



**MINISTRY: ENVIRONMENTAL AFFAIRS AND TOURISM
REPUBLIC OF SOUTH AFRICA**

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Mr Reuel Khoza
Chairman
ESKOM
P O Box 1091
JOHANNESBURG
2000

13 December 2002

Fax: (011) 800 4522

Dear Mr Khoza

APPLICATION FOR AUTHORISATION: THE CONSTRUCTION OF THE BRAAMHOEK PUMPED STORAGE SCHEME

Your application for authorisation, in terms of section 22 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) in respect of an activity identified in terms of section 21 of the Act, regarding the above matter refers.

I have evaluated all the relevant information made available to me and have decided to authorise the construction of the Braamhoek Pumped Storage Scheme, subject to the conditions listed in the record of decision. (Schedule 1 of Government Notice No. R. 1182: Item 1(a) (facilities for commercial electricity generation and supply).

Enclosed please find the record of decision and the conditions under which your application is authorised.

M V MOGSA
MINISTER OF ENVIRONMENTAL AFFAIRS AND TOURISM
DATIE:

cc: Poltech Consultants, Mr Willem Lombaard;
HOD Department of Tourism, Environmental and Economic Affairs, Free State;
HOD Department of Agriculture and Environmental Affairs, KZN;
Dr D Kotze, Appellant

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RECORD OF DECISION

DECISION IN TERMS OF SECTION 36 (2) OF THE ENVIRONMENT CONSERVATION ACT, 1989 WITH REGARD TO THE UNDERTAKING OF THE ACTIVITY DESCRIBED BELOW AS REQUIRED BY GOVERNMENT NOTICE NO. R. 1183 OF 5 SEPTEMBER 1997.

1. REFERENCE NUMBER: A24/16/3/124

2. BRIEF DESCRIPTION OF ACTIVITY

The applicant proposes the construction of a pumped storage scheme that will consist of two dams, an upper dam on the escarpment and a lower dam below the escarpment. Both dams will be interconnected by an enclosed tunnel system fitted with pump turbine units for the production of approximately 1000MW of electricity. This scheme will utilize surplus electricity generated by Eskom during off-peak hours to pump water from the lower dam to the upper dam where the water will be stored. This water will be released during peak load hours from the top dam to the lower dam to generate electricity to supplement the peak demand.

3. LOCALITY

Province: Border of Free State and Kwa-Zulu Natal
Magisterial District: uThukela Regional District
1:50 000 map: 3325 BC Coerney
Location: The upper dam will be located in a tributary of the upper reaches of the Wilge River system in the Free State on the farms Bedford 389, Bedford 2-845 and Braambosch 14497 at 28° 15' S & 29° 35' E. The lower dam will be situated on the Braamhoekspruit, a tributary of the Klip River in Kwazulu-Natal on the farm Braamhoek 1220 at 28° 19' S & 29° 35' E.

4. APPLICANT

The Environmental Manager
Eskom Generation Division
PO Box 1091
JOHANNESBURG
2000

Contact Person: Mr Tony Stott
Tel: (011) 800-2004
Fax: (011) 800-2826

5. CONSULTANT

Poltech (Pty) Ltd
PO Box 7211
CENTURION
0046

Contact Person: Mr Willem Lombard
Tel: (012) 663 7007
Fax: (011) 663 8429

6. DECISION

Authorisation is granted in terms of section 22(3) of the Environment Conservation Act, 1989 (Act No. 73 of 1989) for the construction of the Braamhoek Pumped Storage Scheme (Schedule 1 of Government Notice No. R. 1182: Item 1 (a) (facilities for commercial electricity generation and supply, and Item 1 (j) dams, levees or weirs affecting the flow of the river).

This authorisation is granted subject to the following conditions:

6.1 General

- 6.1.1 This authorisation is granted only in terms of section 22 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) and does not exempt the holder thereof from compliance with any other legislation.
- 6.1.2 This authorisation refers only to the activity as specified and described above. Any other activity listed under section 21 of the Environment Conservation Act, 1989 (No. 73 of 1989) which is not specified above, is not covered by this authorisation, and must therefore comply with the requirements of the Act, Government Notice R. 1183 and its amendments.
- 6.1.3 The authorisation is subject to the approval of the affected local authorities in terms of any legislation administered by those authorities.
- 6.1.4 One week's notice, in writing, must be given to the Department of Environmental Affairs and Tourism before commencement of construction activities. Such notice shall make clear reference to the site location details and reference number given above.
- 6.1.5 The conditions of this authorisation must be brought to the attention of all persons (employees, sub-consultants, contractors etc.) associated with the undertaking of this activity and the applicant must take such measures necessary to bind such persons to these conditions. The applicant must carry out regular environmental audits to establish compliance with the conditions of this authorisation. In the event of non-compliance the applicant should institute a penalty.
- 6.1.6 The applicant must, within 5 calendar days of receipt of this record of decision inform all interested and affected parties registered during the EIA process of the outcome of this application and, if requested, provide copies of this record of decision, including all the conditions attached thereto.
- 6.1.7 The applicant must notify the Department of Environmental Affairs and Tourism, in writing, within 24 hours thereof if any condition of the authorisation is not complied with.
- 6.1.8 A copy of the authorisation shall be available on site during construction and all staff, contractors and sub-contractors shall be familiar with or be made aware of the contents of this authorisation.
- 6.1.9 Records relating to the compliance and non-compliance with the conditions of the authorisation must be kept in good order. Such records shall be made available to the Department of Environmental Affairs and Tourism within seven days of receipt of a written request by the department for such records.

- 6.1.10 Changes in the project resulting in significant environmental impacts are only permissible if approved in writing by the Department of Environmental Affairs and Tourism.
- 6.1.11 The Department of Environmental Affairs and Tourism may add to, change and/or amend any of the conditions in this authorisation if, in the opinion of the department, the addition, change or amendment is environmentally justified.
- 6.1.12 The Department of Environmental Affairs and Tourism must be notified, within 30 days thereof, of any change of ownership and /or project developer. Conditions imposed in this record of decision must be made known to the new owner and/or developer and are binding on the new owner and/or developer.
- 6.1.13 The Department of Environmental Affairs and Tourism must be notified of any change of address of the applicant.
- 6.1.14 National government, provincial government, local authorities or committees appointed in terms of the conditions of this application or any other public authority or organisation shall not be held responsible for any damages or losses suffered by the applicant or his successor in title in any instance where construction or operation subsequent to construction be temporarily or permanently stopped for reasons of non-compliance by the applicant with the conditions of approval as set out in this document or any other subsequent document emanating from these conditions of approval.
- 6.1.15 If any condition imposed in terms of this authorisation is not being complied with, the authorisation may be withdrawn after 30 days written notice to the applicant in terms of section 22(4).
- 6.1.16 Failure to comply with any of these conditions shall also be regarded as an offence and may be dealt with in terms of sections 29, 30 and 31 of the Environment Conservation Act, 1989 (Act No. 73 of 1989), as well as any other appropriate legal mechanisms.
- 6.1.17 The applicant shall be responsible for all costs necessary to comply with the above conditions unless otherwise specified.
- 6.1.18 Any complaint from the public during the construction of the facilities must be attended to as soon as possible to the satisfaction of the parties concerned. A complaint register must be kept up to date and shall be produced upon request.
- 6.1.19 The authorisation only refers to the Braamhoek Pumped Storage Scheme. Separate applications must be lodged for any other development and/or activity, which is covered under section 21 and 22 of the Environmental Conservation Act, 1989 and Government Notice R 1182 and 1183 of 5 September 1997.
- 6.1.20 The construction of ancillary infrastructure such as roads and power lines are not included in this authorisation and a formal application must be lodged for such activities.
- 6.2 Project specific conditions**
- 6.2.1 The mitigation measures for this activity and the recommendations contained in the reports of Dr M Mentis and Prof T C Partridge, dated August and October 2002 respectively, must be implemented.
- 6.2.2 Environmental management plans (EMPs) for the construction and operation of all phases of the proposed development must be compiled and submitted to this department as well as the relevant provincial environmental departments for approval. The EMP may be altered, where monitoring and

auditing of the construction and operation of the units show this to be beneficial. Any alterations to the EMP shall be subject to approval by the Department of Environmental Affairs and Tourism.

- 6.2.3 Eskom shall purchase the farms Wilge Rivier 319, Bedford 389 and Chatsworth 388 as per recommendation in the specialist report revision 6 of October 2002, drafted for Eskom by Dr Mike Mentis, pg 44. This area will then be known as Bedford Wetland Park (BWP). This area shall be managed by Eskom in close cooperation with the relevant provincial departments.
- 6.2.4 If Eskom decides not to implement the proposed by-pass system, Eskom shall ensure that the virgin flow and the exact volumes and seasonal timing of base and flood flows are maintained. This aspect must be dealt with in detail in the construction and operational EMP for the proposed scheme.
- 6.2.5 Eskom shall provide and implement detailed measures in the construction and operational EMP to prevent concentrated delivery of runoff and stream flow into portion B of the wetland.
- 6.2.6 Eskom shall rehabilitate wetlands on the BWP to the extent determined through research and experience. This must be done in close cooperation with the relevant provincial department. This rehabilitation shall include rehabilitation of sheet and gully erosion.
- 6.2.7 These mitigation measures, recommendations and EMP shall be a legally binding component of any contract and should therefore be legally enforceable.
- 6.2.8 An environmental manager/control officer must be appointed to ensure that the conditions stipulated in this record of decision (ROD) are implemented. The name and contact details of such a manager/officer must be announced and forwarded to the Department of Environmental Affairs and Tourism before construction commences.
- 6.2.9 A monitoring and auditing program must be implemented to assess compliance with the conditions stipulated in this ROD. The results of the monitoring and auditing must be made available to the Department of Environmental Affairs and Tourism on a quarterly basis.
- 6.2.2 Prior to physical construction, the detail EMPs referred to above, which shall be living documents, must be submitted to the Department of Environmental Affairs and Tourism and the relevant provincial environmental authorities for approval.
- 6.2.3 The contents of the approved EMPs must be made known to personnel, contractors and sub-contractors associated with the project.
- 6.2.4 Procedures for implementing the approved EMP must be developed for solid waste disposal, water provision and storage thereof.
- 6.2.5 If changes are being made on the proposed project at a later stage during the construction period, the Department of Environmental Affairs and Tourism and the relevant environmental provincial department shall be notified of such changes. Such changes must be approved by the Department of Environmental Affairs and Tourism in cooperation with the relevant provincial department.
- 6.2.6 All removal of vegetation during construction must be done in consultation with the provincial environmental authorities, and appropriate post-construction rehabilitation measures shall be implemented in cooperation with the provincial environmental authorities.

- 6.2.7 Eskom shall, with the help of a suitably qualified landscape architect, investigate and design suitable sites to establish artificial cliffs for the colony of Bald Ibis to roost and nest. The extent of the artificial cliffs to be established, must replace the cliffs that will be lost due to flooding.
- 6.2.8 There shall be no negative impact on the downstream wetland as a result of the construction and operation of the proposed top dam. Eskom, in close cooperation with the Department of Water Affairs and Forestry, shall prescribe mitigation measures in the EMPs to ensure that the water flow regime remains similar to pre-construction conditions. These measures shall be implemented by Eskom.
- 6.2.9 Eskom must maintain the hydrological system downstream by releasing water at a rate, quantity and quality as closely as possible to the pre-construction flow.
- 6.2.10 Eskom must ensure that the upper dam is designed to maintain the pre-construction flow regime with among other things the volume and seasonal timing of base and flood flows. This must be done in close cooperation with the department of Water Affairs and Forestry.
- 6.2.11 Eskom must ensure that the upper dam is designed to preserve the quasi-equilibrium of the landscape geomorphics by ensuring that amongst other things:
- Measures are put in place to ensure that the base to which erosion is working does not change.
 - Measures are put in place to avoid concentrated flow inputs into the wetland.
- 6.2.12 The quarry on site must be below the dead volume of the dam to minimize the visual impacts once the top dam has been completed.
- 6.2.13 Existing borrow pits, if any, must be used to obtain filling material and necessary permits must be obtained from the Department of Minerals and Energy.
- 6.2.14 Quarries for the construction material used to construct the upper dam wall must be developed below the minimum water level, that is, within the dead storage volume of the top dam.
- 6.2.15 Waste material from excavations must be used as construction fill material or be disposed of below the minimum water level of the two dams, that is, in the dead storage of the volumes of both dams.
- 6.2.16 Eskom must ensure that sufficient measures are specified in the construction EPM to ensure that the virgin flow be maintained at all times during the construction phase.
- 6.2.17 The design of the dam wall must blend in with the natural surroundings to maintain the 'sense of place'. Materials used and the coloring of the dam wall must match the surrounding natural area. The loose boulders in the area of the proposed dam wall must be placed strategically on and around the dam wall to ensure that the dam wall will blend in with the natural surroundings. Eskom must obtain the services of a suitably qualified landscape architect in this regard.
- 6.2.18 The dam wall must be designed to prevent over flow from the upper reservoir during high rainfall season. Mitigation measures must be specified in the EMPs with regard to the prevention of the mixing of species in the upper and the lower reservoir and the maintenance of the water quality of the two reservoirs.
- 6.2.19 A separate environmental management plan (EMP) must be developed by Eskom and approved by the Department of Environmental Affairs and Tourism to mitigate the impact associated with

geotechnical exploratory work (such as the construction of an exploratory tunnel and on and off site core drilling) before this part of the construction work commences.

- 6.2.20 A low weir must be constructed downstream of the dam wall to allow uniform releases into the wetland.
- 6.2.21 The developer must ensure that no stoppage of water flow into the wetland downstream of the upper dam shall occur at any time before, during or after the construction of the dam.
- 6.2.22 Mitigation measures regarding disturbance of the avifauna in the wetland downstream of the upper dam must be included in the detailed EMP. The following aspects, which may lead to disturbance must be considered:
- Noise
 - Vibration
 - Dust
 - Changes in water quality
 - Illumination of the construction site and project structures.
 - Movement of vehicles and personnel.
- 6.2.23 Detailed studies and recording of the status of the wetland downstream of the upper dam must be carried out to compile the following:
- A baseline before construction. To be developed and submitted during the final design stage before any construction starts.
 - Status during construction. To be developed and submitted during construction on a quarterly basis.
 - Status during operation. To form part of the Operational Environmental Management plan and to be submitted on a quarterly basis.
- 6.2.24 Mitigation measures must be included in the EMP to reduce the environmental impacts during construction, especially on the wetland downstream of the upper dam. These measures will include, among others, the possibility to commence construction during winter, smaller blasts, and low pressure blasting, if necessary.
- 6.2.25 Construction workers must be alerted to the possible occurrence of Red Data species. If any species are encountered during construction, the Department of Nature Conservation for the specific Province must be approached for advice on how to handle the situation.
- 6.2.26 A detailed survey must be carried out of the cave in the upper dam basin.
- 6.2.27 Unmarked graves found during construction must be marked and fenced. Where necessary, legal reburials must be done.
- 6.2.28 The stipulations in the National Heritage Act, 1999 (Act 25 of 1999) must be adhered to with regard to the cave and graves.
- 6.2.29 Botanical gardens and similar institutions must be offered the opportunity to collect and relocate indigenous plants that occur on the sites to be affected, before construction begins.

- 6.2.30 Mitigation measures must be included in the detailed EMP to address the socio-economic impacts associated with the possibility of the development of the three major projects (de Beers Pass, Thukela Water Project and the Braamhoek Pumped Storage Scheme) occurring simultaneously.
- 6.2.31 The Braamhoek scheme shall be designed solely for the purpose of generating peak time electricity. No incorporation of an inter-basin water transfer project, which will impact on the downstream wetland, shall be allowed. Should this scheme at any time in the future forms part of an inter-basin water transfer project, a new application in terms of the relevant act must be lodged.
- 6.2.32 The peat section that will be affected during construction must be sampled for a study of the palaeo-environment.
- 6.2.33 Eskom must set up a research program to investigate all possible unmitigated effects of the scheme on the wetland. This research must also include elements of the functioning of the wetland and the interaction with all the wetland biota including the avifauna as recommended by Dr M Mentis.
- 6.2.34 Since the EMPs for the proposed scheme are dynamic documents and open for the principle of continual improvement, the results of this investigation and research must be included in the EMPs for the construction and operation of the scheme. The value of the research program should not be less than R 500 000 each year for ten years as recommended by Dr M Mentis.
- 6.2.35 Clear indication must be provided to the Department of Environmental Affairs and Tourism and to the relevant provincial departments on a quarterly basis that the findings were incorporated in the EMP.
- 6.2.36 The success or failure of the mitigation measures must also be reported to the Department of Environmental Affairs and Tourism and the provincial departments on a quarterly basis.
- 6.2.37 Construction may not commence without the Department of Environmental Affairs and Tourism receiving and approving the following:
- Final development framework and detailed site development plan.
 - A comprehensive Environmental Impact Assessment for all access roads and powerlines that connects the scheme to the national transmission grid.

7. RECOMMENDATIONS

- 7.1.1 It is recommended that an environmental management system (EMS) be compiled and implemented for the project. The EMS should incorporate the conditions of approval given in this ROD. This will facilitate monitoring and auditing. Such an EMS could assist in continual improvement on environmental issues related to the proposed project.
- 7.1.2 Eskom should further explore the opportunity of forming partnerships with non-governmental organisations to ensure a sustainable environment for the avifauna and flora on site and in the wetland downstream of the upper dam.

8. KEY FACTORS AFFECTING THE DECISION

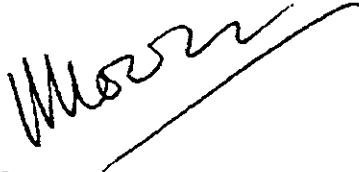
- 8.1 The idea of pumped storage schemes is supported. During off peak hours there is surplus energy in the grid. Normally, the surplus energy will be lost. A pumped storage scheme utilises the surplus energy to pump water up to the top reservoir of the pumped storage scheme. During peak hours, when there is a shortage of energy in the grid, the water from the top reservoir is released through a hydro-electric generator to generate extra energy to supplement the shortage in the grid during the peak hours.
- 8.2 The Braamhoek Pumped Storage Scheme of R 1,4 billion represents the sustainable development of a clean and renewable source of energy for South Africa.
- 8.3 The momentum of the electrification program in the country continues to increase. A pumped storage scheme could provide the long-term energy security for the peak load capacity.
- 8.4 Currently, most of the base load of energy is generated from coal-fired power stations with the associated coal mining problems and air pollution problems especially on the Highveld. Pumped storage schemes can contribute towards reducing some of these impacts.
- 8.5 Pumped storage schemes are crucial for the energy strategy of the country and contributes further towards the diversification of the country's energy base mix.
- 8.6 The negative impacts of a pumped storage scheme can be mitigated and managed in order to minimise it.
- 8.7 The proposed partnerships between Eskom and specific conservation bodies in the area could ensure the sustainable management of the Bedford-Chatsworth wetland to provide a habitat for threatened species and at the same time provide the benefit of efficient energy supply.

9. SITE VISIT

Mr WDM Fourie	DEAT
Mr DWJ Smith	DEAT
Mr P Ngoasheng	DEAT
Ms M Moloto	DEAT
Mr H Thornhill	KZN DEAT
Mr N Collins	FS DEAT
Mr K Rabie	ESKOM
Mr F Louwinger	ESKOM
Mr W Lombaard Poltech	

10. DURATION AND DATE OF EXPIRY

If construction does not commence within a period of (5) five years, this authorisation will be invalidated.



MV MOOSA
MINISTER OF ENVIRONMENTAL AFFAIRS AND TOURISM
DATE:

13/12/02

