Clean Development Mechanism South Africa
Designated National Authority

energy
Department:
Energy
REPUBLIC OF SOUTH AFRICA

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Project Design Document (PDD)

Project reference number (office	
Date received (office use only)	

NOTES ON COMPLETING THIS PROJECT DESIGN DOCUMENT

1. Please provide this PDD in both hard-copy

Part A: Project Proponent Details

Project Name	Omnia N2O Abatement Project II
Date of Submission of PDD	

Project Developer	
Name	*Omnia Fertilizer, Division of Omnia Group (Pty) Ltd., South Africa ("Omnia")*
Organizational Category	*Private Company*
Legal Status	*(Pty) Ltd*
Street Address	Eugene Houdry Street Sasolburg Free State
Postal Address (if different from above)	P. O. Box 384 Sasolburg Free State Province 1947
Website Address	www.omnia.co.za
Main Activities	Omnia Group (Pty) Ltd is a diversified, specialist chemical services company providing customised solutions in the chemical, mining

	and agriculture markets. Omnia's Agricultural division comprises of Omnia Fertilizer and Omnia Specialities, which are marketed to farmers as a holistic offering branded Omnia Nutriology®, a unique concept that denotes "the science of growing". As a complete solution for the modern farmer, Nutriology® brings together the broad base of knowledge, technologies, products and services that Omnia's agricultural businesses have built up over more than 50 years. With an ever-expanding base of new technologies and specialist application expertise, Omnia's agricultural businesses are at the forefront of the growing specialism in farming.
Summary of Financial Performance in last fiscal year	Audited Financial Results Fiscal Year ending March 2011 Revenues 9,368 Rm Profit 451 Rm Equity 3,339 Rm
Contact Person(s)	Eden Jack
Telephone	Work: +27 16 970 7200 Cell: +27 83 655 4617
Fax	+ 27 16 976 1924
Email Address	ejack@omnia.co.za
Project Partners Provide the following Information for **all** project partners (copy and paste relevant sections of the table if information is to be provided on more than one partner organisation)	
Name	N/A
Nature of partner	*Describe nature of relationship with partner*
Organizational Category	*Select most applicable:* *National Government/ Government Agency/ provincial Government/ Municipality/ Private Company/ Non-Governmental Organisation/ Other (give details)*
Legal Status (if private company)	*For example: Privately held company/ limited company/ limited partnership etc.*
Street Address	
Postal Address (if different to Street Address)	
Website Address	
Main Activities	*(Not more than 1 paragraph)*
Contact Person(s)	Name

Telephone	Work: Cell:
Fax	
Email Address	
Contractual Arrangements	
Contractual arrangements between various entities involved	*Provide a brief description of the contractual and/or legal relationship(s) between the various key business entities including owner(s) of the future CERs. (If applicable)*

Part B: Project Overview (Technical Summary, Location and Schedule)

Technical Summary of the project	
Objective of the Project	*Describe in less than 5 lines* Nitrous Oxide (N2O) is an undesired by-product of the nitric acid (HNO3) production process at the synthetic fertilizer production facility. The aim of the project activity is to reduce N2O emissions in the tail gas by installing a tertiary catalyst after the absorption unit.

Project Description

The project activity entails the installation of:

- Tertiary N2O abatement technology,
- Specialized monitoring equipment that is installed at the tail gas stream after the abatement of N2O emissions.

Catalyst Technology

In the production process of nitric acid (HNO3), NO2 is produced as an intermediate material from ammonia (NH3).

Some N2O is generated in the process. The N2O abatement technology will be installed in the tail gas downstream after the HNO3 absorber and before the tail gas turbine. A tertiary catalyst reduces N2O that is formed in the primary ammonia oxidation reaction. A wide range of metals (e.g. Cu, Fe, Mn, Co and Ni) have been shown to be of varied efficiency in N2O abatement catalysts. The abatement efficiency of this pelleted catalyst has been shown to be up to 99.9% in the following reaction :

$$4\ N2O + CH4 \rightarrow 4\ N2 + 2\ H2O + CO2$$

In the tertiary abatement system N2O is removed by catalytic reduction with a hydrocarbon, such as natural gas.

The applied technology is chosen because it has negligible risk of decreasing HNO3 production and a high expected N2O reduction.

In addition NOx is reduced in a separate catalystbed by reduction with ammonia.

Technical Summary of the project

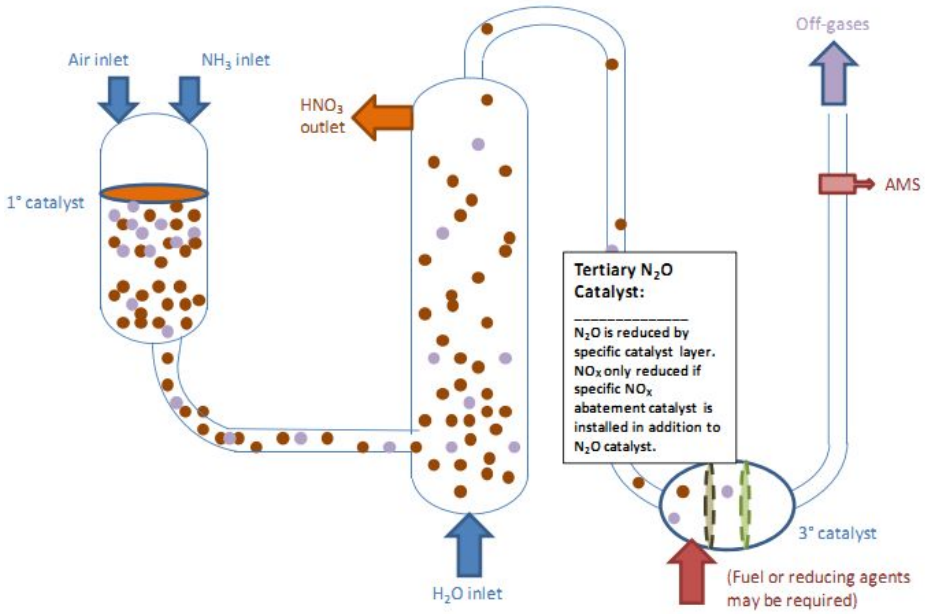

Figure 2: Image flow of tertiary catalyst unit

Project Constraints

Are there any constraints affecting project operations or commissioning? *(Brief description: 1 paragraph or less) Note: these may be due to energy supply, infrastructure, other resources etc.*

The project will be incorporated within the boundaries of the new proposed Nitric Acid Plant installation. This facility will require utilities for mainly, start up conditions. The plant is however equipped with its own power generation plant, but will require power for start-up conditions as well.

Technology to be employed	*Describe in less than 5 lines.* Tertiary N2O abatement catalyst installed in the tailgas of the nitric acid production plant. The proven technology "EnviNOx®" is supplied by Uhde GmbH, Germany. Is the technology one that has been previously tried and tested in South Africa or internationally? If yes, provide details (1 paragraph) The technology is successfully installed in several other nitric acid plants. Most of the installations are in other CDM projects under the approved methodology AM0028. Some installations are in Annex 1 countries as well. Have the project operators had any previous experience or expertise with operating the technology? If yes – provide brief details (1-2 lines) A similar project is existing at Omnias other nitric acid plant at the

<table>
<tr><th colspan="2">Technical Summary of the project</th></tr>
<tr><td></td><td>Sasolburg site. The project is registered as UNFCCC # 0752 and is under successful operation since February 2008.</td></tr>
<tr><td>Greenhouse Gases Targeted</td><td>Identify which greenhouse gas(es) this project will target.

N2O</td></tr>
<tr><td>Emission reductions</td><td>Indicate the expected emission reductions that will occur due to the project.

Note: please provide annual and total emission reductions in tonnes CO2 equivalent

<table>
<tr><th>Year</th><th>$EF_{default,y}$ (kgN_2O/ $tHNO_{3)}$</th><th>ER_n (tCO2e)</th></tr>
<tr><td>04/2012</td><td>3.90</td><td>171,544</td></tr>
<tr><td>2013</td><td>3.70</td><td>432,652</td></tr>
<tr><td>2014</td><td>3.50</td><td>407,852</td></tr>
<tr><td>2015</td><td>3.40</td><td>395,452</td></tr>
<tr><td>2016</td><td>3.20</td><td>370,652</td></tr>
<tr><td>2017</td><td>3.00</td><td>345,852</td></tr>
<tr><td>2018</td><td>2.80</td><td>321,052</td></tr>
<tr><td>2019</td><td>2.70</td><td>308,652</td></tr>
<tr><td>2020</td><td>2.50</td><td>283,852</td></tr>
<tr><td>2021</td><td>2.50</td><td>283,852</td></tr>
<tr><td>03/2022</td><td>2.50</td><td>70,963</td></tr>
<tr><td colspan="2">Total</td><td>3,392,375</td></tr>
<tr><td colspan="2">Annual Average over the crediting period</td><td>339,238</td></tr>
</table></td></tr>
<tr><td>Baseline & Additionality Assessment</td><td>Provide an indication of the baseline and additionality approach to be used, with a brief explanation of why the project is additional as defined under the Kyoto Protocol.

There are currently no national regulations in South Africa that limit N2O emissions from nitric acid production. This has been confirmed for the specific case of the Omnia nitric acid plant in a confirmation letter issued by Department of Environmental Affairs of the government of South Africa .
In the absence of regulations requiring the abatement of N2O emissions, the operator of the nitric acid plant has no economic incentives to take any N2O abatement measures because this entails capital and operating costs but no financial benefits.
Therefore, the CDM project activity is considered additional and the baseline scenario is that the N2O is emitted to the atmosphere with no N2O abatement measure being implemented.</td></tr>
</table>

Technical Summary of the project	
	According to the baseline methodology procedure of the methodology ACM0019 Version 1.0.0, the project activity is considered to be additional in the absence of regulations requiring the abatement of N2O emissions. The operator of the nitric acid plant has no economic incentives to take any N2O abatement measure because this entails capital and operation costs but no financial benefits. In the absence of any regulation, the baseline scenario is emitting N2O to the atmosphere with no N2O abatement measure being implemented.
Monitoring	*Describe the parameters that will be used as performance indicators that will be monitored to verify that emissions reductions are taking place.* *Note: parameters may include emissions output, energy production, energy sales, environmental impacts etc.* Throughout the crediting period of the project activity, the N2O concentration and volume or mass flow of the tail gas are to be monitored continuously. The monitoring system is to be installed and maintained throughout the crediting period based on the European Norm 14181 (2004), or any more recent update of that standard. In addition the nitric acid production output and the consumption of fossil fuel for the abatement unit are continuously monitored.
Type of project/activities	*Identify which type of activity is involved in this project – and for each, provide brief details*
a. Energy Supply	*Select if applicable: Renewable Energy (excluding biomass)/ Biomass/ Cogeneration/ Improving energy efficiency by replacing existing equipment/minimization of transport and distribution/ fuel switch/ other* *Provide details (1-2 lines)*
b. Energy Demand	*Select if applicable: Replacement of existing 'household equipment'/ improvement of energy efficiency of existing production equipment/ other* *Provide details (1-2 lines)* *Energy is required for the destruction of N2O, however the plant is capable of supplying the energy needed, and therefore no extra energy will be required.*
c. Industrial Process	*Provide details (1-2 lines)* N2O abatement by tertiary catalyst system in the tailgas of a nitric acid production plant
d. Transport	*Select if applicable: More efficient engines for transport/ modal shift/ fuel switch/ other* *Provide details (1-2 lines)*

Technical Summary of the project	
e. Waste Management	*Select if applicable: Capture of landfill methane emissions/ utilization of waste and waste water emissions/ other* *Provide details (1-2 lines)*
f. Forestry/ land use	*Provide details (1-2 lines)*
g. Other	*Provide details (1-2 lines)*
Project Boundary Define the Project Boundary (Approximately 1 paragraph) Note: a project boundary refers to all emissions which are under the control or directly affected by the project activity. Such a boundary can encompass equipment, processes and process flows. The spatial extent of the project boundary encompasses the facility and equipment for the nitric acid production process from the inlet of the ammonia burner to the outlet of the tail gas section. As the project activity introduces tertiary N2O abatement, any remaining N2O emissions from the project plant and CO2 emissions arising from the operation of the tertiary abatement system are included as project emissions in the project boundary. The boundary of the project will be from the inlet of the Ammonia Oxidation Reactor to the outlet of the stack of the nitric acid plant.	
Indicate Emissions outside the Project Boundary	*Note: Significant and measurable net emissions of GHG that are attributable to the project outside of the project boundary* Any leakage emissions sources are deemed to be negligible. No Emissions outside the project boundary occur

Location of the Project	
Province	Freestate
Municipality	Metsimaholo
Nearest city/large town	Sasolburg
Brief description of the location of the project site	*No more than 3-5 lines* Omnia's new CDM project is located at the south factory at the Sasolburg plant. The coordinates are latitude of approx. 26°48'48" South and a longitude of 27°51'23" East.

Project Schedule/Timetable	
Earliest Project Start Date	*Year/month* 2012/April
When is the expected first year of CER delivery	*Year*

Project Schedule/Timetable	
	2013
Project Lifetime	*No. Years* 10 Years min
Project End Date	*Year/month* 2022/ March
Crediting Period	*Has a crediting period for the project been identified?* *If yes – which option has been selected (10 years or X times 7 years, with reassessment of baseline for each 7 year renewal?* 10 Years
Current Status or phase of the project	*Select most applicable:* *Under discussion/ planning/preparation/construction or other actions already commenced/ Other (explain)* *Please provide brief details (1-2 lines)* The project is under construction, major parts of the equipment is already available on site. The start up of the project is expected for April 2012.
DNA Approval	*Has this project been submitted to the DNA for approval previously?* *If yes – provide date of last submission and brief details of the response from the DNA (1 paragraph)* The project has not been submitted to the DNA for approval previously. *Provide details of any other official response by the DNA regarding this project*
Approval by other bodies	*Has this project (or any elements of the project) been submitted to any other national, provincial or local government departments or agencies for regulatory or legal approval (excluding EIA process – see Part C). If so – provide brief details.* All the facilities will be built according to international and national specifications and all requirements of the National Water Act, the Occupational Health and Safety Act, the Air Quality Management Act and the National Environmental Management Act will be fully met.

Part C: Performance Against the DNA's Sustainable Development Criteria

South Africa has identified the following sustainable development criteria and indicators against which each CDM project will be assessed. Please provide your interpretation of how this project will address each of these **criteria and indicators** where they are relevant to the project. If the space provided is not sufficient please append additional information as required.

NOTE: For all indicators which are of relevance to the project show how the performance of the project against these indicators can be objectively monitored and measured on an ongoing basis.

1. Economic: Does the project contribute to national economic development?

Please give details (1 paragraph)

The technology will be introduced to the project, promoting the application of advanced emission reduction technology as well as advanced emissions monitoring technology in South Africa. This will also facilitate the trading of Certified Emission Reduction certificates to Annexure 1 countries.

2. Social: Does the project contribute to social development in South Africa?

Please give details (1 paragraph)

The implementation of the project activity includes the training course for operation of the total unit of a tertiary catalyst unit including guidance on accurate monitoring, which will provide the staff of Omnia Fertilizer with an opportunity to improve skills. The implementation of the project activity is likely to create local employment. Extra staff will be required for the operation of this facility.

3. Environmental: Does the project conform to the National Environmental Management Act principles of sustainable development?

Please provide **brief** comment for each of these below.

i) That the **disturbance of ecosystems and loss of biological diversity** are avoided, or where they cannot be avoided, are minimised and remedied	*(1 paragraph)* The project will have no impact on ecosystems. The project will reduce gaseous emissions of nitrous oxide (N2O) from the plant tail gas and will therefore contribute to international efforts to reduce greenhouse gas emissions. The project will have no negative effects on local air quality.
ii) That **pollution and degradation of the environment** are avoided, or where they cannot be altogether avoided, are minimised and remedied	*(1 paragraph)* The project will have no impact on water pollution. No additional water is required for the project activity's implementation or operation. Therefore, there is no impact on the sustainable use of water. The project will have no negative impact on the environment.
iii) That the **disturbance of landscapes and sites that constitute the nation's cultural heritage** is avoided, or where it cannot be altogether avoided, is minimised and remedied	*(1 paragraph*) The project will have no impact on landscapes or sites. No additional landuse is necessary.
iv) That **waste is avoided**, or where it cannot be altogether avoided, minimised and reused or recycled where	*(1 paragraph)* The project will produce no additional waste streams. In case the catalyst

possible and otherwise disposed of in a responsible manner	might have to be replaced, the used catalyst will be recycled or if not possible disposed of by the catalyst supplier in accordance with international standards.
v) That **the use and exploitation of non-renewable resources is responsible and equitable**, and takes into account the consequences of the depletion of the resource	*(1 paragraph)* For the operation of the abatement catalyst some hydrocarbon fuel like natural gas is necessary. The amount of fuel and the resulting CO2 emissions from the use of the fuel are insignificant compared to the amount of greenhouse gas emission reductions in the project.
vi) That the **development, use and exploitation of renewable resources is responsible and equitable**, and takes into account the consequences of the depletion of the resource.	*(1 paragraph)* The project will have no impact on renewable sources.
vii) That **a risk averse and cautious approach** is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions	*(1 paragraph)* The project applies a well proven technology that is used in numerous cases worldwide. The project proponent themselves are operating this technology in their other nitric acid plant successfully since 2008.
vii) That **negative impacts on the environment and on people's environmental rights** be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied	*(1 paragraph)* The project will have no negative impact on the environment. The project will reduce gaseous emissions of nitrous oxide (N2O) from the plant tail gas and will therefore contribute to international efforts to reduce greenhouse gas emissions. The project will have no negative effects on local air quality.
Other comments **Please provide any other comments on how this project contributes to sustainable development in South Africa (**optional) In summary the project will have positive impact on the environment. This facility will reduce greenhouse gas emission, creating jobs and deriving revenue for South Africa.	

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
Environmental	Impact on local environmental quality	• Impact of the project on air quality • Impact of the project on water pollution • Impact of the project on the generation or disposal of solid waste • Any other positive or negative environmental impacts of the project (such as impacts on noise, safety, visual impacts, or traffic)	Please comment on the impact of the project on local environmental quality. Comment specifically on the indicators of relevance which are given here. (1 paragraph) *The project will have no negative impact on the environment. The project will reduce gaseous emissions of nitrous oxide (N2O) from the plant tail gas and will therefore contribute to international efforts to reduce greenhouse gas emissions. The project will have no negative effects on local air quality. The project will have no impact on water pollution. No additional water is required for the project activity's implementation or operation. Therefore, there is no impact on the sustainable use of water. The project will produce no additional waste streams. In case the catalyst might have to be replaced, the used catalyst will be recycled or if not possible disposed of by the catalyst supplier in accordance with international standards*
	Change in usage of natural resources	• Impact of the project on community access to natural resources • Impact of the project on the sustainability of use of water, minerals or other non renewable natural resources • Impact of the project on the efficiency of resource utilisation	Please comment on the impact of the project on the usage of natural resources. Comment specifically on the indicators of relevance which are given here. (1 paragraph) *The project has no impacts on the usage of natural resources.*
	Impacts on biodiversity and ecosystems	• Changes in local or regional biodiversity arising from the project	Please comment on the impact of the project on biodiversity and ecosystems. Comment specifically on the indicators of relevance which are given here. (1 paragraph) *The project has no impacts on biodiversity or ecosystems.*

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
Economic	Economic impacts	• Impact of the project on foreign exchange requirements • Impact of the project on existing economic activity in the area • Impact of the project on the cost of energy • Impact of the project on foreign direct investment	The project will have a positive contribution to FDI through the sale of CERs to Annex 1 countries (Western Europe, Canada, Japan, etc.) generated by the project. This revenue, part of which will be used in the community, will lead to the creation of jobs through its spin off effect. This is due to the fact that Omnia will either invest profit it makes from this project or pay it out in dividends to its shareholders, they will in turn spend some, if not all of the extra cash, thereby growing the economy and creating jobs Omnia will contribute from the sale of CERs on agricultural related projects in consultation with and for the agricultural community. These projects will be focused on education, poverty reduction and job creation. The exact projects will be decided in consultation with the relevant stakeholders.
	Appropriate technology transfer	• Positive or negative implications for the transfer of technology to South Africa arising from the project • Impacts of the project on local skills development • Demonstration and replication potential of the project	Please comment on the impacts of the project on appropriate technology transfer. Comment specifically on the indicators of relevance which are given here. (1 paragraph) *The technology will be introduced to the project, promoting the application of advanced emission reduction technology in South Africa. The implementation of the project activity includes the training course for operation of the total unit of a tertiary catalyst unit including guidance on accurate monitoring, which will provide the staffs of Omnia Fertilizer with an opportunity to improve skills. The implementation of the project activity is likely to create local employment.*

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
Social	Alignment with national provincial and local development priorities	• How the project is aligned with provincial and national government objectives • How the project is aligned with local developmental objectives • Impact of the project on the provision of, or access to, basic services to the area • Impact of the project on the relocation of communities if applicable • Contribution of the project to a any specific sectoral objectives (for example, renewable energy targets)	The alignment of this project would be in line with the priorities stipulated at all levels of government. The Air Quality will be improved, despite the installation of a new facility in the Sasolburg area. The creation of jobs for the installation and operation of these units will also be achieved.
	Social equity and poverty alleviation	• Impact of the project on employment levels? (specify the number of jobs created/lost; the duration of time employed, distribution of employment opportunities, types of employment, categories of employment changes in terms of skill levels and gender and racial equity) • Impact of the project on community social structures • Impact of the project on social heritage • Impact of the project on the provision of social amenities to the community in which the project is situated • Contribution of the project to the development of previously underdeveloped areas or specially designated development nodes	The installation of the facility, will also be in line with the growth of the organisation in the area. This has a knock on effect for the development of community as well as creation of jobs in the area for the installation and operation of this unit. Over 200 people will be employed during the erection Phase. Approximately 10 direct staff and a significant amount as indirect staff will be employed as a result of these facilities.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
General	General Project Acceptability	• Are the distribution of project benefits deemed to be reasonable and fair?	The distribution of project is deemed to be reasonable and fair, due the technology adopted and the contribution to the reduction of greenhouse gas emission in South Africa. - It will contribute to the sustainable development objectives of South Africa in accordance with the National Environmental Management Act No. 107 of 1998.

Part D: Finance

Project Costs	
Development Costs (R's)	The information on project costs and finance is confidential but can be made available upon request to individuals at the DNA, if so required for the final LoA assessment.
Installed Costs (R's)	
Other Costs (R's)	
Total Project Costs (R's)	
Sources of Finance	
Equity	*Name of Organisation(s) and amount (R's) contributed by each*
Debt (long term)	*Name of organization(s) and amount (R's) for each*
Debt (short term)	N*ame of organization(s) and amount (R's) for each*
Amount not identified (R's)	*Amount (R's) and a brief summary of the needs and any outstanding issues* *(1 paragraph or less)*
Total CDM Contribution sought	*Amount (R's) and a brief summary of the needs and any outstanding issues* *(1 paragraph or less)*
Expected Price of CER in case of a contract to purchase for: A period of 7 years A period of 10 years A period of 14 years (2x7 years)	 *Price? (R's)* *Price? (R's)* *Price? (R's)*
Indicate the **projected Internal Rate of Return** for the project with and without CER revenues.	*Note: Please indicate assumed price of CER as used in your calculation*
Constraints on tradability of carbon credits	*Have any commercial arrangements been made that may impact the tradability of the carbon emission reductions? If yes, please define.Note. Examples would be subjection to a mortgage, government tax etc.*
Preliminary discussions with potential purchasers	*Have you had any preliminary discussions with any potential purchasers of the carbon credits (CERs)* *If yes, please give brief details.*