinum Gauze as a function of temperature a) 100 kPa; (b) 400 kPa [1]

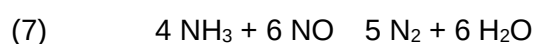
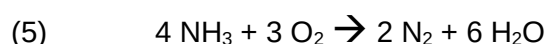
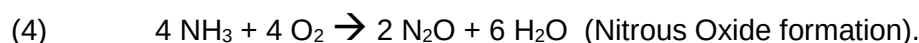
¹ Thieman et al., "Nitric Acid, Nitrous Acid, and Nitrogen Oxides", *Ullmann's Encyclopedia of Industrial Chemistry* 6th Edition, Wiley-VCH Verlag GmbH & Co. KGaA. All rights reserved.

The way in which these three steps are implemented, characterizes the various Nitric Acid processes found throughout the industry. In mono pressure or single pressure processes ammonia combustion and nitrogen oxide absorption take place at the same working pressure. In dual pressure or split pressure plants the absorption pressure is higher than the combustion pressure.

Nitrous Oxide formation

Nitrous oxide is formed during the catalytic oxidation of Ammonia. Over a suitable catalyst, a maximum 98% (typically 92-96%) of the fed Ammonia is converted to Nitric Oxide (NO) according to reaction (1) above. The remainder participates in undesirable side reactions that lead to Nitrous Oxide (N₂O), among other compounds.

Side reactions during oxidation of Ammonia:



N₂O abatement technology classification

The potential technologies (proven and under development) to treat N₂O emissions at Nitric acid plants, have been classified as follows, based on the process location of the control device:

Primary: N₂O is prevented from forming in the oxidation gauzes.

Secondary: N₂O once formed, is eliminated anywhere between the outlet of the ammonia oxidation gauzes and the inlet of the absorption tower.

Tertiary: N₂O is removed at the tail gas, after the absorption tower and previous to the expansion turbine. Quaternary: N₂O is removed following the expansion turbine, and before the stack.

Selected technology for the project activity

General description

The current project activity involves the installation of a new (not previously installed) catalyst below the oxidation gauzes (a “secondary catalyst”) whose sole purpose is the decomposition of N₂O; the secondary approach has the following advantages:

- The catalyst does not consume electricity, steam, fuels or reducing agents (all sources of leakage) to eliminate N₂O emissions; thus, operating costs are negligible and the overall energy balance of the plant is not affected.
- Installation is extremely simple and does not require any new process unit or re-design of existing ones (only in a few cases, the reactor basket needs some minor modifications to accommodate the new catalyst).
- Installation is also very fast, so it is done simultaneously with a primary gauze changeover; thus, the plant has no loss in production due to incremental down time.
- Considerably lower capital cost when compared to other approaches.

Sasol’s plants installed a secondary catalyst hereinafter called “Heraeus”.

After extensive research, Heraeus has developed a “secondary” catalyst that decomposes N₂O without affecting Nitric Acid production. The active element of the catalyst is a proprietary coat of precious metals (the same elements already present in the oxidation gauzes) deposited over ceramic pieces made of alfa-alumina (a common reactor material used, for e.g., in Raschig rings) of several shapes and sizes.

The catalyst has a very high activity for N₂O decomposition; in a typical medium pressure plant, a catalyst weight of 30 kg/m² of cross sectional surface is sufficient to reduce N₂O concentration well below 100 ppmv. Theoretically, any given level of N₂O abatement can be reached, but in practice the abatement will be limited by practical and economical considerations. Heraeus secondary catalyst is not designed as catchment for precious metals, so it does not adsorb any material lost from the primary gauzes.

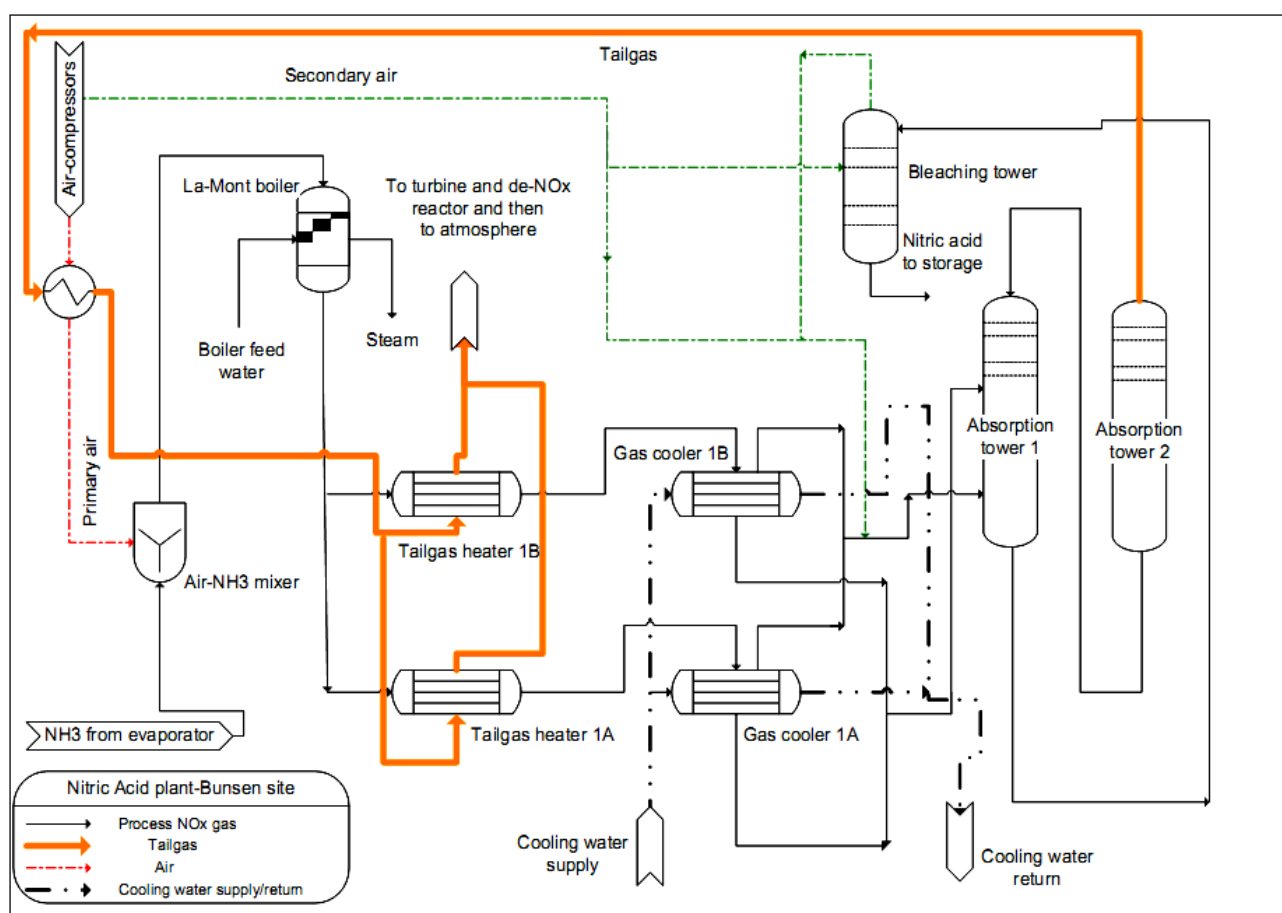


Figure 2. Sasolburg process flow diagram

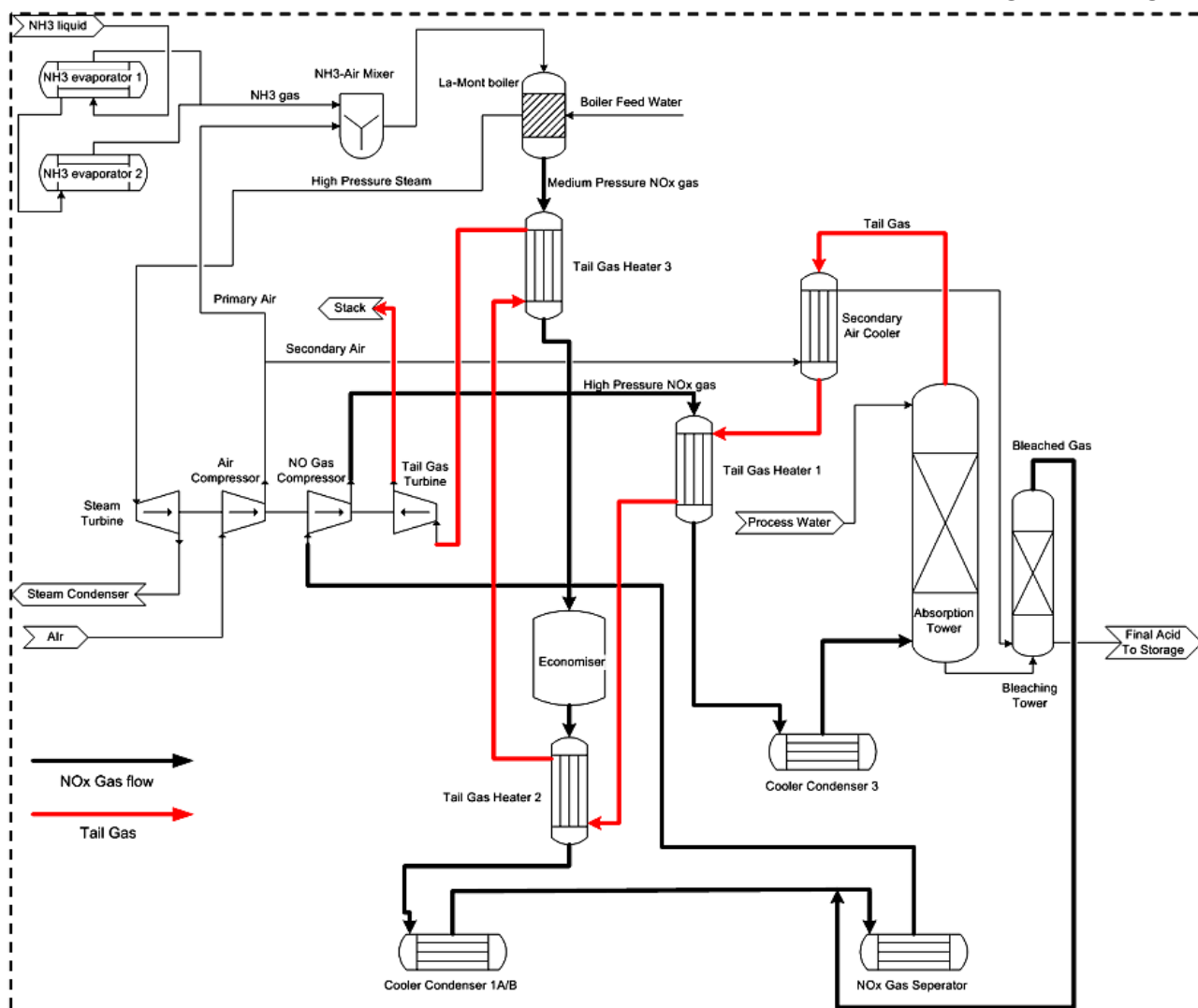


Figure 3. Secunda process flow diagram.

The project is fully implemented at both plants according to the description presented in the PDD.

All physical features of the proposed CDM project activity including data collecting systems and storage have been implemented in accordance with the registered PDD. The project activity is completely operational.

Nitric acid production has been undertaken since 1973 at Sasolburg plant and since 1984 at Secunda plant.

The first campaigns with the secondary catalyst installed started on:

- March 7, 2007 at Sasolburg plant
- April 18, 2007 at Secunda plant.

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

N.A.

B.2.2. Corrections

N.A.

B.2.3. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

N.A.

B.2.4. Changes to project design of registered project activity

N.A.

B.2.5. Changes to start date of crediting period

N.A.

B.2.6. Types of changes specific to afforestation or reforestation project activity

N.A.

SECTION C. Description of monitoring system

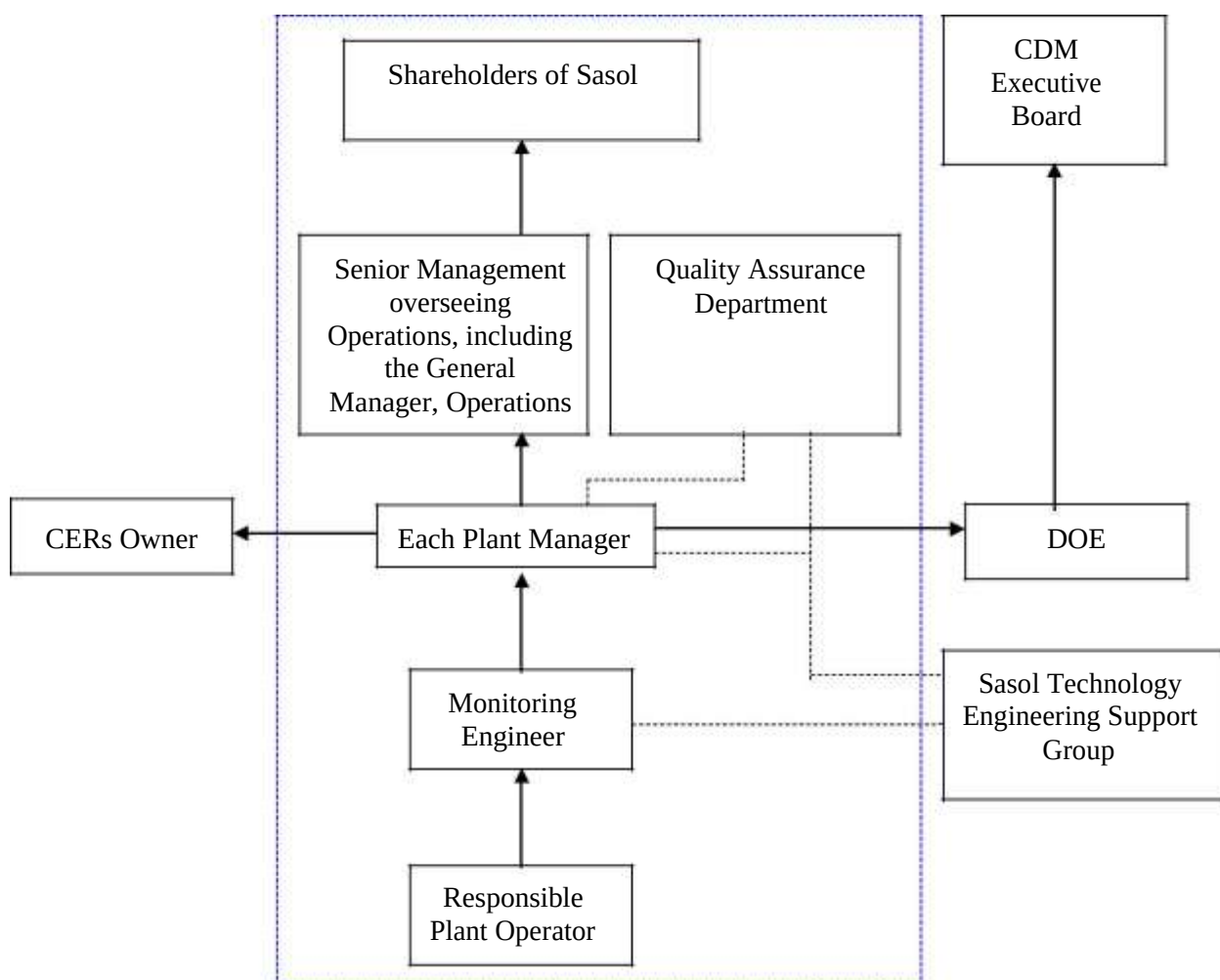
The current CDM project “Sasol Nitrous Oxide Abatement Project” measures on a quasi-continuous basis (uninterrupted sampling of flue gases with concentration and normalized flow analysis on short, discrete time periods) the N₂O mass flow leaving the Nitric acid plant through an Automated Measuring System (AMS) using technologies and procedures in accordance with AM0034: “Catalytic reduction of N₂O inside the Ammonia burner of nitric acid plants”.

Both Sasolburg and Secunda plants are currently ISO 9001/2000 and ISO 14001/2004 certified. The monitoring procedures (deployed as per the current monitoring plan and being an integral part of it), are fully integrated into Sasol’s Quality and

As a producer of fertilizers, explosives and related products, Sasol Nitro management and staff are committed to comply with the requirements of the ISO 9001:2000 Quality Management System and to continually improve the effectiveness of the system.

The proposed CDM project is closely monitored, metered and recorded. The management and operation of the nitrous oxide abatement project at the two Sasol plants are the responsibility of each plant. The emission reductions are verified by an independent entity, the Designated Operational Entity (DOE). A regular reporting of the emission reductions generated by the project is emitted to the CERs owner, coincidentally with the DOE verification.

An illustrative scheme of the operational and management structure that monitor the proposed CDM project activity is as follows:



The relation between the project operational and management structure, and other actors of the proposed CDM project activity, is described as follows:

- At each plant, the responsible Plant Operator is in charge of the supervision of automated measuring system (AMS) and the data acquisition system (DAS) that are installed to measure and acquire both emission and process data. Supported by the DAS, the Plant Operator reports the relevant data to the Monitoring Engineer.
- The Monitoring Engineer is a member of the plant staff structure that is also in charge of processing the data generated by the data acquisition system. The Monitoring Engineer receives the relevant plant data from the responsible Plant Operator. These data are entered into a spreadsheet especially designed for the monitoring plan. The Project Developer supports the Monitoring Engineer at analyzing data and assures appropriate and consistent procedural application during report preparation.
- The Plant Manager of the respective plant is responsible to ensure that the CDM project activity at plant level is implemented in compliance with the PDD and other relevant standards. The Plant Manager routinely reports to the General Manager Operations as to the overall progress of the CDM project activity. At any time that the Plant Manager wants or needs to follow the implementation of the CDM project activity, he/she asks for a report from the Monitoring Engineer. For every single period, the Plant Manager sends a report which basically is the monitoring plan spreadsheet to the CERs owner, as well as to the corresponding DOE.
- Sasol Technology Engineering Support Group can at any time be used as a support function to the Monitoring Engineer in case of personnel loss or changes. The relevant Plant Manager and QA Department also have Sasol Technology available as a resource for assistance when required.
- The DOE then send the corresponding verification report to the CDM Executive Board in order to evaluate it and enable the issuance of the CERs.
- Shareholders of Sasol Nitro also receive a copy of the report sent to the DOE annually from the plant manager.

Description of the AMS

Both Sasolburg and Secunda plants have installed continuous gas analyzers model AO2000 from the supplier ABB, while the specific module to measure N₂O is a non-dispersive infrared instrument called URAS 14.

For stack flow measurement, Sasolburg plant has installed an ultrasound principle unit model Flowsick 100 manufactured by Sick, and Secunda plant has installed an Annubar principle (multiple pressure differential) unit, model 3095 manufactured by Rosemount Inc. (USA).

Good monitoring practice and performance characteristics

The European Norm EN 14181:2004 is recommended as guidance regarding the selection, installation and operation of the AMS under Monitoring Methodology AM0034, and stipulates three quality assurance levels (QALs):

QAL1: Suitability of the AMS for the specific measuring task

The EN 14181: 2004 QAL1 reports were provided by the equipment manufacturers considering the performance characteristics as measured by a qualified technical inspection authority and the specific installation characteristics and site conditions at each plant. The QAL1 reports confirmed that the N₂O analyzers (in both cases an AO 2000- URAS 14 NDIR supplied by ABB GmbH) are

suitable for performing the indicated analysis (N₂O concentration). Reports were audited during validation and are available at the sites for future audits.

QAL2: Validation of the AMS following its installation

QAL2 describes a procedure for the determination of the calibration function and its variability, by means of a certain number of parallel measurements, performed with a standard reference method. The testing laboratory performing the measurements with the standard reference method shall have an accredited quality assurance system according to EN ISO/IEC 17025 or relevant (national) standards.

QAL2 tests were performed in 2007 and 2010 at both plants by SGS Environmental Services (ISO 17025 certified lab). The QAL2 reports are available for DOE review. The reports conclude that the monitoring systems at both plants comply with QAL1 and QAL2 demands of EN 14181.

In order to keep records of AMS data before and after QAL2 test as generated (unmanipulated data), the corrective formulae (calibration functions) were applied during data processing (with the aid of spreadsheets), meaning that calibration functions were not programmed on the distributed control system (DCS) of the plants (which function as data acquisition systems).

QAL3: Ongoing quality assurance during operation

QAL3 of EN 141181: 2004 checks for drift and precision, in order to demonstrate that the AMS is in control during its operations so that it continues to function within the required specification for uncertainty. This is achieved by conducting periodic zero and span checks on the AMS, and evaluating results obtained using control charts. Results of periodic calibrations were analyzed graphically with the aid of Shewart charts. All monitoring equipment has been serviced and maintained according to the manufacturer's instructions and international maintenance records are well kept at both Sasol plants and available for auditing purposes.

AST: annual surveillance test (AST)

The AST is a procedure to evaluate whether the measured values obtained from the AMS still meet the required uncertainty criteria, as evaluated during the QAL2 test. Just as with the QAL2, it also requires a limited number of parallel measurements using an appropriate standard reference method.

An AST was performed by SGS Environmental Services (ISO 17025 certified lab) at both plants in 2008, 2009 and 2011 (The AST is not performed in the year in which QAL2 is performed; therefore it was not performed in 2010). The AST reports are available for DOE review. The reports conclude that the instruments used in the monitoring systems comply with the standards.

Relevant monitoring points:

The following diagrams show the location of all relevant monitoring points.

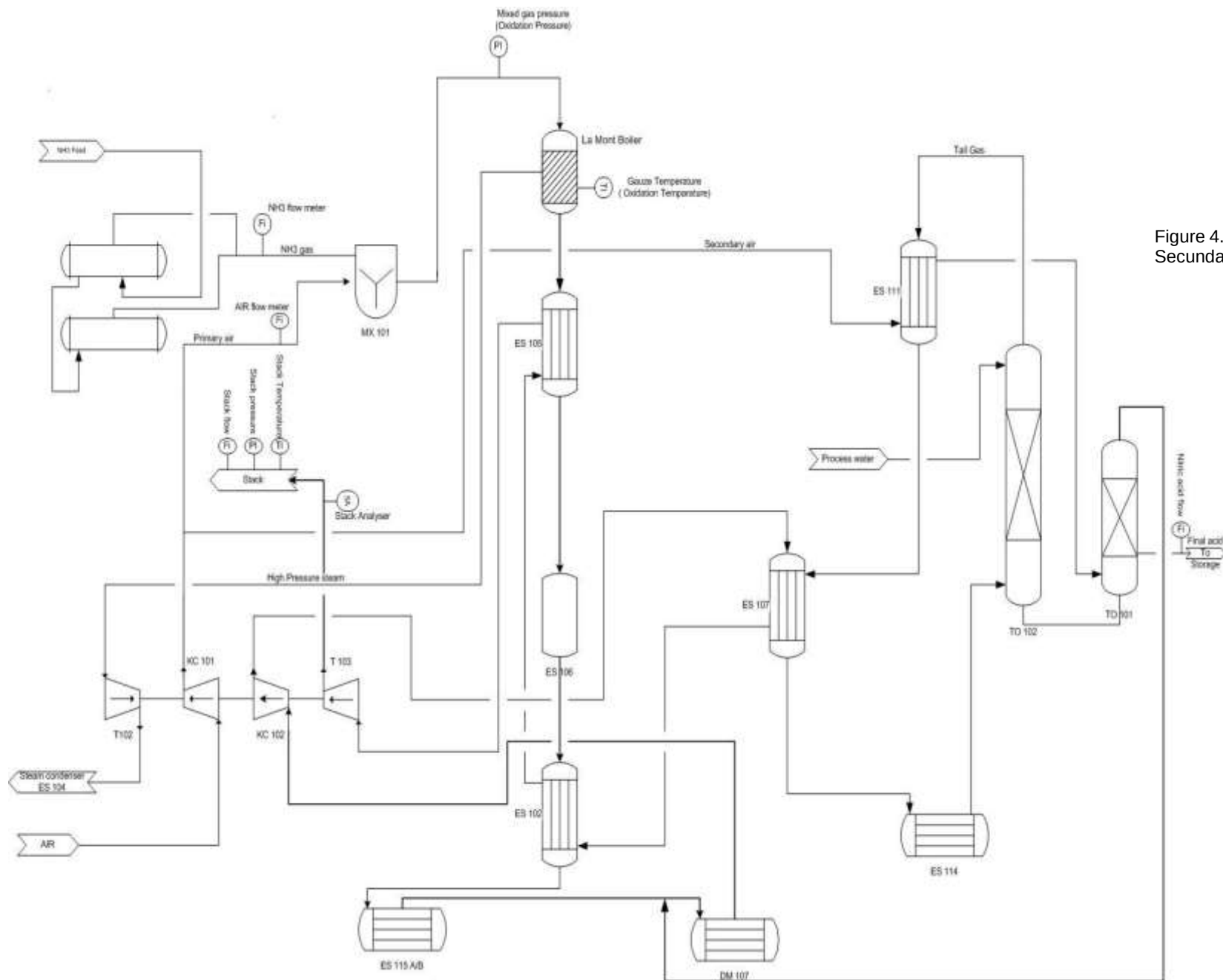


Figure 4. Location of monitoring points at Secunda plant

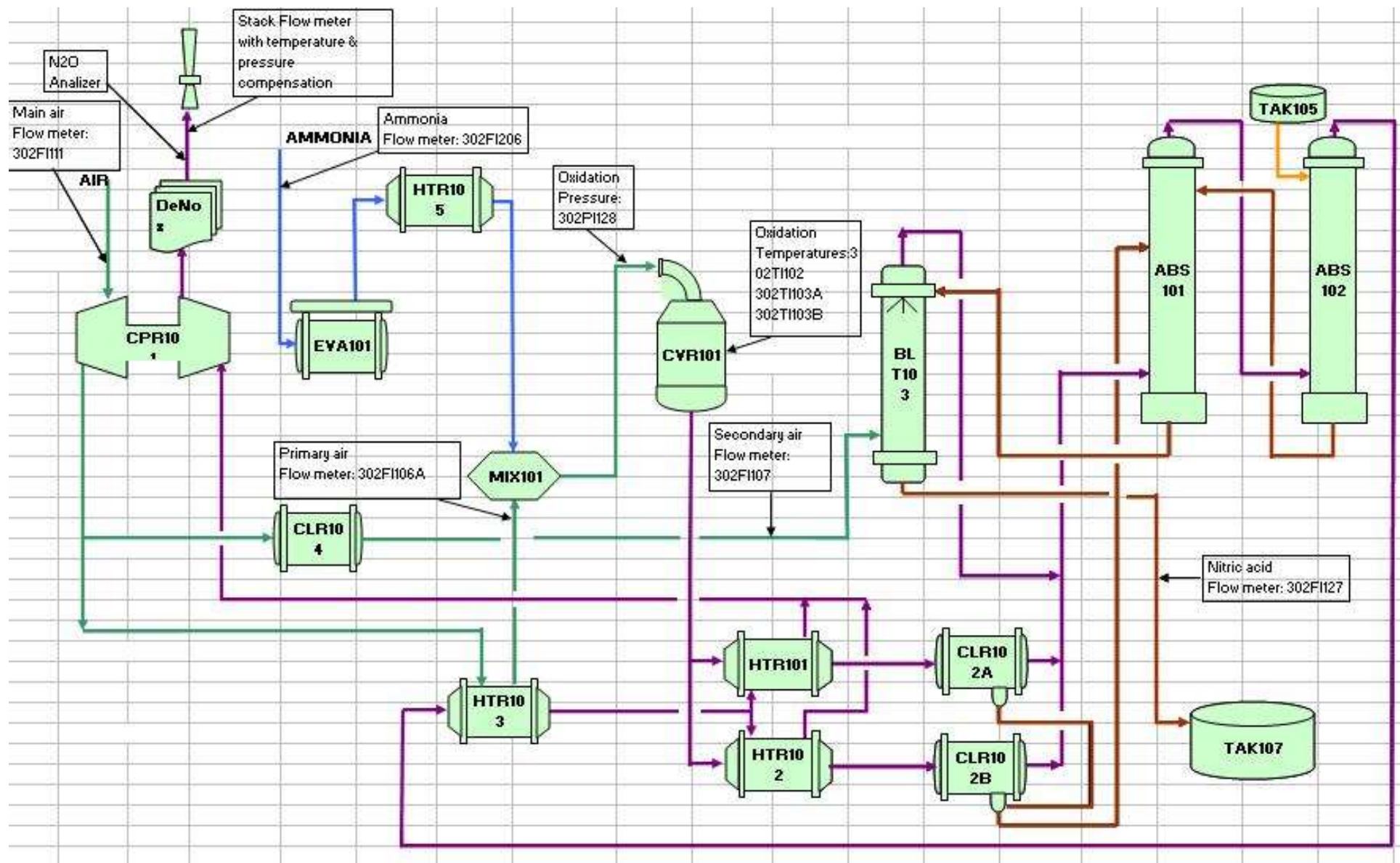


Figure 5: Location of monitoring points at Sasolburg plant

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data / Parameter:	B. 11 AFR_{max}
Unit:	kg NH ₃ /hour
Description:	Maximum Ammonia Flow Rate
Source of data:	Specified by the ammonia oxidation catalyst manufacturer at both plants.
Value(s) applied:	For Sasolburg: 6,771 / For Secunda: 10,630
Purpose of data:	Calculation of baseline emissions
Additional comment:	N.A.

Data / Parameter:	B. 14 CL_{normal}
Unit:	tonne 100% HNO ₃
Description:	The normal campaign length is defined as the average campaign length for the historic campaigns used to define operating conditions (the first 5 campaigns).
Source of data:	Calculated from historical process data
Value(s) applied:	Sasolburg: 114,727 / Secunda: 183,602
Purpose of data:	Calculation of baseline emissions
Additional comment:	N.A.

Data / Parameter:	B. 15 AIFR_{max}
Unit:	kg NH ₃ /kg air
Description:	Maximum Ammonia to Air Flow Rate
Source of data:	Specified by the ammonia oxidation catalyst manufacturer at both plants
Value(s) applied:	For Sasolburg: 0.084 / For Secunda: 0.063
Purpose of data:	Calculation of baseline emissions
Additional comment:	N.A.

Data / Parameter:	B. 17 OT_{normal}
Unit:	°C
Description:	Normal Operating Temperature
Source of data:	Calculated from historical process data (Sasolburg) and from plant design data (Secunda).
Value(s) applied:	For Sasolburg: 703-884 / For Secunda: 860-920
Purpose of data:	Calculation of baseline emissions
Additional comment:	Temperature range

Data / Parameter:	B. 19 OP_{normal}
Unit:	Pa (abs)
Description:	Normal Operating Pressure
Source of data:	Calculated from Plant design data for both plants.
Value(s) applied:	For Sasolburg: 370,000 –450,000 For Secunda: 250,000 –500,000
Purpose of data:	Calculation of baseline emissions
Additional comment:	Pressure range

Data / Parameter:	B. 20 GS_{normal}
Unit:	N.A.

Description:	Gauze supplier during operating condition campaigns (the first five campaigns).
Source of data:	Historical process data
Value(s) applied:	W.C. Heraeus
Purpose of data:	Calculation of baseline and project emissions
Additional comment:	N.A.

Data / Parameter:	B. 23 GC_{normal}
Unit:	%
Description:	Gauze composition for the operation condition campaigns (the first five campaigns).
Source of data:	Historical process data
Value(s) applied:	For Secunda: Pt 54.0 to 55.0 %, Rh 3.5 to 3.8 %, Pd 41.0 to 43.0 % For Sasolburg: Pt 54.0 to 56.0 %, Rh 3.6 to 3.9 %, Pd 40.0 to 42.0%.
Purpose of data:	Calculation of baseline and project emissions
Additional comment:	N.A.

D.2. Data and parameters monitored

Data / Parameter:	P. 1 NCSG																													
Unit:	mg N ₂ O/Nm ³ (converted from ppm if necessary)																													
Description:	N ₂ O concentration in the stack gas for the project campaign																													
Measured/ Calculated / Default:	Measured																													
Source of data:	AMS (infrared gas analyzer) at Sasolburg and Secunda plants.																													
Value(s) of monitored parameter:	<table><tr><td colspan="2">Sasolburg Campaigns</td><td colspan="2">Secunda Campaigns</td></tr><tr><td>8th</td><td>287</td><td>7th</td><td>416</td></tr><tr><td>9th</td><td>509</td><td>8th</td><td>326</td></tr><tr><td>10th</td><td>336</td><td>9th</td><td>414</td></tr><tr><td>11th</td><td>330</td><td>10th</td><td>1,133</td></tr><tr><td>12th</td><td>167</td><td>11th</td><td>546</td></tr></table>					Sasolburg Campaigns		Secunda Campaigns		8th	287	7th	416	9th	509	8th	326	10th	336	9th	414	11th	330	10th	1,133	12th	167	11th	546	
Sasolburg Campaigns		Secunda Campaigns																												
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10th	336	9th	414																											
11th	330	10th	1,133																											
12th	167	11th	546																											
Monitoring equipment:	<table><tr><td>Plant</td><td colspan="2">Sasolburg</td><td colspan="2">Secunda</td></tr><tr><td>type</td><td colspan="2">Infrared Gas Analyser</td><td colspan="2">Infrared Gas Analyser</td></tr><tr><td>accuracy</td><td colspan="2">2%</td><td colspan="2">2%</td></tr><tr><td>serial number</td><td colspan="2">24511-0-204180206004</td><td colspan="2">24031-0-331004300000</td></tr><tr><td>calibration frequency</td><td colspan="2">QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)</td><td colspan="2">QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)</td></tr></table>					Plant	Sasolburg		Secunda		type	Infrared Gas Analyser		Infrared Gas Analyser		accuracy	2%		2%		serial number	24511-0-204180206004		24031-0-331004300000		calibration frequency	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)		QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)	
Plant	Sasolburg		Secunda																											
type	Infrared Gas Analyser		Infrared Gas Analyser																											
accuracy	2%		2%																											
serial number	24511-0-204180206004		24031-0-331004300000																											
calibration frequency	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)		QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)																											
Measuring/ Reading/ Recording frequency:	Every two seconds																													
Calculation method (if applicable):	N.A.																													
QA/QC procedures:	According to standard EN 14181. AST is done on an annual basis and QAL3 is done on a weekly basis.																													
Purpose of data:	Calculation of project emissions.																													

Additional comment:	N.A.
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Data / Parameter:	P.2 VSG																						
Unit:	Nm ³ /hour																						
Description:	Volume flow rate in the stack gas for the project campaign																						
Measured/ Calculated / Default:	Measured																						
Source of data:	AMS (flow meter) at Sasolburg and Secunda plants																						
Value(s) of monitored parameter:	<table> <tr> <th>Sasolburg Campaigns</th><th>Secunda Campaigns</th></tr> <tr> <td>8th</td><td>65,438</td></tr> <tr> <td>9th</td><td>75,529</td></tr> <tr> <td>10th</td><td>72,128</td></tr> <tr> <td>11th</td><td>59,965</td></tr> <tr> <td>12th</td><td>75,185</td></tr> <tr> <td>7th</td><td>79,807</td></tr> <tr> <td>8th</td><td>85,738</td></tr> <tr> <td>9th</td><td>70,997</td></tr> <tr> <td>10th</td><td>80,080</td></tr> <tr> <td>11th</td><td>91,688</td></tr> </table>	Sasolburg Campaigns	Secunda Campaigns	8th	65,438	9th	75,529	10th	72,128	11th	59,965	12th	75,185	7th	79,807	8th	85,738	9th	70,997	10th	80,080	11th	91,688
Sasolburg Campaigns	Secunda Campaigns																						
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Plant	Sasolburg	Secunda																					
Type	Ultrasound principle device	ANNUBAR device (multiple pressure differential principle)																					
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Measuring/ Reading/ Recording frequency:	Every two seconds																						
Calculation method (if applicable):	N.A.																						
QA/QC procedures:	According to standard EN 14181. AST is done on an annual basis.																						
Purpose of data:	Calculation of project emissions.																						
Additional comment:	N.A.																						

Data / Parameter:	P.3 N₂O emission of nth project campaign, PE_n																						
Unit:	tonne N ₂ O																						
Description:	N ₂ O emission for project campaign																						
Measured/ Calculated / Default:	Calculated																						
Source of data:	Calculated from monitored data																						
Value(s) of monitored parameter:	<table> <tr> <th>Sasolburg Campaigns</th><th>Secunda Campaigns</th></tr> <tr> <td>8th</td><td>92.80</td></tr> <tr> <td>9th</td><td>227.92</td></tr> <tr> <td>10th</td><td>133.27</td></tr> <tr> <td>11th</td><td>81.36</td></tr> <tr> <td>12th</td><td>9.96</td></tr> <tr> <td>7th</td><td>132.60</td></tr> <tr> <td>8th</td><td>114.82</td></tr> <tr> <td>9th</td><td>128.62</td></tr> <tr> <td>10th</td><td>92.03</td></tr> <tr> <td>11th</td><td>0.00</td></tr> </table>	Sasolburg Campaigns	Secunda Campaigns	8th	92.80	9th	227.92	10th	133.27	11th	81.36	12th	9.96	7th	132.60	8th	114.82	9th	128.62	10th	92.03	11th	0.00
Sasolburg Campaigns	Secunda Campaigns																						
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8th	114.82																						
9th	128.62																						
10th	92.03																						
11th	0.00																						

Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	Once
Calculation method (if applicable):	N.A.
QA/QC procedures:	N.A.
Purpose of data:	Calculation of project emissions.
Additional comment:	N.A.

Data / Parameter:	P. 4 OH			
Unit:	Hour			
Description:	Total operating hours for the project campaign			
Measured/ Calculated / Default:	Measured			
Source of data:	Process control system of Sasolburg and Secunda plants			
Value(s) of monitored parameter:	Sasolburg Campaigns		Secunda Campaigns	
	8th	4,945	7th	3,990
	9th	5,931	8th	4,107
	10th	5,501	9th	4,371
	11th	4,111	10th	1,014
	12th	793	11th	0
Monitoring equipment:	N.A.			
Measuring/ Reading/ Recording frequency:	Daily			
Calculation method (if applicable):	The AMS records both ammonia and air flow signals (coming from the devices installed to measure flow of both parameters). If both parameters have reached their normal operational levels, the plant status of the plant is treated as ON. This approach is applied for both plants.			
QA/QC procedures:	Critical instruments are calibrated on a routine basis according to the quality assurance system of the plant (ISO 9001).			
Purpose of data:	Calculation of project emissions.			
Additional comment:	N.A.			

Data / Parameter:	P. 5 NAP			
Unit:	tonne 100% HNO ₃			
Description:	Total nitric acid production for the project campaign			
Measured/ Calculated / Default:	Measured			
Source of data:	Production logs of Sasolburg and Secunda plants			
Value(s) of monitored parameter:	Sasolburg Campaigns		Secunda Campaigns	
	8th	108,682	7th	234,602
	9th	130,873	8th	249,631
	10th	106,083	9th	247,628
	11th	82,117	10th	59,881
	12th	14,877	11th	0

Monitoring equipment:	Plant	Sasolburg	Secunda
	type	Coriolis type mass flow measurement	Coriolis type mass flow measurement
	accuracy	0.1%	0.02%
	serial number	3747530 (Transmitter) 12034695 (Sensor)	C200BD20000
	calibration frequency	2 yearly	3 Yearly
Measuring/ Reading/ Recording frequency:	Daily		
Calculation method (if applicable):	Daily production is measured by using a very accurate mass flow meter (Coriolis principle), and correcting by the average of several (3 to 5) concentration checkups performed in analytical lab.		
QA/QC procedures:	Mass balance at the end-product storage tanks is performed on a monthly basis; cross checking of production from mass balance with direct flow measurement is performed routinely. Critical instruments are calibrated on a routine basis according to the quality assurance system of the plant (ISO 9001).		
Purpose of data:	Calculation of project emissions.		
Additional comment:	N.A.		

Data / Parameter:	P. 6 TSG																											
Unit:	°C																											
Description:	Temperature of the stack gas during the project campaign																											
Measured/ Calculated / Default:	Measured																											
Source of data:	AMS (Flow meter) at Sasolburg and Secunda plants.																											
Value(s) of monitored parameter:	<table border="1"> <thead> <tr> <th colspan="2">Sasolburg Campaigns</th> <th colspan="2">Secunda Campaigns</th> </tr> </thead> <tbody> <tr> <td>8th</td> <td>200.3</td> <td>7th</td> <td>93</td> </tr> <tr> <td>9th</td> <td>206.2</td> <td>8th</td> <td>99</td> </tr> <tr> <td>10th</td> <td>193.2</td> <td>9th</td> <td>88</td> </tr> <tr> <td>11th</td> <td>166.5</td> <td>10th</td> <td>106</td> </tr> <tr> <td>12th</td> <td>183.4</td> <td>11th</td> <td>114</td> </tr> </tbody> </table>				Sasolburg Campaigns		Secunda Campaigns		8th	200.3	7th	93	9th	206.2	8th	99	10th	193.2	9th	88	11th	166.5	10th	106	12th	183.4	11th	114
Sasolburg Campaigns		Secunda Campaigns																										
8th	200.3	7th	93																									
9th	206.2	8th	99																									
10th	193.2	9th	88																									
11th	166.5	10th	106																									
12th	183.4	11th	114																									
Monitoring equipment:	Plant	Sasolburg	Secunda																									
	type	I Temp PCP TMT 181	RTD																									
	accuracy	0.08%	0.10%																									
	serial number	6C039D 04111	0135A																									
	calibration frequency	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)																									
Measuring/ Reading/ Recording frequency:	Every two seconds																											
Calculation method (if applicable):	N.A.																											
QA/QC procedures:	According to standard EN 14181. AST is done on an annual basis.																											
Purpose of data:	Calculation of project emissions.																											

Additional comment:	N.A.
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Data / Parameter:	P. 7 PSG																						
Unit:	Pa																						
Description:	Pressure of the stack gas during the project campaign																						
Measured/ Calculated / Default:	Measured																						
Source of data:	AMS (flow meter) at Sasolburg and Secunda plants																						
Value(s) of monitored parameter:	<table> <tr> <th>Sasolburg Campaigns</th><th>Secunda Campaigns</th></tr> <tr> <td>8th</td><td>82,824</td></tr> <tr> <td>7th</td><td>444,554</td></tr> <tr> <td>9th</td><td>85,983</td></tr> <tr> <td>8th</td><td>491,783</td></tr> <tr> <td>10th</td><td>85,937</td></tr> <tr> <td>9th</td><td>398,936</td></tr> <tr> <td>11th</td><td>85,529</td></tr> <tr> <td>10th</td><td>345,731</td></tr> <tr> <td>12th</td><td>86,013</td></tr> <tr> <td>11th</td><td>173,796</td></tr> </table>	Sasolburg Campaigns	Secunda Campaigns	8th	82,824	7th	444,554	9th	85,983	8th	491,783	10th	85,937	9th	398,936	11th	85,529	10th	345,731	12th	86,013	11th	173,796
Sasolburg Campaigns	Secunda Campaigns																						
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Monitoring equipment:	<table> <tr> <th>Plant</th><th>Sasolburg</th><th>Secunda</th></tr> <tr> <td>type</td><td>Rosemount type 3051</td><td>Pressure Transmitter</td></tr> <tr> <td>accuracy</td><td>2%</td><td>0.10%</td></tr> <tr> <td>serial number</td><td>1494518</td><td>0135A</td></tr> <tr> <td>calibration frequency</td><td>QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)</td><td>QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)</td></tr> </table>	Plant	Sasolburg	Secunda	type	Rosemount type 3051	Pressure Transmitter	accuracy	2%	0.10%	serial number	1494518	0135A	calibration frequency	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)							
Plant	Sasolburg	Secunda																					
type	Rosemount type 3051	Pressure Transmitter																					
accuracy	2%	0.10%																					
serial number	1494518	0135A																					
calibration frequency	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)																					
Measuring/ Reading/ Recording frequency:	Every two seconds																						
Calculation method (if applicable):	N.A.																						
QA/QC procedures:	According to standard EN 14181. AST is done on an annual basis.																						
Purpose of data:	Calculation of project emissions.																						
Additional comment:	N.A.																						

Data / Parameter:	P. 8 EF_n																						
Unit:	tonne N ₂ O / tonne 100% HNO ₃																						
Description:	Project emission factor calculated from monitored data for the project campaign																						
Measured/ Calculated / Default:	Calculated																						
Source of data:	Calculated from monitored data.																						
Value(s) of monitored parameter:	<table> <tr> <th>Sasolburg Campaigns</th><th>Secunda Campaigns</th></tr> <tr> <td>8th</td><td>0.00085</td></tr> <tr> <td>7th</td><td>0.00057</td></tr> <tr> <td>9th</td><td>0.00174</td></tr> <tr> <td>8th</td><td>0.00046</td></tr> <tr> <td>10th</td><td>0.00126</td></tr> <tr> <td>9th</td><td>0.00052</td></tr> <tr> <td>11th</td><td>0.00099</td></tr> <tr> <td>10th</td><td>0.00154</td></tr> <tr> <td>12th</td><td>0.00067</td></tr> <tr> <td>11th</td><td>0.00000</td></tr> </table>	Sasolburg Campaigns	Secunda Campaigns	8th	0.00085	7th	0.00057	9th	0.00174	8th	0.00046	10th	0.00126	9th	0.00052	11th	0.00099	10th	0.00154	12th	0.00067	11th	0.00000
Sasolburg Campaigns	Secunda Campaigns																						
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7th	0.00057																						
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9th	0.00052																						
11th	0.00099																						
10th	0.00154																						
12th	0.00067																						
11th	0.00000																						

Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	Once
Calculation method (if applicable):	Calculated using equation number 4 of AM0034 ver 02.
QA/QC procedures:	N.A.
Purpose of data:	Calculation of project emissions.
Additional comment:	N.A.

Data / Parameter:	P. 9 EF _{ma,n}				
Unit:	tonne N ₂ O/tonne 100% HNO ₃				
Description:	Moving average emission factor				
Measured/ Calculated / Default:	Calculated				
Source of data:	Calculated from campaign emission factors.				
Value(s) of monitored parameter:	Sasolburg Campaigns		Secunda Campaigns		
	8th	0.00088	7th	0.00076	
	9th	0.00098	8th	0.00072	
	10th	0.00101	9th	0.00070	
	11th	0.00100	10th	0.00078	
	12th	0.00098	11th	0.00071	
Monitoring equipment:	N.A.				
Measuring/ Reading/ Recording frequency:	Calculated at the end of each project campaign				
Calculation method (if applicable):	Calculated using equation number 5 of AM0034 ver 02.				
QA/QC procedures:	N.A.				
Purpose of data:	Calculation of project emissions.				
Additional comment:	N.A.				

Data / Parameter:	P. 12 CL_n			
Unit:	tonne 100% HNO ₃			
Description:	The project campaign length for the nth campaign (CL _n) is defined as the nitric acid produced during the nth campaign (see project nitric acid production).			
Measured/ Calculated / Default:	Calculated			
Source of data:	Sasolburg and Secunda production log books.			
Value(s) of monitored parameter:	Sasolburg: 442,632 / Secunda: 791,743			
Monitoring equipment:	N.A.			
Measuring/ Reading/ Recording frequency:	Calculated once at the end of the project campaign			
Calculation method (if applicable):	Daily production is measured by using a volume flow meter (Coriolis principle), and correcting by the average of several (3 to 5) concentration checkups performed in analytical lab			

QA/QC procedures:	Mass balance at the end-product storage tanks is performed on a monthly basis; cross checking of production measured by mass balance vs direct flow measurement is performed routinely on both plants. Critical instruments are calibrated on a routinely basis according to the quality assurance system of the plant (ISO 9001).
Purpose of data:	Calculation of project emissions.
Additional comment:	N.A.

Data / Parameter:	P. 13 EF _p																											
Unit:	tonne N ₂ O/tonne 100% HNO ₃																											
Description:	Emission factor used to calculate the emission from the particular campaign.																											
Measured/ Calculated / Default:	Calculated																											
Source of data:	Calculated using campaign emission factors.																											
Value(s) of monitored parameter:	<table><tr><td colspan="2">Sasolburg Campaigns</td><td colspan="2">Secunda Campaigns</td></tr><tr><td>8th</td><td>0.00088</td><td>7th</td><td>0.00088</td></tr><tr><td>9th</td><td>0.00174</td><td>8th</td><td>0.00174</td></tr><tr><td>10th</td><td>0.00126</td><td>9th</td><td>0.00126</td></tr><tr><td>11th</td><td>0.00100</td><td>10th</td><td>0.00100</td></tr><tr><td>12th</td><td>0.00098</td><td>11th</td><td>0.00098</td></tr></table>				Sasolburg Campaigns		Secunda Campaigns		8th	0.00088	7th	0.00088	9th	0.00174	8th	0.00174	10th	0.00126	9th	0.00126	11th	0.00100	10th	0.00100	12th	0.00098	11th	0.00098
Sasolburg Campaigns		Secunda Campaigns																										
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11th	0.00100	10th	0.00100																									
12th	0.00098	11th	0.00098																									
Monitoring equipment:	N.A.																											
Measuring/ Reading/ Recording frequency:	Calculated at the end of each project campaign																											
Calculation method (if applicable):	Calculated using campaign emission factors. EF _p will be determined as the higher of EF _{ma,n} and EF _n .																											
QA/QC procedures:	N.A.																											
Purpose of data:	Calculation of project emissions.																											
Additional comment:	N.A.																											

Data / Parameter:	P. 14 EF_{min}
Unit:	tonne N ₂ O/tonne 100% HNO ₃
Description:	Lowest EF _n observed during the first 10 campaigns
Measured/ Calculated / Default:	Calculated
Source of data:	Calculated from monitoring data
Value(s) of monitored parameter:	N.A.
Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	After first ten campaigns of the project crediting period
Calculation method (if applicable):	-
QA/QC procedures:	N.A.
Purpose of data:	Calculation of project emissions.
Additional comment:	N.A.

Data / Parameter:	B. 1 NCSG_{BC}																	
Unit:	mg N ₂ O/Nm ³ (converted from ppm if necessary)																	
Description:	Mean concentration of N ₂ O in the stack gas for the baseline campaign																	
Measured/ Calculated / Default:	Measured																	
Source of data:	AMS (infrared gas analyzer) of Sasolburg and Secunda plants																	
Value(s) of monitored parameter:	Sasolburg: 3,028 / Secunda: 1,451																	
Monitoring equipment:	<table border="1"> <tr> <td>Plant</td><td>Sasolburg</td><td>Secunda</td></tr> <tr> <td>Type</td><td>Infrared Gas Analyser</td><td>Infrared Gas Analyser</td></tr> <tr> <td>Accuracy</td><td>2%</td><td>2%</td></tr> <tr> <td>serial number</td><td>24511-0-204180206004</td><td>24031-0-331004300000</td></tr> <tr> <td>calibration frequency</td><td>QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)</td><td>QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)</td></tr> </table>			Plant	Sasolburg	Secunda	Type	Infrared Gas Analyser	Infrared Gas Analyser	Accuracy	2%	2%	serial number	24511-0-204180206004	24031-0-331004300000	calibration frequency	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)
Plant	Sasolburg	Secunda																
Type	Infrared Gas Analyser	Infrared Gas Analyser																
Accuracy	2%	2%																
serial number	24511-0-204180206004	24031-0-331004300000																
calibration frequency	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)																
Measuring/ Reading/ Recording frequency:	Every two seconds																	
Calculation method (if applicable):	N.A.																	
QA/QC procedures:	According to standard EN 14181. AST is done on an annual basis.																	
Purpose of data:	Calculation of baseline emissions																	
Additional comment:	N.A.																	

Data / Parameter:	B. 2 VSG_{BC}		
Unit:	Nm ³ /hour		
Description:	Mean gas volume flow rate in the stack gas during the baseline campaign		
Measured/ Calculated / Default:	Measured		
Source of data:	AMS (flow meter) at Sasolburg and Secunda plants		
Value(s) of monitored parameter:	Sasolburg: 71,377 / Secunda: 116,409		

Monitoring equipment:	Plant	Sasolburg	Secunda
	Type	Ultrasound principle device	ANNUBAR device (multiple pressure differential principle)
	Accuracy	1-5%	0.1%
	serial number	5428742	0135A
	calibration frequency	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)
Measuring/ Reading/ Recording frequency:	Every two seconds		
Calculation method (if applicable):	N.A.		
QA/QC procedures:	According to standard EN 14181. AST is done on an annual basis.		
Purpose of data:	Calculation of baseline emissions		
Additional comment:	N.A.		

Data / Parameter:	B. 3 Total N₂O emission during the baseline campaign, BE_{BC}
Unit:	tonne N ₂ O
Description:	N ₂ O emission for Baseline campaign
Measured/ Calculated / Default:	Calculated
Source of data:	Monitored data
Value(s) of monitored parameter:	Sasolburg: 1,307.8 / Secunda: 825.3
Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	Calculated at least once at the end after the baseline campaign
Calculation method (if applicable):	-
QA/QC procedures:	N.A.
Purpose of data:	Calculation of baseline emissions
Additional comment:	N.A.

Data / Parameter:	B. 4 OH_{BC}
Unit:	Hour
Description:	Total operating hours for the baseline campaign
Measured/ Calculated / Default:	Measured
Source of data:	Process control system of Sasolburg and Secunda plants

Value(s) of monitored parameter:	Sasolburg: 5,940 hours / Secunda: 4,810 hours
Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	Daily
Calculation method (if applicable):	The distributed control system of each plant (Sasolburg and Secunda) record effective operating time of the plant by monitoring periods when the plants are producing nitric acid.
QA/QC procedures:	Operating time of the plant is cross checked against production logbook data. Critical instruments are calibrated on a routine basis according to the quality assurance system of the plant (ISO 9001).
Purpose of data:	Calculation of baseline emissions
Additional comment:	N.A.

Data / Parameter:	B. 5 NAP _{BC}																	
Unit:	tonne 100% HNO3																	
Description:	Total nitric acid production for the baseline campaign																	
Measured/ Calculated / Default:	Measured																	
Source of data:	Production logs of Sasolburg and Secunda plants																	
Value(s) of monitored parameter:	Sasolburg: 130,069 / Secunda: 172,879																	
Monitoring equipment:	<table><tr><td>Plant</td><td>Sasolburg</td><td>Secunda</td></tr><tr><td>type</td><td>Coriolis type mass flow measurement</td><td>Coriolis type mass flow measurement</td></tr><tr><td>accuracy</td><td>0.1%</td><td>0.02%</td></tr><tr><td>serial number</td><td>3747530(Transmitter) 12034695(Sensor)</td><td>C200BD20000</td></tr><tr><td>calibration frequency</td><td>Every two years</td><td>Exchange and check instrument with every gauze change</td></tr></table>			Plant	Sasolburg	Secunda	type	Coriolis type mass flow measurement	Coriolis type mass flow measurement	accuracy	0.1%	0.02%	serial number	3747530(Transmitter) 12034695(Sensor)	C200BD20000	calibration frequency	Every two years	Exchange and check instrument with every gauze change
Plant	Sasolburg	Secunda																
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serial number	3747530(Transmitter) 12034695(Sensor)	C200BD20000																
calibration frequency	Every two years	Exchange and check instrument with every gauze change																
Measuring/ Reading/ Recording frequency:	Daily																	
Calculation method (if applicable):	Daily production is measured with a very accurate mass flow meter (Coriolis principle), and correcting by the average of several (3 to 5) concentration checkups performed in analytical lab.																	
QA/QC procedures:	Mass balance at the end-product storage tanks is performed on a monthly basis; cross checking of production from mass balance with direct flow measurement is performed routinely. Critical instruments are calibrated on a routine basis according to the quality assurance system of the plant (ISO 9001).																	
Purpose of data:	Calculation of baseline emissions																	
Additional comment:	N.A.																	

Data / Parameter:	B. 6 TSG_{BC}
Unit:	°C
Description:	Temperature of the stack gas during the baseline campaign
Measured/ Calculated / Default:	Measured

Source of data:	AMS (flow meter) at Sasolburg and Secunda plants															
Value(s) of monitored parameter:	Sasolburg: 214.2°C / Secunda: 95.5 °C															
Monitoring equipment:	<table border="1"> <thead> <tr> <th>Plant</th><th>Sasolburg</th><th>Secunda</th></tr> </thead> <tbody> <tr> <td>Type</td><td>Ultrasound principle device</td><td>ANNUBAR device (multiple pressure differential principle)</td></tr> <tr> <td>Accuracy</td><td>1-5%</td><td>0.1%</td></tr> <tr> <td>serial number</td><td>6C039D 04111</td><td>0135A</td></tr> <tr> <td>calibration frequency</td><td>QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)</td><td>QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)</td></tr> </tbody> </table>	Plant	Sasolburg	Secunda	Type	Ultrasound principle device	ANNUBAR device (multiple pressure differential principle)	Accuracy	1-5%	0.1%	serial number	6C039D 04111	0135A	calibration frequency	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)
Plant	Sasolburg	Secunda														
Type	Ultrasound principle device	ANNUBAR device (multiple pressure differential principle)														
Accuracy	1-5%	0.1%														
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Measuring/ Reading/ Recording frequency:	Every two seconds															
Calculation method (if applicable):	N.A.															
QA/QC procedures:	According to standard EN 14181. AST is done on an annual basis.															
Purpose of data:	Calculation of baseline emissions															
Additional comment:	N.A.															

Data / Parameter:	B. 7 PSG_{BC}
Unit:	Bar
Description:	Pressure of the stack gas during the baseline campaign
Measured/ Calculated / Default:	Measured
Source of data:	AMS (flow meter) at Sasolburg and Secunda plants
Value(s) of monitored parameter:	Sasolburg: 0.841 / Secunda: 0.868

Monitoring equipment:	Plant	Sasolburg	Secunda
	Type	Ultrasound principle device	ANNUBAR device (multiple pressure differential principle)
	Accuracy	1-5%	0.1%
	serial number	1494518	0135A
	calibration frequency	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)	QAL2 : Every 3 years AST : Annually (it is not performed the years when QAL2 is performed)
Measuring/ Reading/ Recording frequency:	Every two seconds		
Calculation method (if applicable):	N.A.		
QA/QC procedures:	According to standard EN 14181. AST is done on an annual basis.		
Purpose of data:	Calculation of baseline emissions		
Additional comment:	N.A.		

Data / Parameter:	B. 8 EF_{BL}
Unit:	tonne N ₂ O/tonne 100% HNO ₃
Description:	Baseline N ₂ O Emission Factor
Measured/ Calculated / Default:	Calculated
Source of data:	Calculated from monitored data
Value(s) of monitored parameter:	Sasolburg: 0.0097 / Secunda: 0.00549
Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	N.A.
Calculation method (if applicable):	Calculated once at the end of the baseline campaign
QA/QC procedures:	N.A.
Purpose of data:	Calculation of baseline emissions
Additional comment:	N.A.

Data / Parameter:	B. 9 UNC
Unit:	%
Description:	Overall Uncertainty of the Monitoring System.
Measured/ Calculated / Default:	Calculated
Source of data:	Calculated in the QAL2 tests

Value(s) of monitored parameter:	For Sasolburg: 4.16 / For Secunda: 4.43
Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	N.A.
Calculation method (if applicable):	Data obtained from QAL2 tests carried out by SGS during August 2013.
QA/QC procedures:	N.A.
Purpose of data:	Calculation of baseline emissions
Additional comment:	N.A.

Data / Parameter:	B. 10 AFR																											
Unit:	kg NH ₃ /hour																											
Description:	Ammonia Gas Flow Rate to AOR																											
Measured/ Calculated / Default:	Measured																											
Source of data:	Process control system of Sasolburg and Secunda plants																											
Value(s) of monitored parameter:	<table><tr><td colspan="2">Sasolburg Campaigns</td><td colspan="2">Secunda Campaigns</td></tr><tr><td>8th</td><td>2,648</td><td>7th</td><td>8,088</td></tr><tr><td>9th</td><td>4,226</td><td>8th</td><td>8,724</td></tr><tr><td>10th</td><td>5,420</td><td>9th</td><td>6,979</td></tr><tr><td>11th</td><td>4,621</td><td>10th</td><td>7,780</td></tr><tr><td>12th</td><td>5,420</td><td>11th</td><td>0</td></tr></table>				Sasolburg Campaigns		Secunda Campaigns		8th	2,648	7th	8,088	9th	4,226	8th	8,724	10th	5,420	9th	6,979	11th	4,621	10th	7,780	12th	5,420	11th	0
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calibration frequency	Yearly	Exchange and check instrument with every gauze change before 2007; 3 Yearly with major Shutdown from 2007																										
Measuring/ Reading/ Recording frequency:	Continuously																											
Calculation method (if applicable):	At both plants, ammonia flow to oxidation reactor is tracked by a mass flow measuring device (orifice plate principle) with automatic pressure and temperature compensation; the signal from the device is acquired by the Distributed Control System and stored electronically at a given time interval.																											
QA/QC procedures:	Overall mass balances of ammonia to the plant are performed on a monthly basis to cross check flows and overall conversion efficiency. Critical instruments are calibrated on a routine basis according to the quality assurance system of the plant (ISO 9000).																											
Purpose of data:	Calculation of baseline emissions																											
Additional comment:	N.A.																											

Data / Parameter:	B. 12 AIFR
Unit:	kg NH ₃ /kg air

Description:	Ammonia to air flow ratio to the ammonia oxidation reactor																						
Measured/ Calculated / Default:	Measured																						
Source of data:	Process control system of Sasolburg and Secunda plants																						
Value(s) of monitored parameter:	<table border="1"> <thead> <tr> <th>Sasolburg Campaigns</th><th>Secunda Campaigns</th></tr> </thead> <tbody> <tr> <td>8th</td><td>0.0322</td></tr> <tr> <td>9th</td><td>0.0481</td></tr> <tr> <td>10th</td><td>0.0710</td></tr> <tr> <td>11th</td><td>0.0714</td></tr> <tr> <td>12th</td><td>0.0692</td></tr> <tr> <td>7th</td><td>0.0657</td></tr> <tr> <td>8th</td><td>0.0623</td></tr> <tr> <td>9th</td><td>0.0622</td></tr> <tr> <td>10th</td><td>0.0612</td></tr> <tr> <td>11th</td><td>0.0000</td></tr> </tbody> </table>	Sasolburg Campaigns	Secunda Campaigns	8th	0.0322	9th	0.0481	10th	0.0710	11th	0.0714	12th	0.0692	7th	0.0657	8th	0.0623	9th	0.0622	10th	0.0612	11th	0.0000
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Plant	Sasolburg	Secunda																					
type	Orifice	differential pressure transmitter																					
accuracy	5%	0.10%																					
serial number	not identifiable	824567																					
calibration frequency	Yearly	Exchange and check instrument with every gauze change before 2007; 3 Yearly with major Shutdown from 2007																					
Measuring/ Reading/ Recording frequency:	Every hour																						
Calculation method (if applicable):	Air flow to oxidation reactor is tracked by 2 mass flow measuring devices in series (orifice plate principle); the signal from the device is acquired by the Distributed Control System and stored electronically at a given time interval. The Ammonia to Air ratio is calculated based on the actual flow analysis from the individual streams.																						
QA/QC procedures:	Overall mass balances of ammonia to the plant are performed on a routine basis to cross check flows and overall conversion efficiency.																						
Purpose of data:	Calculation of baseline emissions																						
Additional comment:	N.A.																						

Data / Parameter:	B. 13 CL_{BL}
Unit:	tonne 100% HNO ₃
Description:	Campaign length is defined as the total number of tonnes of nitric acid at 100% concentration produced with one set of gauzes.
Measured/ Calculated / Default:	Calculated
Source of data:	Plant production log book
Value(s) of monitored parameter:	Sasolburg: 130,069 / Secunda: 172,879
Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	Once at the end of baseline campaign.

Calculation method (if applicable):	Daily production is measured by using a flow meter (Magnetic head principle), and correcting by the average of several (3 to 5) concentration checkups performed in analytical lab
QA/QC procedures:	Mass balance at the end-product storage tanks is performed on a monthly basis; cross checking of production measured by mass balance vs direct flow measurement is performed routinely on both plants. Critical instruments are calibrated on a routine basis according to the quality assurance system of the plant (ISO 9001).
Purpose of data:	Calculation of baseline emissions
Additional comment:	N.A.

Data / Parameter:	B. 16 OT _h			
Unit:	°C			
Description:	Oxidation temperature of the ammonia reactor for each hour			
Measured/ Calculated / Default:	Measured			
Source of data:	Process control system of Sasolburg and Secunda plants			
Value(s) of monitored parameter:	Sasolburg Campaigns		Secunda Campaigns	
	8th	854	7th	829
	9th	857	8th	847
	10th	844	9th	783
	11th	769	10th	811
	12th	842	11th	863
Monitoring equipment:	Plant	Sasolburg	Secunda	
	Type	Thermocouples (K-type)	Thermocouples (K-type)	
	accuracy	0.08%	0.10%	
	serial number	N/A	N/A	
	calibration frequency	Yearly	Yearly/ Main Shutdown	
Measuring/ Reading/ Recording frequency:	Every hour			
Calculation method (if applicable):	N.A.			
QA/QC procedures:	New thermocouples are installed on a routine basis when required (off or open signal –meaning the unit is broken).			
Purpose of data:	Calculation of baseline emissions			
Additional comment:	N.A.			

Data / Parameter:	B. 18 OP_h
Unit:	Pa abs
Description:	Oxidation pressure of the ammonia reactor for each hour
Measured/ Calculated / Default:	Measured
Source of data:	Process control system of Sasolburg and Secunda plants

Value(s) of monitored parameter:	Sasolburg Campaigns		Secunda Campaigns	
	8th	327,442	7th	470,349
	9th	384,969	8th	381,811
	10th	367,240	9th	812,141
	11th	307,082	10th	544,708
	12th	370,203	11th	269,185
Monitoring equipment:	Plant	Sasolburg	Secunda	
	type	Pressure transducer	Pressure transducer	
	accuracy	2%	0.10%	
	serial number	1526307	0423C2562941007001	
	calibration frequency	Yearly	Yearly/ Main Shutdown	
Measuring/ Reading/ Recording frequency:	Every hour			
Calculation method (if applicable):	N.A.			
QA/QC procedures:	Critical instruments are calibrated on a routinely basis according to the quality assurance system of the plant (ISO 9001).			
Purpose of data:	Calculation of baseline emissions			
Additional comment:	N.A.			

Data / Parameter:	B. 21 GS_{BL}
Unit:	N.A.
Description:	Gauze supplier for the baseline campaign
Measured/ Calculated / Default:	N.A.
Source of data:	Nitric acid plant procurement office
Value(s) of monitored parameter:	Sasolburg: W.C. Heraeus Secunda: W.C. Heraeus
Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	Once
Calculation method (if applicable):	N.A.
QA/QC procedures:	N.A.
Purpose of data:	Calculation of baseline emissions
Additional comment:	N.A.

Data / Parameter:	B. 22 GS_{project}
Unit:	N.A.
Description:	Gauze supplier for the baseline campaign
Measured/ Calculated / Default:	N.A.
Source of data:	Procurement offices of Sasolburg and Secunda Plants
Value(s) of monitored parameter:	For Sixth and Seventh project campaigns: Sasolburg: W.C. Heraeus Secunda: W.C. Heraeus

Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	Once
Calculation method (if applicable):	N.A.
QA/QC procedures:	N.A.
Purpose of data:	Calculation of project emissions
Additional comment:	N.A.

Data / Parameter:	B. 24 GC_{BL}
Unit:	%
Description:	Gauze composition for the baseline campaign
Measured/ Calculated / Default:	Information provided by the supplier.
Source of data:	Nitric acid plant procurement office and/or gauze supplier technical service department
Value(s) of monitored parameter:	Sasolburg: Pt 55.05 %, Rh 3.75 %, Pd 41.20%. Secunda: Pt 54.45 %, Rh 3.73 %, Pd 41.82 %
Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	Once
Calculation method (if applicable):	N.A.
QA/QC procedures:	N.A.
Purpose of data:	Calculation of baseline emissions
Additional comment:	N.A.

Data / Parameter:	B. 25 GC_{project}
Unit:	%
Description:	Gauze composition for the project campaign
Measured/ Calculated / Default:	N.A.
Source of data:	Procurement offices of Sasolburg and Secunda plants
Value(s) of monitored parameter:	Same composition as the baseline
Monitoring equipment:	N.A.
Measuring/ Reading/ Recording frequency:	Once for each campaign
Calculation method (if applicable):	N.A.
QA/QC procedures:	N.A.
Purpose of data:	Calculation of project emissions
Additional comment:	N.A.

Data / Parameter:	B. 26 EF_{reg}
Unit:	kg N ₂ O/tonne HNO ₃

Description:	Emission level set by incoming policies or regulations, local and national regulations on N2O and NOx emissions
Measured/ Calculated / Default:	N.A.
Source of data:	Local and national regulations
Value(s) of monitored parameter:	No local or national regulation has been introduced during the project period.
Monitoring equipment:	
Measuring/ Reading/ Recording frequency:	To be recorded on date of introduction or change of regulation
Calculation method (if applicable):	N.A.
QA/QC procedures:	N.A.
Purpose of data:	Calculation of baseline emissions
Additional comment:	N.A.

D.3. Implementation of sampling plan

N.A.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

For baseline emission factor determination, N₂O concentration and gas volume flow were monitored throughout the baseline campaign. Hourly average readings for N₂O concentration and gas flow volume (calculated from data monitored every 2 seconds) were collected. Error readings (e.g. downtime or malfunction) and extreme values were eliminated from the output data series.

Normal operating condition determination

To ensure that data obtained during baseline campaign are representative of the actual GHG emissions from the source plant, a set of process parameters known to affect N₂O generation have been set on the basis of design data and the ammonia oxidation catalyst manufacturer. Those parameters, called by the methodology normal operating conditions, are: oxidation temperature, oxidation pressure, ammonia flow to the reactor and ammonia flow to air flow ratio.

Only those N₂O measurements taken when the plant was operating within the permitted range were considered in the calculation of baseline emissions.

After eliminating data measured when the plant was operating outside the permitted conditions, the following statistical procedure was applied.

- Calculated the sample mean ($\bar{x}$);
- Calculated the sample standard deviation (s);
- Calculated the 95% confidence interval (equal to 1.96 times the standard deviation);
- Eliminated all data that lay outside the 95% confidence interval;
- Calculated the new sample mean from the remaining values (volume of stack gas (VSG) and N₂O concentration of stack gas (NCSG)).

Then, baseline emissions were calculated using the following formulae:

$$BE_{BC} = VSG_{BC} \cdot NCSG_{BC} \cdot 10^{-9} \cdot OH_{BC}$$

$$EF_{BL} = \frac{BE_{BC}}{NAP_{BC}} \left(1 - \frac{UNC}{100}\right)$$

Where

BE_{BC}	Total baseline emissions in the baseline measurement period, in, tN ₂ O
VSG_{BC}	Mean stack gas volume flow rate in the baseline measurement period, in Nm ³ /h
$NCSG_{BC}$	Mean concentration of N ₂ O in the stack gas in the baseline measurement period, in mg N ₂ O/Nm ³
OH_{BC}	Number of operating hours in the baseline measurement period, in h
EF_{BL}	Baseline emission factor, in tN ₂ O/tHNO ₃
NAP_{BC}	Nitric acid production during the baseline campaign, in tHNO ₃
UNC	Overall measurement uncertainty of the monitoring system, in %, calculated as the combined uncertainty of the applied monitoring equipment

Another parameter that is measured and must be compared with the normal value is the campaign length.

Normal campaign length (CL_{normal}) values are:

Sasolburg: 114,727 tonnes HNO_3

Secunda: 183,602 tonnes HNO_3

According to AM0034, the baseline campaign length must be lower than or equal to CL_{normal} .

In the case of a project campaign, the campaign length must be greater than or equal to CL_{normal} . If the project campaign length is shorter than CL_{normal} the baseline emission factor must be recalculated eliminating N_2O values obtained beyond CL_n . (This data treatment was clearly detailed in Annex 12 of EB51).

At Sasolburg plant the baseline campaign took place between June 12, 2006 and March 5, 2007.

EF_{BL} calculation was made using values of $NCSG_{BC}$ from June 12, 2006 to February 3, 2007 in order not to exceed normal campaign length.

For Sasolburg, EF_{BL} used was 0.0097 tonne N_2O /tonne 100% HNO_3

At Secunda plant the baseline campaign took place between August 29, 2006 and March 23, 2007.

For Secunda, EF_{BL} used was 0.00549

E.2. Calculation of project emissions or actual net GHG removals by sinks

For project emission factor determination, N_2O concentration and gas volume flow for each plant were monitored throughout the project campaign. Hourly average readings for N_2O concentration and gas volume flow (calculated from data monitored every 2 seconds) were collected. Error readings (e.g. downtime or malfunction) and extreme values were eliminated from the output data series.

Next, the same statistical evaluation that was applied to the baseline data series was applied to the project data series.

The mean values of N_2O concentration at the stack gas and volume flow rate at the stack gas were used in the following formula (Eq. 3 from AM0034) to calculate project emissions:

$$PE_n = VSG_n \cdot NCSG_n \cdot 10^{-9} \cdot OH_n$$

$$EF_n = \frac{PE_n}{NAP_n}$$

Where

PE_n	Total project emissions of the n th campaign, in t N_2O
VSG_n	Mean stack gas volume flow rate for the n th project campaign, in Nm ³ /h
$NCSG_n$	Mean concentration of N_2O in the stack gas for the project campaign, in mg N_2O /Nm ³
OH_n	Number of operating hours in the project campaign, in h
EF_n	Emission factor calculated for the n th campaign, in t N_2O /t HNO_3
NAP_n	Nitric acid production in the n th campaign, in t 100% HNO_3

Derivation of a moving average emission factor

The methodology proposes the calculation of a moving average emission factor in order to take a conservative approach in emission reduction calculation. The maximum value between EF_n for the specific project campaign and the EF_{ma,n} shall be used in the emission reduction calculation as EF_p emission factor.

EF_{ma,n} is calculated as follows:

$$EF_{ma,n} = \frac{EF_1 + EF_2 + \dots + EF_n}{n} (\text{tonneN}_2\text{O} / \text{tonneHNO}_3)$$

If $EF_{ma,n} \geq EF_n$, then $EF_p = EF_{ma,n}$

If $EF_{ma,n} < EF_n$, then $EF_p = EF_n$

Where

- EF_n Emission factor calculated for the nth campaign, in tonne N₂O/tonne HNO₃
- EF_{ma,n} Moving average (ma) emission factor after nth campaign, including the current campaign, in tonne N₂O/tonne HNO₃
- n Number of campaigns to date
- EF_p Emission factor that will be applied to calculate the emission reductions from this specific campaign, in tonne N₂O/tonne HNO₃

This process is repeated for each campaign so that a moving average, EF_{ma,n}, is established over time, becoming more representative and precise with each additional campaign.

Project Campaign Length

a) Longer Project Campaign

If the length of each individual project campaign CL_n is longer than or equal to the average historic campaign length CL_{normal}, then all N₂O values measured during the project campaign can be used for the calculation of EF_{BL}.

b) Shorter Project Campaign

If CL_n < CL_{normal}, recalculate EF_{BL} by eliminating those N₂O values that were obtained during the production of tonnes of nitric acid beyond the CL_n (i.e. the last tonnes produced) from the calculation of EF_n

E.3. Calculation of leakage

N.A.

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

As indicated, the present Monitoring Report involves the following period: From September 10, 2010 to July 31, 2011.

According to AM0034 version 2, the emission reductions for the project activity over a specific campaign are determined as follows:

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

Where

ER_n	Emission reductions of the project for the n th campaign, tCO ₂ e
EF_{BL}	Baseline emission factor, in tN ₂ O/tHNO ₃
EF_p	Project emission factor, applicable to the n th campaign, in tN ₂ O/tHNO ₃
NAP_n	Nitric acid production during the n th campaign of the project activity, in tHNO ₃
GWP_{N_2O}	Global warming potential of N ₂ O, set as 310 tCO ₂ e/tN ₂ O for the 1 st commitment period

Values obtained for the project are:

Sasolburg plant

$$8\text{th project campaign: } ER_n = (0.0097 - 0.00088) \cdot 108,682 \cdot 298 = 285,598 \text{ tonneCO}_2\text{e}$$

$$9\text{th project campaign: } ER_n = (0.0097 - 0.00174) \cdot 130,873 \cdot 298 = 310,441 \text{ tonneCO}_2\text{e}$$

$$10\text{th project campaign: } ER_n = (0.0097 - 0.00126) \cdot 106,083 \cdot 298 = 266,810 \text{ tonneCO}_2\text{e}$$

$$11\text{th project campaign: } ER_n = (0.0097 - 0.00100) \cdot 82,117 \cdot 298 = 212,798 \text{ tonneCO}_2\text{e}$$

$$12\text{th project campaign: } ER_n = (0.0097 - 0.00098) \cdot 14,877 \cdot 298 = 38,676 \text{ tonneCO}_2\text{e}$$

Secunda plant

$$7\text{th project campaign: } ER_n = (0.00549 - 0.00075) \cdot 461,027 \cdot 298 = 650,817 \text{ tonneCO}_2\text{e}$$

$$8\text{th project campaign: } ER_n = (0.00549 - 0.00072) \cdot 274,787 \cdot 298 = 390,393 \text{ tonneCO}_2\text{e}$$

$$9\text{th project campaign: } ER_n = (0.00549 - 0.00133) \cdot 55,929 \cdot 298 = 69,334 \text{ tonneCO}_2\text{e}$$

The table below shows baseline emissions, project emissions, leakage and emission reductions per campaign at each plant.

Plant / Campaign Number	Baseline emissions (tonne CO ₂ e)	Project emissions (tonne CO ₂ e)	Leakage (tonne CO ₂ e)	Emission reductions (tonne CO ₂ e)
Sasolburg 8th	314,155	28,557	0	285,598
Sasolburg 9 th	378,301	67,860	0	310,441
Sasolburg 10th	306,642	39,831	0	266,810
Sasolburg 11th	237,367	24,568	0	212,798
Sasolburg 12th	43,004	4,327	0	38,676
Secunda 7th	754,249	103,432	0	650,817
Secunda 8th	449,556	59,162	0	390,393
Secunda 9th	91,501	22,166	0	69,334

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO ₂ e)
Total	2,574,775	349,906	0	2,224,867

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO ₂ e)	2,845,298	2,224,867

E.6. Remarks on difference from estimated value in registered PDD

The abovementioned amount of CERs was generated during the monitoring period, from August 1, 2011 to May 24, 2014.

The actual operational days during the monitoring period at Sasolburg plant were 1028 full days of 24 hours. The PDD estimated 515,837 t CO₂e per year considering 347 operating days. For a period of 1028 days the estimated value would be 1,528,495 CERs.

The operational days during the monitoring period at Secunda were 1028. The PDD estimated 444,485 t CO₂e per year considering 347 operating days. For a period of 1028 days the estimated value would be 1,316,803 t CO₂e.

The actual number of CERs generated during the monitoring period is lower than the number estimated in the PDD.

E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO ₂ e)	1,545,159	641,032

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Appendix 1. Contact information of project participants and responsible persons/ entities

Project participant and/or responsible person/ entity	☒ Project participant ☒ Responsible person/ entity for completing the CDM-MR-FORM
Organization name	MGM Carbon Portfolio S.a.r.l.
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Project participant and/or responsible person/ entity	☒ Project participant ☐ Responsible person/ entity for completing the CDM-MR-FORM
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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
04.0	25 June 2014	Revisions to: • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.
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