EcoSecurities International Ltd.

CDM Monitoring Report

Chuanhua N2O Abatement Project

Project CDM ID: 1781

Project registration date: 24 Oct 2008

Monitoring period: 24 Oct 2008 – 15 Nov 2009

25 May 2010 ver2

1. Project background

Project 1781: Chuanhua N2O Abatement Project has been registered as CDM project by the UNFCCC on 24 Oct 2008.

Further background on this project can be found in the PDD and associated documents, which are available on the UNFCCC website: http://cdm.unfccc.int/Projects/DB/SGS-UKL1207592227.78/view.

Parties involved are China (Host Country), the United Kingdom of Great Britain and Northern Ireland (Other Parties). The project participants are Sichuan Chemical Co. Ltd. (Public entity), and EcoSecurities Group PLC.

2. Project implementation in relation to registered PDD

The project is implemented and operated as per registered PDD.

2.1. Implementation status

The project uses the secondary N2O abatement catalyst technology, which involves the installation of a secondary catalyst in the ammonia burner basket. The secondary catalyst was located beneath the ammonia oxidation catalyst gauzes, and through this secondary catalyst N2O will be converted into Nitrogen (N2) and Oxygen (O2), which have no adverse environmental or human health impacts. This is in conformity with the PDD. Baseline monitoring started on 23 August 2008.

2.2. Operation of the project

The project was fully operational per 18 Mar 2009 [installation of primary catalyst]. The secondary abatement catalyst was installed on 17 May 2009. The start of the project campaign was characterized by the installation of a new set of primary catalyst gauzes in the oxidation reactor, which is consistent with the methodology. The project has been operating since 18 Mar 2009. “Operational” in this context includes downtime due to maintenance or technical issues.

2.3. Forecasted emission reductions versus actual emission reductions

The forecasted emission reduction in the PDD is 372,612 tCO2e per year [330 operation days] based on a baseline emission factor of 0.019 tN2O/tHNO3, a project emission factor of 0.004 tN2O/tHNO3, and nitric acid production of 48,832 tHNO3 for one project campaign. The actual emission reductions over this monitoring period [243 days] were 173,130 tCO2e, which is equivalent to 235,115 tCO2e per year [330 days]. This is lower than forecasted in the PDD, bearing in mind the following factors:

1. Emission reduction in PDD was an ex-ante estimation based on available data at that time, when the baseline campaign was not yet finished. Actual emission reduction was calculated based on data monitored after end of the campaign.

2. The project emission factor forecasted in PDD was based on 80% abatement efficiency. Actual abatement efficiency [approximately 50%] was much lower than expected. This gives a higher EFp than estimated in PDD and hence less emission reductions.

3. Compliance of the monitoring plan with the monitoring methodology

This project has been registered under methodology AM0034 ver.2. The project has not sought revision or deviation to the monitoring plan previously. The validated monitoring plan is therefore in accordance with the approved methodology applied to the CDM project activity.

4. Compliance of monitoring with the monitoring plan

Monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD.

4.1. Monitoring period

The monitoring period covers the period from 24 Oct 2008 to 15 Nov 2009. Baseline campaign started on 23 Aug 2008 and ended on 17 Mar 2009. Project campaign started on 18 Mar 2009. No emission reductions were or would be claimed for the period between 24 Oct 2008 and 17 Mar 2009. The emission reductions for this monitoring period start on 18 Mar 2009. The starting date of this monitoring period is the same as the registration date [24 Oct 2008]. The ending date is before the end of the crediting period [23 Oct 2015].

4.2. Monitoring parameters

Data/parameter:	P.1 NCSG
Data unit:	mgN_2O/m^3
Description:	N_2O concentration in stack gas
Source of data used:	Gas analyser
Recording frequency:	Every 2 seconds
Value for this monitoring period:	3,119
Description of measurement methods and procedures applied:	A sample is continuously extracted from the stack using a sampling probe and conditioning system. The dried sample is analyzed using an infrared gas analysis optical bench (non-dispersive infra-red absorption analyser). The analysis result is recorded on a Data Storage Unit. Raw data are

	processed with software and made accessible with a dedicated PC.
QA/QC procedures applied:	Staff was trained for the calibration, operation and regular maintenance of the Automated Monitoring System. The training materials are developed in close collaboration with the supplier of analyzer. Only trained staff is allowed to operate and calibrate the analyzer. A detailed set of procedures and forms has been developed for daily checks, start-up after shutdown of the plant, zero and span calibrations, maintenance and analyzer failures. Daily checks comprise the whole stack sampling system (sample gas probe, flow meter and analyzer). Related procedures are signed off by EcoSecurities and confirmed by the manufacturer of the analyzer. Completed forms are stored at the office of the CDM manager on site. Trained staff follows procedures to report any abnormalities or equipment failure. A reliable technical support infrastructure had been established based locally in China as well as regular support from the manufacturer. Data errors are flagged in a software application installed on PC onsite. Measured data are continuously checked for anomalies by the site staff. EcoSecurities downloads the data files from the analyzer in order to check it for abnormal values or trends. A parallel measurement [QAL2] was done by accredited laboratory as per the requirement of EN14181. In the event that the monitoring system is down, the highest measured value in the campaign will be applied for the downtime period for the campaign emission factor. The correct functioning of the analyzer is assessed during the daily checks and during calibrations [QAL3].
Comments:	Monitored from the start of the project. Archived data will be kept for 2 years after the end of the crediting period.

Data/parameter:	P.2 VSG
Data unit:	Nm^3/h
Description:	Normal gas volume flow rate of the stack gas during the project campaign
Source of data used:	Averaging pitot tube flow meter for corrosive applications
Recording frequency:	Every 2 seconds
Value for this monitoring period:	32,659
Description of measurement methods and procedures applied:	The normalized flow rate is calculated from the differential pressure measured by the pitot tube. The flow rate is calculated and transmitted to the Data Storage Unit (DSU) using a multivariable transmitter. The flow meter measures flow rate (m3/h). The flow is converted into Nm3 (273.15 K and 101.325 kPa) using stack gas temperature and stack gas pressure measured.
QA/QC procedures applied:	The flow meter was installed by the supplier of the stack monitoring system. Site staff had received training on the maintenance checks of the flow meter to ensure that it remains fully operational. The flow meter was factory calibrated and was periodically calibrated in accordance with the manufacturer's recommendations. The measured values are constantly checked by site staff. EcoSecurities downloads data files from the DSU in order to check for anomalies. A parallel measurement [QAL2] was done by accredited laboratory as per the requirement of EN14181.
Comments:	Monitored from the start of the project. Archived data will be kept for 2 years after the end of the crediting period.

Data/parameter:	P.3 PE_n
Data unit:	tN_2O
Description:	N_2O emissions of the project campaign
Source of data used:	Calculation from measured data
Recording frequency:	At least once after each campaign

Value for this monitoring period:	571
Description of measurement methods and procedures applied:	According to AM0034 Ver 02 the parameter was calculated using equation (3)
QA/QC procedures applied:	The QA/QC for the input parameters NCSG, VSG and OH apply. OH is calculated on the basis of hourly records by the site staff [process data].
Comments:	None

Data/parameter:	P.4 OH
Data unit:	Hours
Description:	Operating hours during the project campaign
Source of data used:	Production log
Recording frequency:	Daily, compiled for entire campaign
Value for this monitoring period:	5,604
Description of measurement methods and procedures applied:	The operation hours were recorded in the production log during each project campaign.
QA/QC procedures applied:	The plant records process parameters on a dedicated CDM form. This form is collected by the CDM manager, and checked for completeness and accuracy.
Comments:	None

Data/parameter:	P.5 NAP
Data unit:	$tHNO_3$
Description:	Nitric acid (100% concentrated) over the project campaign
Source of data used:	Production log
Recording frequency:	Every 8 hours
Value for this monitoring period:	54,816
Description of	The flow of nitric acid is measured using a magnetic

measurement methods and procedures applied:	flow meter. The flow is converted into 100% acid flow by multiplying by its density and concentration. Density and concentration of HNO3 is measured by site staff. The nitric acid flow is then calculated on 100% basis. There was weak acid produced during start-up of the plant before the process went completely stable. To avoid overestimation of acid production and to be conservative, it was deducted from total production. This weak acid deduction process had been applied to historic campaigns and project campaigns. It was not deducted from baseline campaign. This is conservative.
QA/QC procedures applied:	NAP was cross-checked with other process data. The flow meter was factory calibrated and was further calibrated by accredited party. The production management system of the plant has been certified according to ISO9001.
Comments:	None

Data/parameter:	P.6 TSG
Data unit:	Degrees Centigrade (ºC)
Description:	Temperature of stack gas
Source of data used:	Temperature probe
Recording frequency:	Every 2 seconds
Value for this monitoring period:	101(typical value)
Description of measurement methods and procedures applied:	The temperature of the stack gas is used to normalize the volume flow (Nm3/h), which is measured from the probe next to the volume flow meter. TSG is measured and recorded every 2 seconds and the normalized VSG is calculated directly by the flow computer.
QA/QC procedures applied:	The temperature measurement was displayed on the PC software which was regularly checked by EcoSecurities, which has remote access to the data. Any abnormalities would be reported to EcoSecurities. Calibrations were performed

	according to the recommendation of the supplier.
Comments:	None

Data/parameter:	P.7 PSG
Data unit:	mBar
Description:	Pressure of stack gas
Source of data used:	Pressure transmitter.
Recording frequency:	Every 2 seconds
Value for this monitoring period:	951(typical value)
Description of measurement methods and procedures applied:	The pressure is used to normalize the volume flow of the stack to 101.325 kPa. Pressure was measured as a part of the flow meter's function. PSG is measured and recorded every 2 seconds and the normalized VSG is calculated directly using a flow computer.
QA/QC procedures applied:	The pressure measurement was displayed on the PC software which was regularly checked by EcoSecurities, which has remote data access. Any abnormalities would be reported to EcoSecurities. Calibrations were performed according to the recommendation of the supplier.
Comments:	None

Data/parameter:	P.8 EF_n
Data unit:	$tN_2O/tHNO_3$
Description:	Emission factor calculated for the project campaign
Source of data used:	Calculated
Recording frequency:	After end of each campaign
Value for this monitoring period:	0.01046
Description of measurement methods and procedures applied:	According to AM0034 Ver 02 the parameter was calculated using Equation (4).
QA/QC procedures applied:	The QA/QC for the input parameters that are required to calculate EF_n are described in P.1, P.2,

	P.3, P.5, P.6 and P.7. Calculations and a final check of the calculations were done by different people as a cross check.
Comments:	None

Data/parameter:	P.9 EF_{man}
Data unit:	$tN_2O/tHNO_3$
Description:	Moving average emissions factor derived over time from campaign specific emission factors.
Source of data used:	Calculated from campaign emissions factors EF_n
Recording frequency:	After end of each campaign
Value for this monitoring period:	Not applicable
Description of measurement methods and procedures applied:	According to AM0034 Ver 02 the parameter was calculated using Equation (5).
QA/QC procedures applied:	Not applicable.
Comments:	None

Data/parameter:	P.10 CL_n
Data unit:	$tHNO_3$
Description:	Campaign length measured in metric tonnes of 100% concentrated nitric acid produced during the project campaign.
Source of data used:	Calculated from nitric acid production data
Recording frequency:	After end of each campaign
Value for this monitoring period:	54,816
Description of measurement methods and procedures applied:	Calculated according to AM0034 ver 2 after the end of each campaign, based on every tonne of nitric acid produced, regardless of whether the measured NCSG and VSG data were excluded from the calculation.
QA/QC procedures applied:	See P.5

Comments:	Design capacity of the facility is 98,550 t 100%HNO_3 per year [365 days]. CL_{normal} was 43,955t. CL_n for the project campaign [54,816 tHNO3] is greater than CL_{normal} [43,955 tHNO3], hence all N2O values measured during the baseline campaign can be used for the calculation of EF. This is in line with the requirement of AM0034. CL_n for the project campaign [54,816t nitric acid in 243 days] is equivalent to 82,337 t 100%HNO_3 per year [365 days], which is within the design capacity.

Data/parameter:	P.11 EF_p
Data unit:	$tN_2O/tHNO_3$
Description:	Emission factor applied to calculate the emission reductions from this specific campaign
Source of data used:	Calculated
Recording frequency:	After end of each campaign
Value for this monitoring period:	0.01046
Description of measurement methods and procedures applied:	Calculated according to AM0034 ver 2 Equation (6).
QA/QC procedures applied:	The QA/QC for the input parameters that are required to calculate EF_n are described in P.1, P.2, P.3, P.5, P.6, P.7 and P.8. Calculations and a final check of the calculations were done by different people.
Comments:	None

Data/parameter:	P.12 EF_{min}
Data unit:	$tN_2O/tHNO_3$
Description:	Minimum emissions factor after 10 campaigns
Source of data used:	Calculated
Recording frequency:	After end of 10th campaign
Value for this monitoring period:	Not applicable

Description of measurement methods and procedures applied:	To be determined after 10 project campaigns. The lowest value of 10 project campaign emissions factors.
QA/QC procedures applied:	The QA/QC for the input parameters that are required to calculate EFn are described in P.1, P.2, P.3, P.5, P.6, P.7 and P.8. Calculations and a final check of the calculations would be done by different people.
Comments:	None

Data/parameter:	P.13 OT_h
Data unit:	Degrees Centigrade (°C)
Description:	Hourly oxidation temperature during project campaign
Source of data used:	Thermocouples inside AOR
Recording frequency:	Every hour
Value for this monitoring period:	862 (average)
Description of measurement methods and procedures applied:	Monitored by thermocouples inside the ammonia burner. Data recorded every hour.
QA/QC procedures applied:	The plant is ISO9001 certified. The management in the instrument department is covered under the ISO 9001 QA/QC system. Equipment was calibrated according to site's own management requirements.
Comments:	None

Data/parameter:	P.14 OP_h
Data unit:	MPa
Description:	Hourly oxidation pressure of AOR during project campaign
Source of data used:	Monitored by pressure meter
Recording frequency:	Every hour
Value for this monitoring period:	0.32 (average)

Description of measurement methods and procedures applied:	Monitored by pressure meter. Data recorded every hour.
QA/QC procedures applied:	The plant was certified by ISO9001 and this status is renewed regularly. The management in the instrument department is part of the procedures. Equipment was calibrated according to site's own management requirements.
Comments:	None

Data/parameter:	P.15 AFR
Data unit:	m^3/h
Description:	Ammonia gas flow rate to AOR during project campaign
Source of data used:	Ammonia gas flow meter
Recording frequency:	Every hour
Value for this monitoring period:	4874 (maximum)
Description of measurement methods and procedures applied:	Monitored by ammonia flow meter. Data recorded every hour.
QA/QC procedures applied:	The plant was certified by ISO9001 and this status is renewed regularly. The management in the instrument department is part of the procedures. Equipment was calibrated according to site's own management requirements.
Comments:	None

Data/parameter:	P.16 AIFR
Data unit:	% v/v of NH_3 in air
Description:	Ammonia to air ratio in AOR
Source of data used:	Calculated from ammonia gas flow rate and primary air flow rate
Recording frequency:	Every hour
Value for this	11.64 (maximum)

monitoring period:	
Description of measurement methods and procedures applied:	Primary air flow rate was monitored by air flow meter. Ammonia to air ratio was then calculated. Data recorded every hour.
QA/QC procedures applied:	The plant was certified by ISO9001 and this status is renewed regularly. The management in the instrument department is part of the procedures. Equipment was calibrated according to site's own management requirements.
Comments:	None

4.3. Primary catalyst

The composition of the primary catalyst and the supplier did not change from historic campaign, baseline campaign to project campaign. Therefore GSbaseline = GSproject and GCbaseline = GCproject.

4.4. Management and operational system

The responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan.

4.5. Quality assurance and quality control

The accuracy of the monitoring results are in conformity with calibration requirements, recording frequency and quality assurance and quality control procedures stated in the monitoring plan. In case of doubt, suppliers of monitoring equipment have been contacted and conservative assumptions made.

EN14181 applies to the stack monitoring system. The supplier of the N2O analyzer has issued a QAL1 certificate as per ISO 14956. The plausibility of this certificate has been evaluated and then assured by an independent accredited laboratory, indicating that the certificate is in accordance with EN 14181 and ISO 14956. During EB48 meeting [paragraph 77] it was decided that "the Board further clarified that the suitability test QAL 1 for the AMS by any entity is acceptable provided that a documentary evidence is submitted which confirms the measures and method conducted are in accordance with the provisions specified in ISO14956." This requirement was fulfilled. An independent accredited laboratory has carried out QAL2 measurements, resulting in an uncertainty factor [UNC] and a correction factor for both VSG and NCSG. The site carries out QAL3 management in close collaboration with EcoSecurities and the supplier of the equipment.

4.5.1. Calibration of monitoring equipment

All required monitoring equipments were calibrated once per year by accredited parties. Detailed calibration information is listed in table below.

Meter	Parameter	Type Tag no.	Calibration date	Calibrated by
Air flow meter	AIFR [calculated by Ammonia flow and air flow]	EJA110A DMS4A-95EA	20/08/2008 17/03/2009	Sichuan chemical Co., Ltd.
Ammonia flow meter	AFR	EJA110DMS 2B-90EA	20/08/2008 17/03/2009	Sichuan chemical Co., Ltd.
Ammonia oxidation thermocouple	OT	K	20/08/2008 17/03/2009	Sichuan chemical Co., Ltd.
Oxidation pressure meter	OP	YA-150	19/08/2008 17/03/2009	Sichuan chemical Co., Ltd.
Nitric acid flow meter	NAP	AE206MG	20/08/2008 13/05/2009	National Institute of Measurement and Testing Technology
AMS	VSG PSG TSG NCSG	5A	February 2008 March 2009 July 2009	QAL2 and AST tested by accredited third party

4.5.2. Monitoring frequency

The parameters to be monitored were measured and recorded with the frequency indicated in section 4.2 of this document. This corresponds with the requirements from methodology AM0034 ver.2 and the validated monitoring plan.

4.5.3. Monitoring system

Monitoring organisation

A monitoring organization has been set up. This involved setting up an organization and the development of procedures for

a) Daily check of monitoring equipment

b) Gas analyser breakdown

c) Gas analyser calibration

d) Calibration gas management

e) Power outage

f) Process shutdown

g) Process data recording

CDM staff training has taken place and this can be proven by training records which are available on site. Procedures for data collection, archiving and data quality assurance and quality control were described in related procedures.

Monitoring equipment and installation

The meters were installed by qualified technicians and the proper functioning thereof has been proven. EN14181 is applicable for QA/QC of the stack monitoring equipment. The supplier of the N_2O analyzer has issued installation certificates for the flow meter, sample system and analyzer. The supplier did also issue QAL1 certificates. An independent accredited laboratory has carried out QAL2 parallel stack measurements. AMS used in the project passed the QAL2 test. QAL3 is carried out by the site staff in close collaboration with EcoSecurities and the equipment supplier.

Data records and management

Data records are filed electronically each month and kept for 2 years after the end of the crediting period.

Internal audits

The implementation of the procedures is checked regularly by EcoSecurities during field visits and/or the consistency and plausibility of the data which are processed each month.

4.5.4. Forward Action Requests

No forward action requests remain from the validation. This is the first periodic verification of the project, no previous verifications before.

4.6. Data completeness

All data for this project campaign was monitored in accordance with the registered PDD.

4.7. Cross checks of monitoring data

Acid production data was cross checked by fertilizer production data. Events like meter failure or process shut down are registered as required by the procedures. Implementation of the procedures is regularly checked by EcoSecurities. Cross checks applied during this period showed that the data used in the calculation of emission reductions are reliable.

4.8. Historic campaigns

Historical data for the operating range of temperature and pressure and operating data for hourly ammonia gas and ammonia to air ratio from the previous five campaigns were collected. The permitted operating conditions were calculated according to section 1.i and 1.ii of the methodology.

4.9. Calculation of baseline data

Hourly recorded process data including OT, OP, AFR, AIFR were compared against permitted operation conditions. More than 50% [98.5% in this case] of baseline data were within permitted operation conditions.

Since $CL_{BL}>CL_{normal}$, N_2O values that were measured beyond the length of CL_{normal} during the production of the quantity of nitric acid (i.e. the final tonnes produced) were eliminated from the calculation of EF_{BL}.

Total nitric acid production and total operation hours of the baseline campaign were used for calculation of EF_{BL}. This is in compliance with the approved methodology AM0034 ver 2 (Page 6, "…total number of complete hours of operation…"; see also AM0034 ver 3.3 page 6 footnote 3 ".

In line with the clarification provided in EB51 Annex 12, it was ensured that only NCSG values for which $CL_{BL}>CL_{normal}$ have been removed from the calculation of EF_{BL}. We have therefore maintained VSG values for which $CL_{BL}>CL_{normal}$, provided that the plant is operating within the permitted operating range.

4.10. Calculation of emission reductions

Calculation of emission reductions took place on the basis of a complete set of cross checked data, applying the approved methodology. No assumptions were made in the calculations. IPCC default emission factor was used for downtime during baseline campaign as required per AM0034 v2.

The start date of this project campaign is 18 Mar 2009 [installation of primary catalyst]. Secondary abatement catalyst was installed later on 17 May 2009 due to unexpected late arrival of abatement catalyst. Stack data [NCSG and VSG] monitored for the period between 18 Mar 2009 and 16 May 2009 were still used in the calculation of average NCSG and VSG of the project campaign. Since NCSG value monitored without the presence of secondary abatement catalyst is high, calculated campaign average NCSG value is higher. Therefore EF_p for this campaign is higher and less emission reductions were calculated. This is conservative.

The nitric acid production during the project campaigns did not exceed the design capacity expressed on a 365 days/year basis.

All calculations relevant to the emission reductions are included in the Annexes of this monitoring report. This includes: historic campaigns [Annex A], baseline campaign [Annex B], and project campaign [Annex C].

4.11. Assumptions in emission calculations

No assumptions were required when calculating the emission reductions over the monitoring period other than stated in the validated PDD.

4.12. Application of emission factors, IPCC default values and other reference values

No emission factors, IPCC default factors or other reference values have been used that were not stated in the validated PDD or in the approved methodology.

5. Summary

CDM project 1781: Chuanhua N2O Abatement Project, CDM has reduced 173,130 tCO2e in the period 24/10/2008 to 15/11/2009. The emission reduction has been calculated as set out in the validated PDD and the approved methodology. The project activity is implemented as set out in the validated PDD. The validated monitoring plan is in accordance with the approved methodology. Monitoring has been carried out as per validated monitoring plan.

Annex A – Historic campaign

	OT (°C)	OP (Mpa)	AFRmax (m3/h)	AFRmax (kg NH3/h)	AIFRmax (%)
2.5 Percentile	837	0.27			
97.5 Percentile	847	0.33			
Max			4660	3448	12.35

	Corrected NAP	
campaign 1	46,353	t HNO3
campaign 2	31,681	t HNO3
campaign 3	43,637	t HNO3
campaign 4	43,846	t HNO3
campaign 5	54,259	t HNO3
sum	219,776	t HNO3
CL normal	43,955	t HNO3

Annex B – Baseline campaign

calc CI	N2O (mg/Nm3)	FLOW (Nm3/hr)
average	6,083	34,360
SD	2,651	2,184
CI low	886	30,079
CI high	11,279	38,640

	N2O (mg/Nm3)	FLOW (Nm3/hr)
Meth mean	6,174	34,553

VSGcalc	34,553	Nm3/hr
NCSGcalc	6,174	mg N2O/Nm3
OH	4,723	hrs
BE	1,007	ton N2O

NAPbc	45,217	tHNO3
UNC AMS	4.76%	-
UNC NAP	0.50%	-
UNC combined	4.79%	-
EFbl	0.02121	t N2O/t HNO3
	21.21	kg N2O/tHNO3

Hrs mon system down	160	hrs
OH	4,723	hrs
%	3.39%	
EF default	4.50	kg N2O/tHNO3
weighed	0.15	kg N2O/tHNO3
EF calc	21.21	kg N2O/tHNO3
weighed	20.50	kg N2O/tHNO3
EFbl final	20.65	kg N2O/tHNO3
	0.02065	t N2O/tHNO3

Annex C – Project campaign

calc CI	N2O (mg/Nm3)	FLOW (Nm3/hr)
average	2,937	32,780
SD	1,006	1,269
CI low	965	30,292
CI high	4,910	35,267

	N2O (mg/Nm3)	Flow (Nm3/hr)
Meth mean	3,119	32,659

VSGcalc	32,659	Nm3/hr
NCSGcalc	3,119	mg N2O/Nm3
OH	5,604	hrs
PE1	571	ton N2O

NAPp1	54,816	tHNO3
EFp1	0.01041	t N2O/t HNO3
	10.41	kg N2O/tHNO3

Hrs mon system down	38	hrs
OH	5,604	hrs
%	1%	-
EF AMS down	17.44	kg N2O/tHNO3
weighed	0.12	kg N2O/tHNO3
EF calc	10.41	kg N2O/tHNO3
weighed	10.34	kg N2O/tHNO3
EFp1 final	10.46	kg N2O/tHNO3
	0.01046	t N2O/tHNO3

EFbl	20.65	kg N2O/tHNO3
	0.02065	t N2O/tHNO3
GWP N2O	310	-
ER	173,130	tCO2e