

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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The sole purpose of the proposed project activity is to significantly reduce current levels of N₂O emissions from the production of nitric acid at one of AEL's nitric acid plants (the "No. 11 Plant") at Modderfontein, South Africa. The No. 11 nitric acid plant was designed by Uhde and commissioned in 1979, it is a single burner dual pressure oxidation plant operated at 4.5 bar gauge.

AEL is the principal developer, producer and supplier of commercial explosives, initiating systems and blasting services for all mining, quarrying and construction markets in Africa.

Established in 1896, AEL is one of the world's leading suppliers of explosives and initiating systems. The nitric acid produced by AEL is mainly utilized by AEL's own Ammonium Nitrate ("AN") production plant which produces both porous prilled AN and dense prilled AN for commercial explosives manufacturing, mainly for mining purposes. In addition, some AN is supplied as an aqueous solution to local fertiliser manufacturers in South Africa.

To produce nitric acid, ammonia (NH₃) is reacted with air over precious metal – normally a platinum-rhodium (Pt-Rh) alloy – catalyst gauze pack in the ammonia oxidation reactor of nitric acid plants. The main product of this reaction is NO, which is metastable at the conditions present in the ammonia oxidation reactor and therefore reacts with the available oxygen to form NO₂, which is later absorbed in water to form HNO₃ – nitric acid. Simultaneously, undesired side reactions yield nitrous oxide (N₂O), nitrogen and water. N₂O is a potent greenhouse gas with a Global Warming Potential (GWP) of 310¹.

The project activity involves the installation of a new N₂O abatement technology; a pelletised catalyst that will be installed inside the ammonia oxidation reactor, underneath the precious metal gauzes. It is expected that this catalyst will reduce between 80% and 95% of current N₂O emissions.

The project transfers a new, clean technology to South Africa that is not even common industrial practice in Annex 1 countries. Also, the project will lead to an enhancement of skills as employees will be trained to operate both the N₂O abatement catalyst and the Automated Monitoring System.

AEL is an ISO 9001 and 14001 certified company. The procedures for monitoring, regular calibrations and QA/QC are fully embedded into the procedures required by ISO 9001/14001 and documented in the applicable ISO handbooks.

The financial benefits from the sale of Certified Emission Reductions ("CERs") will be used to offset the capital and operating costs of the project to provide for its continued operation throughout the crediting period.

Through the sale of CERs, AEL will also be able to improve its profitability and ensure employment, contribute to economic prosperity in the region as well as invest in further clean technologies to improve its environmental performance.

AEL's shares are owned by AECL and Tiso (a "black empowerment" investment company). A share of AEL's CDM profits will go to the Tiso-AEL Community Development Trust which benefits two local communities near Modderfontein: Alexandra and Tembisa; especially an Environmental Education Project (EEP) aimed at local schoolchildren². The EEP will improve social structures and social amenities in the community.

Furthermore, the project activity may well stimulate the implementation of further CDM projects in South Africa. Compared to tertiary catalyst technology, which requires additional natural gas for its

¹ IPCC Second Assessment Report (1995)

² See Annex 5 for more detailed information on the Environmental Education Project.

operation, the implementation of secondary catalyst technology also indirectly contributes to the South African Government's Energy Efficiency Strategy³.

In these aspects, the project will contribute to the sustainable development objectives of South Africa in accordance with the National Environmental Management Act No. 107 of 1998. The project has already received Letters of Endorsement from the Ministry of Minerals and Energy in South Africa and the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. A letter of Approval from the South African government is only obtainable once the project has been validated⁴.

A.2. Location of project activity

A.2.1. Host Party

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South Africa

A.2.2. Region/State/Province etc.

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Province of Gauteng, South Africa

A.2.3. City/Town/Community etc.

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Modderfontein, east of the City of Johannesburg

A.2.4. Physical/Geographical location

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AEL operates an industrial complex at Modderfontein, approximately 20 km north-east from the centre of the City of Johannesburg. The postal address is PO Modderfontein 1645. This PDD covers the larger of the two nitric acid plants – named No. 11 – operated at this location. The exact longitude and latitude of the plant's location is 26° 05' 50" South and 28° 10' 26" East⁵.

A regional map shows the location of Modderfontein near Johannesburg

³ See <http://www.dme.gov.za/energy/efficiency.stm>

⁴ See http://www.dme.gov.za/dna/dna_approvalprocess.stm under "mandatory submission".

⁵ Coordinates according to Google Earth®, version 4.0.291 (beta)