



**APPLICATION FOR AUTHORISATION  
AND  
BASIC ASSESSMENT REPORT**

**FOR THE**

**PROPOSED CONSTRUCTION OF A MINI HYDRO  
POWER PLANT ON THE FARM BOTTERKLOOF 541  
CLARENS DISTRICT, SOUTH AFRICA**

**FREE STATE PROVINCE  
EMB/1(k)1(m) 4/07/93**

**MARCH 2009**

**Submitted to:**

Free State Department of Tourism,  
Environmental and Economic Affairs

**Prepared by:**

NinhamShand (Pty) Ltd



## REPORT DETAILS

### FREE STATE DTEEA

**REFERENCE NUMBER.** : EMB/1(k)1(m) 4/07/93

**TITLE** : Basic Assessment Report for the proposed construction of a mini Hydro Power Plant on the farm Botterkloof 541 – Clarens District, South Africa.

**PROJECT NAME** : Construction of Botterkloof mini Hydro Power Plant.

**AUTHOR(S)** : Willem Howell  
Roshantha Kolapen  
Natanya Whitehom  
Barend Smit

**CLIENT** : NuPlanet (Pty) Ltd

**CONSULTANT** : Ninham Shand Consulting Services  
Private Bag X136  
CENTURION  
0046  
Tel: (012) 643-9000  
Fax: (012) 663-3257  
E-mail: enviro@shands.co.za


**NINHAM SHAND**

**REPORT NUMBER** : 4635/401944

**REPORT STATUS** : Final

**DATE OF SUBMISSION** : March 2009

  
\_\_\_\_\_  
B.H.J. Smit Pr L Arch, Director  
Project Director

  
\_\_\_\_\_  
W Howell  
Project Manager

*This report is to be referred to in bibliographies as: Ninham Shand. 2009: Basic Assessment Report for the proposed construction of a mini Hydro Power Plant on the farm Botterkloof 541 – Clarens District, South Africa.*

## **Application for Authorisation**

# APPLICATION FORM



## FREE STATE PROVINCE



	(For official use only)						
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Application Number:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; height: 20px;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> </table>						
Date Received:	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 100%; height: 20px;"></td> </tr> </table>						

Application for authorisation for the undertaking of a scheduled activity or activities set out in Regulations R. 386, R. 387 in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998)

**Kindly note that:**

1. This application form is current as of 3 July 2006. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.
2. The application must be typed within the spaces provided in the form, or be completed in legible handwriting. Unclear or illegible applications will be returned to the applicant. The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided. It is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable **black out** the boxes that are not applicable in the form.
4. Incomplete applications may be returned to the applicant for revision.
5. The use of "not applicable" in the form must be done with circumspection as if it is used in respect of material information that is required by the competent authority for assessing the application, and may result in the rejection of the application as provided for in the regulations.
6. This application must be handed in at the offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed applications will be accepted.
8. The application must be completed by an independent environmental practitioner.
9. Unless protected by law, all information filled in on this application will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this application on request, during any stage of the application process.

**SITE IDENTIFICATION AND LINKAGE**

Please indicate all the Surveyor-general 21 digit site (erf/farm/portion) reference numbers for all sites (including portions of sites) that are part of the application.

F	0	0	1	0	0	0	0	0	0	0	0	0	0	5	4	1	0	0	0	0	0
F	0	0	1	0	0	0	0	0	0	0	0	0	0	5	4	1	0	0	0	0	1
F	0	0	1	0	0	0	0	0	0	0	0	0	0	5	4	1	0	0	0	0	2

(if there are more than 10, please attach a list with the rest of the number) (These numbers will be used to link various different applications, authorisations, permits etc. that may be connected to a specific site)



# APPLICATION FORM

## 1. BACKGROUND INFORMATION

<b>Project applicant:</b>	NuPlanet (Pty) Ltd		
<b>Trading name (if any):</b>	N/A		
<b>Contact person:</b>	Anton-Louis Olivier		
<b>Physical address:</b>	REAM House, 53 De Havilland Crescent, Persequor Park, Pretoria, 0020.		
<b>Postal address:</b>	P.O. Box 35630, Menlopark, Pretoria.		
<b>Postal code:</b>	0102	<b>Cell:</b>	Not Available
<b>Telephone:</b>	+27 (0)12 349 2944	<b>Fax:</b>	+27(0)88 012 349 2944
<b>E-mail:</b>	al@nuplanet.nl		

<b>Project consultant:</b>	Ninham Shand (Pty) Ltd		
<b>Contact person:</b>	BHJ Smit		
<b>Postal address:</b>	Private Bag X136, Centurion, Pretoria.		
<b>Postal code:</b>	0046	<b>Cell:</b>	083 540 3661
<b>Telephone:</b>	+27 (0)12 643 9000	<b>Fax:</b>	+27 (0)12 663 3257
<b>E-mail:</b>	Barend.smit@shands.co.za		
<b>Professional affiliation(s) (if any)</b>	<ul style="list-style-type: none"> <li>• Registered Professional Landscape Architect (Registration Number: 99096) with South African Council for the Landscape Architectural Profession.</li> <li>• Member and Former President of the South African Institute of Landscape Architects.</li> <li>• Member of the Gauteng Society of Landscape Architects.</li> <li>• Member of the International Federation of Landscape Architects.</li> <li>• Member of the South African affiliate of the International Association for Impact Assessment.</li> </ul>		

<b>Landowner:</b>	Paul Johannes Farrell		
<b>Contact person:</b>	Paul Johannes Farrel		
<b>Postal address:</b>	P.O. Box 222, Bethlehem.		
<b>Postal code:</b>	9700	<b>Cell:</b>	Not Available
<b>Telephone:</b>	+27 (0)58 256 1131	<b>Fax:</b>	+27 (0)58 256 1372
<b>E-mail:</b>	Farrell@isat.co.za		

*In instances where there is more than one landowner, please attach a list of landowners with their contact details to this application.*

<b>Local authority in whose jurisdiction the proposed activity will fall:</b>	Dihlabeng Municipality		
<b>Contact person:</b>	Clr (Ms) M Mashinini		
<b>Postal address:</b>	286 Kgubetswana, Clarens.		
<b>Postal code:</b>	9707	<b>Cell:</b>	+27 (0)82 826 0537
<b>Telephone:</b>	+27 (0)58 256 1507	<b>Fax:</b>	+27 (0)58 256 1380
<b>E-mail:</b>	Not available		

*In instances where there is more than one local authority involved, please attach a list of local authorities with their contact details to this application.*

<b>Project title:</b>	Construction of Botterkloof mini Hydro Power Plant.
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<b>Property description:</b>	Botterkloof 541 (Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.
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<b>Town(s) or district(s):</b>	Clarens
<b>Physical address:</b>	N/A

*In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.*

<b>Current land-use zoning:</b>	Agricultural
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*In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.*

<b>Is a change of land-use or a consent use application required?</b>	YES	NO	
<b>Must a building plan be submitted to the local authority?</b>	YES	NO	

<b>Locality map:</b>	<p>A locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be at least 1:50 000. The scale must be indicated on the map. The map must indicate the following:</p> <ul style="list-style-type: none"> <li>• an accurate indication of the project site position as well as the positions of the alternative sites, if any;</li> <li>• road access from all major roads in the area;</li> <li>• road names or numbers of all major roads as well as the roads that provide access to the site(s);</li> <li>• all roads within a 1km radius of the site or alternative sites; and</li> <li>• A north arrow.</li> </ul>
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## APPLICATION FORM

**Owners consent:** In line with the requirements of the EIA regulations, letters of consent of all landowners or a detailed explanation by the applicant explaining why consent is not possible must be attached to the back of this document as Appendix B.

### 2. Activities applied for

An application may be made for more than one listed or specified activity that, together, make up one development proposal. All the listed activities that make up this application must be listed.

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant or notice) :	Describe each listed activity:
No. R.386 of 21 April 2006	1 (m)	1 The construction of facilities or infrastructure including associated structures or infrastructure, for – (m) any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including – (i) canals; (ii) channels; (iii) bridges; (iv) dams; and (v) weirs;
No. R.386 of 21 April 2006	4	4 The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5 cubic metres from a river, tidal lagoon, tidal river, lake, in-stream dam, floodplain or wetland.

Please note that any authorisation that may result out of this application will only cover activities applied for. Omissions may render any authorisation that is based on incomplete information to be nil and void.

### 3. Type of application

#### 3.1 Application for Basic Assessment

Is this an application for conducting a basic assessment (as defined in the regulations)?

YES	NO
YES	NO

If, YES, is a basic assessment report attached?

If, NO, please indicate when the basic assessment report will be submitted:

N/A
-----

#### 3.2 Application for Scoping and Environmental Impact Assessment (EIA)

Is this an application for Scoping and EIA (as defined in the regulations)?

YES	NO
YES	NO

If, YES, is a Scoping Report and Plan of Study for EIA attached?

If, NO, please indicate when the Scoping Report and Plan of Study for EIA will be submitted:

N/A
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The scoping report and/or the plan of study for EIA will be submitted after consultation with the competent authority:

YES	NO
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A consultation with the competent authority is hereby requested:

YES	NO
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APPLICATION FORM

4. Declarations

4.1 The independent Environmental Assessment Practitioner

I, BHJ Smit declare under oath that I -

- act as the independent environmental practitioner in this application ;
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2005;
- have and will not have no vested interest in the proposed activity proceeding;
- have no, and will not engage in, conflicting interests in the undertaking of the activity;
- undertake to disclose, to the competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the Environmental Impact Assessment Regulations, 2005;
- will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- will keep a register of all interested and affected parties that participated in a public participation process; and
- will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.

Signature of the environmental practitioner:

Ninham Shand (Pty) Ltd

Name of company:

20 May 2008

Date:

Signature of the Commissioner of Oaths:

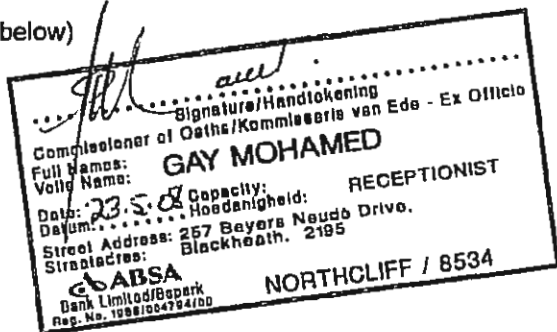
23.5.2008

Date:

RECEPTIONIST

Designation:

Official stamp (below)



# APPLICATION FORM

## 4.2 The Applicant

I, \_\_\_\_\_, declare under oath that I -

- Am, or represent, the applicant in this application;
- appointed the environmental assessment practitioner as indicated under point 4.1 above to act as the independent environmental assessment practitioner for this application;
- will provide the environmental assessment practitioner and the competent authority with access to all information at my disposal that is relevant to the application;
- will be responsible for the costs incurred in complying with the Environmental Impact Assessment Regulations, 2005, including but not limited to -
  - costs incurred in connection with the appointment of the environmental assessment practitioner or any person contracted by the environmental assessment practitioner;
  - costs incurred in respect of any process required in terms of the regulations;
  - costs in respect of any fee prescribed by the Minister or MEC in respect of the regulations;
  - costs in respect of specialist reviews, if the competent authority decides to recover costs; and
  - the provision of security to ensure compliance with conditions attached to an environmental authorisation, should it be required by the competent authority;
- will ensure that the environmental assessment practitioner is competent to comply with the requirements of these regulations;
- am responsible for complying with the conditions of any environmental authorisation issued by the competent authority;
- hereby indemnify, the government of the Republic, the competent authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action for which the applicant or environmental assessment practitioner is responsible in terms of these regulations; and
- will not hold the competent authority responsible for any costs that may be incurred by the applicant in proceeding with an activity prior to an appeal being decided in terms of these regulations.

Signature of the applicant:

Name of company:

Nulphat (PTY) LTD

Date:

22/5/2008

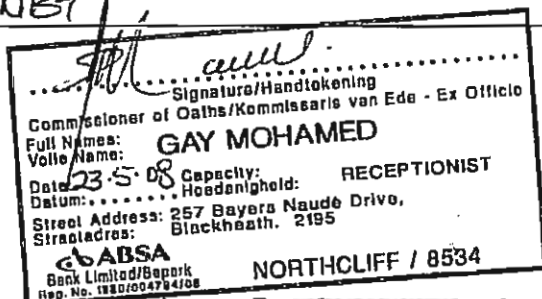
Signature of the Commissioner of Oaths:

23.5.2008

Date:

Designation:

Official stamp (below):



Department of Tourism, Environmental and Economic Affairs

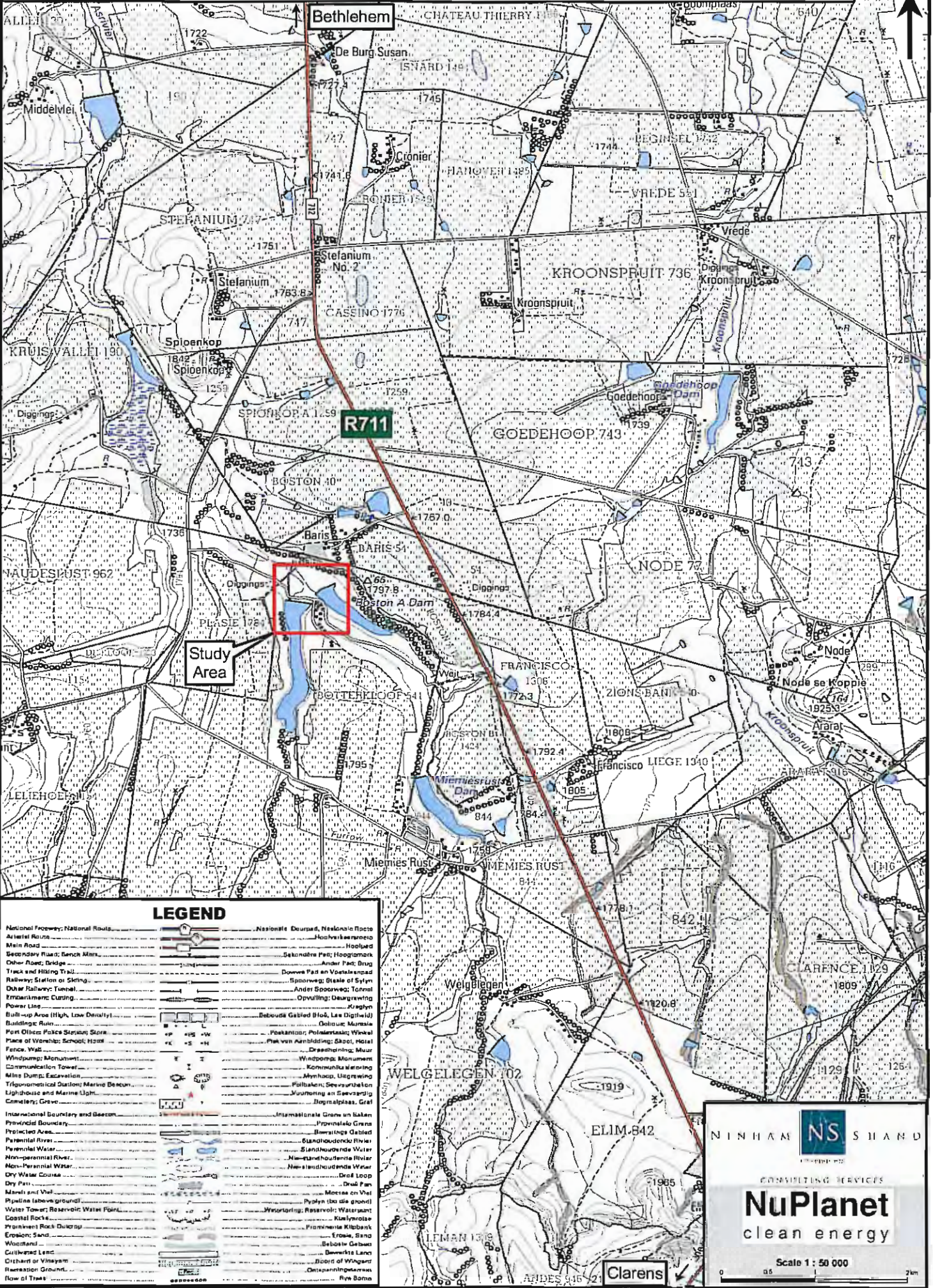
Environmental Impact Management Sub Directorate  
Private Bag X 20801, Bloemfontein, 9300 • Republic of South Africa • Republiek van Suid Afrika • Rephabolike ya Afrika Borwa  
C/o Zastron & Mark Graaff St., Fountain Towers Building • Tel +27 (0)51 400 4842 • Fax +27 (0)51 400 4811 • Email: [mkhosana@dteea.fs.gov.za](mailto:mkhosana@dteea.fs.gov.za)

**APPENDIX A1**

**GENERAL LOCALITY MAP  
OF THE BOTTERKLOOF HYDRO POWER  
PLANT (1:50 000)**



# General Locality Map of the Botterkloof Hydro Power Plant



**Study Area**

## LEGEND

National Freeway; National Route	Nasionale Oorspad, Nasionale Route	Hoofwaaieraanreë
Main Road	Hoofwaaier	
Secondary Road; Branch Main	Sekondêre Pad; Hoofwaaier	
Other Road; Bridge	Andere Pad; Brug	
Track and Riding Trail	Donner Pad en Voetspad	
Railway; Station or Siding	Spoorweg; Stasie of Symp	
Other Railway; Tunnel	Andere Spoorweg; Tunnel	
Embankment; Cutting	Opwelling; Daargrawing	
Power Line	Stroomlyn	
Built-up Area (High, Low Density)	Beboude Gebied Hoë, Laë Digtheid	
Building Ruin	Oudruie; Muurste	
Post Office; Police Station; Store	Postkantoor; Polisstasie; Winkel	
Place of Worship; School; House	Plaats van Aanbidding; Skool; Huis	
Fence; Wall	Draaheining; Muur	
Windmill; Monument	Wynwaaier; Monument	
Communication Tower	Kommunikasietoring	
Mine Dump; Excavation	Mynhuig; Uitgraving	
Trigonometrical Station; Marine Beacon	Polstasie; Seevaarwaaier	
Lighthouse and Marine Light	Waarwaaier en Seevaardig	
Cemetery; Grave	Begraafplaas; Graf	
International Boundary and Beacon	Internasionale Grens en Baken	
Provincial Boundary	Provinsiale Grens	
Protected Area	Bewingsgebied	
Perennial River	Staanhouende Rivier	
Seasonal Water	Staanhouende Water	
Non-perennial River	Nie-staanhouende Rivier	
Non-perennial Water	Nie-staanhouende Water	
Dry Water Course	Droë Loop	
Dry Pan	Droë Pan	
Mudflat and Vlei	Mooies en Vlei	
Swamp; Lake; Pond	Waarwaaier; Reservoir; Waterpomp	
Water Tower; Reservoir; Water Point	Waarwaaier; Reservoir; Waterpomp	
Coastal Rocks	Kuylvande	
Prankier; Rock Outcrop	Prankier; Klipbakk	
Erosion; Sand	Erosie; Sand	
Woodland	Boskultuur	
Cultivated Land	Bewaaide Land	
Orchard or Vineyard	Boord of Wynland	
Recreation Ground	Ontspanningsgebied	
Flow of Time	Ryebaan	

NINHAM **NS** SHAND  
CONSULTING SERVICES

**NuPlanet**  
clean energy

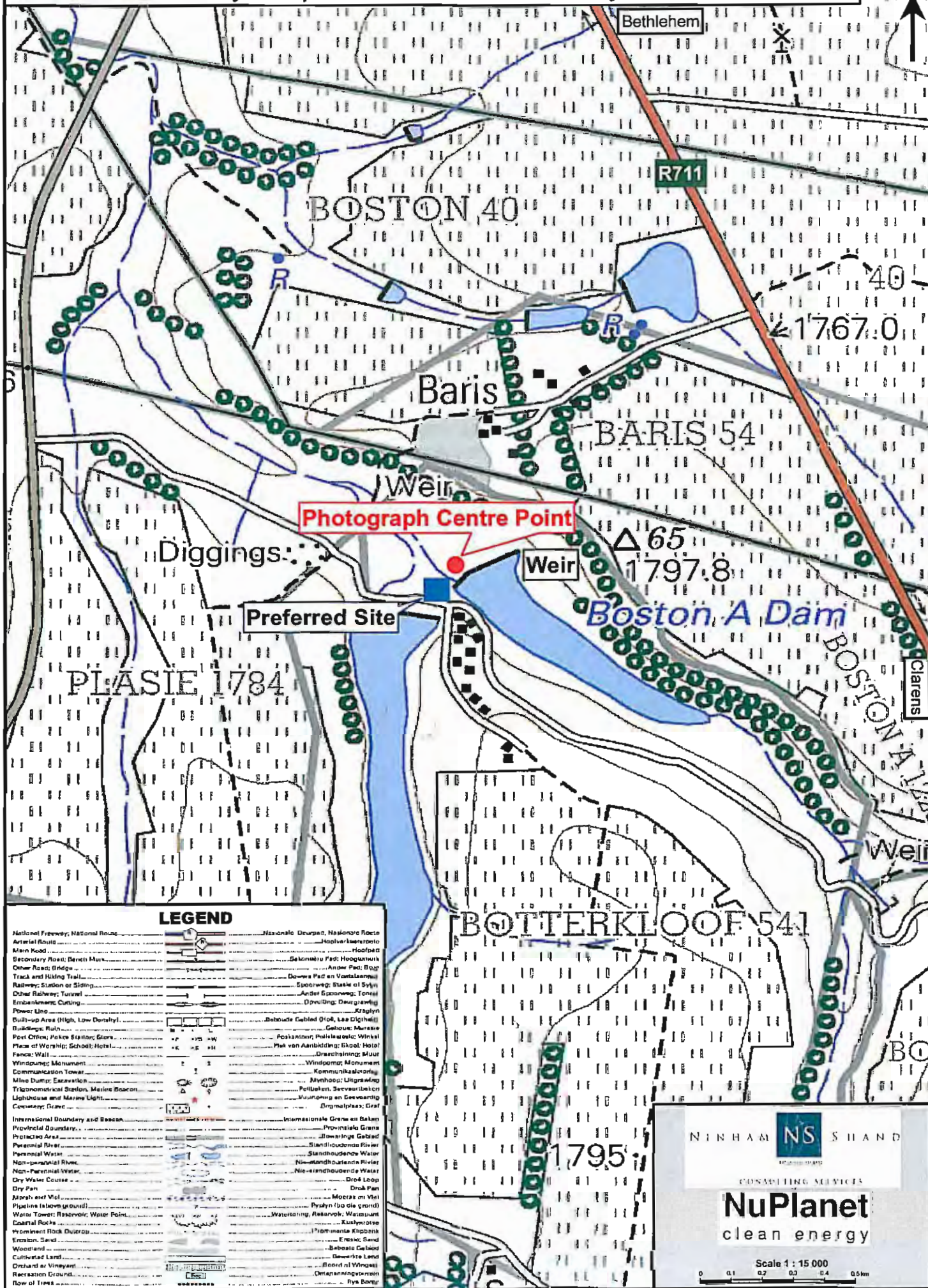
Scale 1 : 50 000



**APPENDIX A2**

**DETAILED LOCALITY MAP  
OF THE BOTTERKLOOF HYDRO POWER  
PLANT (1:15000)**

# Detailed Locality Map of the Botterkloof Hydro Power Plant



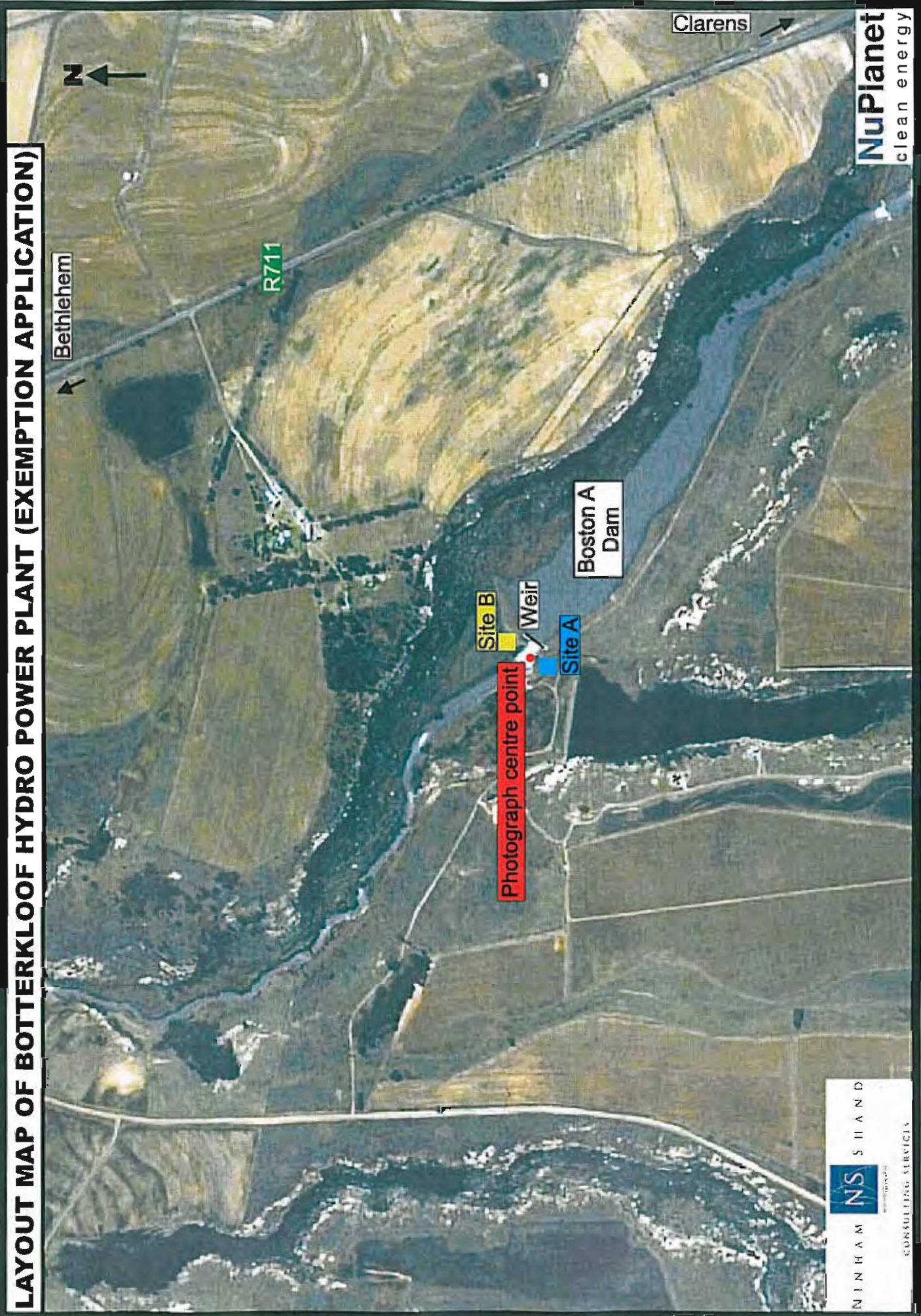


## **APPENDIX A3**

# **LAYOUT MAP OF BOTTERKLOOF HYDRO POWER PLANT (INDICATING SITE ALTERNATIVE FOR EXEMPTION PURPOSES)**



**LAYOUT MAP OF BOTTERKLOOF HYDRO POWER PLANT (EXEMPTION APPLICATION)**



**NuPlanet**  
clean energy

**NINHAM** NS S II AND  
CONSULTING SERVICES

**APPENDIX B**  
**LANDOWNER CONSENT**





## PAUL FARRELL BOERDERY (EDMS) BPK

Posbus 222  
Bethlehem  
9700

BTW Nr. 4410106571  
Tel: 058 - 2561131  
Faks: 058 - 2561372  
E-mail: farrell@isaf.co.za

8 February 2008

### LETTER OF INTENT: BOTTERKLOOF HYDRO

It is recognised that NuPlanet (Pty) Ltd is in the process of developing a small hydro power project provisionally called "Botterkloof Hydro", utilising the water resources of the As River at the Botterkloof Dam on the farm "Resterende gedeelte van die plaas Botterkloof 541"

As rightful owner **Paul Johannes Farrell** which owns "Resterende gedeelte van die plaas Botterkloof 541", hereby confirm his support of NuPlanet for the development of the hydro power project.

In this regard we would like to express of support and our clear intention to:

- Facilitate the development, construction and operation of a hydro power plant on the As River on the farm "Resterende gedeelte van die plaas Botterkloof 541".
- Enter into an agreement with NuPlanet (Pty) Ltd. to negotiate for the lease or sale of the land as required for the construction, establishment and the long-term operation of the hydro power plant.
- Enter into an agreement with NuPlanet (Pty) Ltd. for the permission to construct an electrical power line and roads as required across land owned by Paul Johannes Farrell to access the site connect the hydro power plant to a suitable point in the existing electricity grid.

The exact nature and legal status of the land lease agreement as well as the compensation for the use of the land will be determined to our mutual consent once the feasibility study of the project has been completed and the financing has been secured for the development of the project.

Yours truly



PJ Farrell

# Basic Assessment Report

# BASIC ASSESSMENT REPORT

## FREE STATE PROVINCE



(For official use only)

File Reference Number:						
Application Number:						
Date Received:						

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2006 set out in Regulations R. 385, R. 386 and R. 387 of the National Environmental Management Act, 1998 (Act No. 107 of 1998)

### Kindly note that:

1. This basic assessment report is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2006 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable tick the boxes that are applicable or black out the boxes that are not applicable in the report.
4. An incomplete report may be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
6. This report must be handed in at offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed reports will be accepted.
8. The report must be compiled by an independent environmental assessment practitioner.
9. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed. In addition, if it is clear to the EAP that because of the particular circumstances of the case it is not sensible to complete any of the sections indicated under paragraph 3 of this report, he or she may apply for exemption from completing that part of the report in the spaces provided in the report. It must however be noted that if the application for exemption is turned down, the report may have to be resubmitted.

BASIC ASSESSMENT REPORT

SECTION A: APPLICATION FOR EXEMPTION

The relevant parts of this section must be completed if the environmental assessment practitioner (EAP) on behalf of the applicant wishes to apply for exemption from completing or complying with certain parts of this basic assessment report.

1. APPLICATION FOR EXEMPTION FROM ASSESSING ALTERNATIVES:

At least two alternatives (site or activity) should be assessed. If that is not possible, the applicant should apply for exemption from having to assess alternatives. Such exemption will, however, not apply to the no-go alternative that must be assessed in all cases.

Provide a detailed motivation for not considering alternatives including an explanation of the reason for the application for exemption (supporting documents, if any, should be attached to this report):

The following serves as motivation for exemption from having to assess alternatives:

Site:

- The proposed Hydro Power Plant requires a specified hydrological velocity in order to generate the required 3MW. The proposed location of the Plant at the Boston A Dam Weir (Botterkloof 541) allows for sufficient flow of water to fulfill this requirement. Refer to Appendix F1 for a Layout Map of the area applicable to the application for exemption only.
The area to the south west of the weir (Site A) is the preferred site for the location of the Hydro Power Plant as the area has already been disturbed due to construction of the weir. Due to the location adjacent to the weir minimal environmental impacts are thus envisaged during the construction phase.
The south western part of the weir is also readily accessible due to an existing dirt road which leads to the site, thus eliminating the need to construct an access road which would result in further environmental damage.
Should the area to the north east (Site B) of the weir be selected, access can only be gained by means of a two tonne bridge across the weir but this will result in staggered transportation of equipment and material, which is not feasible. This bridge is also not suitable for construction vehicles.
Site A is obscured from the new housing development further south west and it can be deducted that the impacts would be negligible.

Activity:

- The proposed Hydro Power Plant would generate "green" electricity, which is a clean source of power, as it produces no carbon dioxide, sulphur dioxide, nitrous oxides, solid or liquid wastes. The alternative to a Hydro Power Plant would be a coal fired power station, which generates numerous environmental pollutants, negatively impacting on the environment.

I declare that the above motivation is accurate and, hereby apply for exemption in terms of regulation 51 of the Environmental Impact Assessment Regulations, 2006, from having to assess alternatives in this application as required in section 24(4)(b) in the National Environmental Management Act, 1998 (Act No. 107 of 1998)

Signature of the EAP:

[Handwritten signature]

Date:

16/04/2008

2. APPLICATION FOR EXEMPTION FROM COMPLETING OR COMPLYING WITH PART(S) OF THIS BASIC ASSESSMENT REPORT:

Application for exemption from completing or complying with certain parts of this basic assessment report may be made by completing the relevant sections below. Applications for exemptions from completing or complying with any other part of the basic assessment report must be made in the normal manner.

Indicate the numbers of the sections of this report for which exemption is applied for:

Table with 4 rows (Section B, C, D) and 12 columns for indicating exemption sections.

## BASIC ASSESSMENT REPORT

### 2. APPLICATION FOR EXEMPTION FROM COMPLETING OR COMPLYING WITH PART(S) OF THIS BASIC ASSESSMENT REPORT:

Application for exemption from completing or complying with certain parts of this basic assessment report may be made by completing the relevant sections below. Applications for exemptions from completing or complying with any other part of the basic assessment report must be made in the normal manner.

Indicate the numbers of the sections of this report for which exemption is applied for:

Section B:														
Section C:														
Section D:														

Provide a detailed motivation including an explanation of the reason for the application for exemption (supporting documents, if any, should be attached to this report):

**N/A**

I declare that the above motivation is accurate and, hereby apply for exemption in terms of regulation 51 of the EIA Regulations, 2006, from having to complete the indicated sections of the Basic Assessment Report.

Signature of the EAP:     **N/A**     Date: **N/A**



## SECTION B: ACTIVITY INFORMATION

### 1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for in detail (A1):

The proposed Hydro Power Plant will be located on the farm Botterkloof 541, approximately 15 km north of the town of Clarens in the Free State Province. The proposed Hydro Power Plant will convert the kinetic energy of water from the Botterkloof Dam, through a turbine and generator, into approximately 3MW of electrical energy that will be sold to Eskom and the Dihlabeng Municipality.

The proposed Hydro Power Plant will consist of the following infrastructure (Refer to Appendix C):

- An approach channel on the south western part of the weir;
- A power station adjacent to the weir;
- A tailrace culvert to divert water back into the return channel;
- A concrete gravity wall.

### 2. ALTERNATIVES

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

#### 2(a) Site alternatives:

Describe site alternative 1 (S1), for the activity described above, or for any other activity alternative:

The study area for the project is on the western bank of the Ash River, south west of the Botterkloof Dam. The site is located on the farm Botterkloof 541, approximately 15km north of the town of Clarens in the Free State Province.

The area to the south west of the weir is the preferred site for the location of the Hydro Power Plant (refer to Appendix A4) as the area has already been disturbed due to construction of the weir. Due to the location adjacent to the weir minimal environmental impacts are thus envisaged during the construction phase.

Describe site alternative 2 (S2), if any, for the activity described above, or for any other activity alternative:

N/A

Describe site alternative 3 (S3), if any, for the activity described above, or for any other activity alternative:

No go option.

#### (2)(b) Activity alternatives:

The proposed Hydro Power Plant would generate "green" electricity, which is a clean source of power, as it produces no carbon dioxide, sulphur dioxide, nitrous oxides, solid or liquid wastes. The alternative to a Hydro Power Plant would be a coal fired power station, which generates numerous environmental pollutants, negatively impacting on the environment. The consultant has applied for exemption from assessing alternatives in Section A of this document.

# BASIC ASSESSMENT REPORT

## 4. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

**Alternative:**

Alternative S1<sup>1</sup> (preferred or only site alternative)

Alternative S2 (if any)

Alternative S3 (if any)

Latitude (S):	Longitude (E):		
28°	25' 50.2''	28°	23' 04.9''
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

## 5. Physical size of the activity

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

**Alternative:**

**Size of the activity:**

Alternative A1<sup>2</sup> (preferred activity alternative)

Approximately 4000 m <sup>2</sup>
-----------------------------------

Alternative A2 (if any)

N/A
-----

Alternative A3 (if any)

N/A
-----

## 6. SITE ACCESS

Does ready access to the site exist, or is access directly from an existing road?

YES. Access exists from an existing dirt road that leads to the proposed site.
--

If NO, what is the distance over which a new access road will be built

N/A
-----

Describe the type of access road planned:

<p>No access road construction is envisaged due to the presence of an existing S217 and the dirt road which was constructed during construction of the Boston A Dam. The access road joins the R711 and runs to the east of the Ash river. The proposed access road will be properly upgraded and maintained in order to allow for continuous use during the construction period of the mini hydro. Refer to the Locality Maps (Appendices A1 and A2) as well as the Photographic Report (Appendix B).</p>
--

Include the position of the access road on the site plan.

## 7. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

### 7(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES
-----

If yes, what estimated quantity will be produced per month?

Approximately 5000kg
----------------------

How will the construction solid waste be disposed of (describe)?

<sup>1</sup> "Alternative S.." refer to site alternatives.

<sup>2</sup> "Alternative A.." refer to activity, process, technology or other alternatives.

## BASIC ASSESSMENT REPORT

Domestic solid waste will be collected by the contractor and transported to an approved Dhlabeng Municipal solid waste landfill for disposal.

Construction solid waste will comprise of the following:

- Construction building rubble and excess cut material – to be disposed of on nearby municipal waste site.
- Empty cement bags – to be disposed of on nearby municipal general waste site.
- Plastic wrapping and other domestic waste – to be disposed of on nearby municipal general waste site.

Construction waste disposal must be determined by the Waste Manager at Dhlabeng Municipality (Mr. Ruben Evans – Tel: 0583035732, Fax: 0583035076)

Where will the construction solid waste be disposed of (describe)?

As indicated above.

Will the activity produce solid waste during its operational phase?  
If yes, what estimated quantity will be produced per month?

NO

N/A

How will the solid waste be disposed of (describe)?

N/A

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

N/A

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, the application should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?  
If yes, inform the competent authority and request a change to an application for scoping and EIA.

NO

Is the activity that is being applied for a solid waste handling or treatment facility?  
If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

NO

Describe the measures, if any, that will be taken to ensure the optimal reuse or recycling of materials:

Recycling of materials in this instance is generally not feasible.

Has a specialist been consulted to assist with the completion of this section?

NO

### 7(b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a Municipal sewage system?

If yes, what estimated quantity will be produced per month?

Will the activity produce any effluent that will be treated and/or disposed of on site?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility?

NO

N/A

NO

NO

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

N/A

Has a specialist been consulted to assist with the completion of this section?

NO

Are any further specialist studies recommended by the specialist?

NO

If YES, specify: N/A

### 7(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

If yes, is it controlled by any legislation of any sphere of government?

NO

N/A

## BASIC ASSESSMENT REPORT

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

N/A

Has a specialist been consulted to assist with the completion of this section?

NO

**7(d) Generation of noise**  
Will the activity generate noise?

Yes. Noise generation is expected during the construction phase and mitigation measures are put forward in the EMP (Appendix G1).

If yes, is it controlled by any legislation of any sphere of government?

NO

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

The proposed activity will only generate noise during construction phase due to operation of construction vehicles and plant. During the operational phase the flow of water through the turbine will comply with the current legislative requirements, but it needs to be noted that it will not be more than the current noise emitted from the outlet of the dam. The current noise of water over the weir and noise measurements of similar construction activities as those that will take place at the proposed site is quantified in (Appendix G1).

Has a specialist been consulted to assist with the completion of this section?

NO

### 8. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box (es)

#### Construction Phase

municipal	water board	groundwater	river, stream, dam	other	the activity will not use water
-----------	-------------	-------------	--------------------	-------	---------------------------------

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

Approximately 7m<sup>3</sup>

Does the activity require a water use permit from the Department of Water Affairs and Forestry?

NO

#### Operational Phase

municipal	water board	groundwater	river, stream, dam	other	the activity will not use water
-----------	-------------	-------------	--------------------	-------	---------------------------------

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

No abstraction will take place, water will be diverted back into river.

Does the activity require a water use permit from the Department of Water Affairs and Forestry?

YES

**NOTE: The Water Use Permit Application does not form part of this Basic Assessment Report, and will be submitted by the project applicant. The water permit will be applied for in terms of the stream diversion, abstraction of water is not applicable in this case.**

### 9. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

N/A

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

N/A

## BASIC ASSESSMENT REPORT

### 10. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document. The site or route plans must indicate the following:

- 10(a) The scale of the plan which must be at least a scale of 1:500;
- 10(b) the property boundaries and numbers of all the properties within 50m of the site;
- 10(c) the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 10(d) the exact position of each element of the application as well as any other structures on the site;
- 10(e) the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 10(f) all trees and shrubs taller than 1.8m;
- 10(g) walls and fencing including details of the height and construction material;
- 10(h) servitudes indicating the purpose of the servitude;
- 10(i) sensitive environmental elements within 100m of the site or sites including (but not limited thereto):
  - rivers;
  - the 1:100 year flood line (where available or where it is required by DWAF);
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation (even if it is degraded or invested with alien species);
- 10(j) for gentle slopes the 1m contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- 10(k) the positions from where photographs of the site were taken.

**Refer to Appendices A1, A2 and A4**

### 11. SITE PHOTOGRAPHS

**Refer to Appendix B**

### 12. FACILITY ILLUSTRATION

**Refer to Appendix C**

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

### 13. ACTIVITY MOTIVATION

#### 13(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?

What is the expected yearly income that will be generated by or as a result of the activity?

Will the activity contribute to service infrastructure or is it a public amenity?

Is the activity a public amenity?

How many new employment opportunities will be created in the development phase of the activity?

What is the expected value of the employment opportunities during the development phase?

What percentage of this will accrue to previously disadvantaged individuals?

R50 000 000	
R5 000 000	
YES	NO
YES	NO
Approximately 60	
R10 000 000	
50%	

## BASIC ASSESSMENT REPORT

How many permanent new employment opportunities will be created during the operational phase of the activity?

2 full time jobs, one skilled and the other semi skilled for operational and maintenance purposes and approximately 60 part time staff members during construction. The construction period is anticipated to be 12 months.

What is the expected current value of the employment opportunities during the first 10 years?

R1 000 000

What percentage of this will accrue to previously disadvantaged individuals?

20-100%

**13(b) Need and desirability of the activity**

Motivate and explain the need and desirability of the activity (including demand for the activity):

The parastatal organisation Eskom, has for many years had a virtual monopoly for the generation and distribution of electricity throughout South Africa. A large proportion of electricity generated in South Africa is from coal fired power stations. In the past the growth in demand for electricity has been overestimated. New power stations, constructed in order to meet the projected demand, resulted in the decommissioning of older power stations when the demand did not materialise. The power demand has now risen to the extent that Eskom are in the process of re-commissioning older power stations, and the construction of new power generation facilities is underway.

The South African Government have put measures in place to deregulate the generation, reticulation and supply of electricity. Independent Power Producers (IPP) have now entered the market. The proposed project would enter the market as an IPP and make power available for development. The proposed project would provide "green" electricity to Eskom and the Dhlabeng Municipality. "Green" electricity is a clean source of power, as it produces no carbon dioxide, sulphur dioxide, nitrous oxide or any other emissions. The proposed development may therefore possibly postpone the development and construction of new coal fired power stations, thereby also reducing CO<sub>2</sub> emissions. The proposed Botterkloof Hydro Power Plant will harness a renewable energy source that is presently not utilised.

Indicate any benefits that the activity will have for society in general:

Projects such as the proposed Botterkloof Hydro Power Plant could be considered a Clean Development Mechanisms (CDM) project. Projects such as these provide developed countries investment opportunities in low-cost abatement projects and receive credit for the resulting emissions reductions, thus reducing the cutbacks needed within their borders. Developing countries also benefit by the increased investment flows, but also from the requirement that these types of investments advance sustainable development goals.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

Lower energy tariffs and opportunity for employment from local communities.

## BASIC ASSESSMENT REPORT

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### 14. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:	Administering authority:	Date:
National Environmental Management Act (No. 107 of 1998).	National & Provincial	27 November 1998
Government Notice R.386 of 21 April 2006 (Regulation No. 1(k))	National	21 April 2006

## BASIC ASSESSMENT REPORT

# SECTION C: SITE/AREA DESCRIPTION

**Important note:** For linear activities (pipelines etc) as well as activities that cover very large sites, it may be necessary to complete Section C for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No. (e.g. A):

(complete only when appropriate)

### 1. GRADIENT OF THE SITE

Indicate the general gradient of the sites.

**Alternative S1:**

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

**Alternative S2: N/A**

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

**Alternative S3: N/A**

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

### 2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site.

**Alternative S1:**

Ridgeline	Plateau	Side-slope of hill/mountain	Closed valley	Open valley	<b>Plain</b>	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	-------------	--------------	----------------------------	------	-----------

**Alternative S2: N/A**

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
-----------	---------	-----------------------------	---------------	-------------	-------	----------------------------	------	-----------

### 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following (tick the appropriate boxes)?

	Alternative S1:	Alternative S2:
Shallow water table (less than 1.5m deep)	NO	N/A
Dolomite, sinkhole or doline areas	NO	N/A
Seasonally wet soils (often close to water bodies)	YES	N/A
Unstable rocky slopes or steep slopes with loose soil	NO	N/A
Dispersive soils (soils that dissolve in water)	NO	N/A
Soils with high clay content (clay fraction more than 40%)	NO	N/A
Any other unstable soil or geological feature	NO	N/A
An area sensitive to erosion	NO	N/A

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

HAS A SPECIALIST BEEN CONSULTED TO ASSIST WITH THE COMPLETION OF THIS SECTION?

NO



## BASIC ASSESSMENT REPORT

### 4. GROUNDCOVER

Tick the types of groundcover present on the site.

#### Alternative S1:

Please note that none of the options below have been selected due to the fact that the site is a rehabilitated area with scattered aliens, thus no natural vegetation is present.

Natural veld - good condition <sup>E</sup>	Natural veld with scattered aliens <sup>E</sup>	Natural veld with heavy alien infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

Has a specialist been consulted?

YES

If YES, please complete the following:

Name of the specialist:

Mr. BHJ Smit

Qualification(s) of the specialist:

Registered Professional Landscape Architect (Registration Number: 99096) with South African Council for the Landscape Architectural Profession.

Postal address:

Private Bag X136, Centurion

Postal code:

0046

Telephone:

012 643 9000

Cell:

083 540 3661

E-mail:

Barend.smit@shands.co.za

Fax:

013 663 3527

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?

NO

If YES, specify and explain:

N/A

Are there any special or sensitive habitats or other natural features present on any of the alternative sites?

NO

If YES, specify and explain:

N/A

Are any further specialist studies recommended by the specialist?

NO

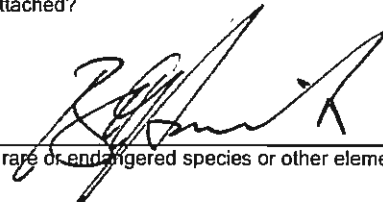
If YES, specify:

N/A

If YES, is such a report(s) attached?

N/A

Signature of specialist:



Date:

11/11/2008

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

#### Alternative S2: N/A

Natural veld - good condition <sup>E</sup>	Natural veld with scattered aliens <sup>E</sup>	Natural veld with heavy alien infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

Has a specialist been consulted? N/A

YES

NO

If YES, please complete the following:

Name of the specialist:

N/A

Qualification(s) of the specialist:

N/A

Postal address:

N/A

Postal code:

N/A

Telephone:

N/A

Cell:

N/A

E-mail:

N/A

Fax:

N/A

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites? N/A

YES

NO

If YES, specify and explain:

N/A

## BASIC ASSESSMENT REPORT

Are there any special or sensitive habitats or other natural features present on any of the alternative sites? <b>N/A</b>	YES	NO
If YES, specify and explain: <b>N/A</b>		
Are any further specialist studies recommended by the specialist? <b>N/A</b>	YES	NO
If YES, specify: <b>N/A</b>		
If YES, is such a report(s) attached? <b>N/A</b>	YES	NO
Signature of specialist: <b>N/A</b>	Date: <b>N/A</b>	

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

### Alternative S3: **N/A**

Natural veld - good condition <sup>E</sup>	Natural veld with scattered aliens <sup>E</sup>	Natural veld with heavy alien infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

Has a specialist been consulted? <b>N/A</b>	YES	NO
If YES, please complete the following:		
Name of the specialist:	<b>N/A</b>	
Qualification(s) of the specialist:	<b>N/A</b>	
Postal address:	<b>N/A</b>	
Postal code:	<b>N/A</b>	
Telephone:	<b>N/A</b>	<b>N/A</b>
E-mail:	<b>N/A</b>	<b>N/A</b>

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?	YES	NO
If YES, specify and explain: <b>N/A</b>		
Are there any special or sensitive habitats or other natural features present on any of the alternative sites?	YES	NO
If YES, specify and explain: <b>N/A</b>		
Are any further specialist studies recommended by the specialist?	YES	NO
If YES, specify: <b>N/A</b>		
If YES, is such a report(s) attached?	YES	NO
Signature of specialist: <b>N/A</b>	Date: <b>N/A</b>	

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

## 5. LAND USE CHARACTER OF SURROUNDING AREA

Black out land uses and/or prominent features that does not currently occur within a 500m radius of the site

### Alternative S1:

Natural area	Low density residential	Medium density residential	High density residential	Informal residential <sup>A</sup>
Retail	Commercial & warehousing	Light industrial	Medium industrial <sup>AM</sup>	Heavy industrial <sup>AM</sup>
Power station <sup>A</sup>	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam <sup>A</sup>	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center	School	Tertiary education facility	Church	Old age home
Sewage treatment plant <sup>A</sup>	Train station or shunting yard <sup>N</sup>	Railway line <sup>N</sup>	Major road (4 lanes or more) <sup>N</sup>	Airport <sup>N</sup>
Harbour	Sport facilities	Golf course	Polo fields	Filling station <sup>N</sup>
Landfill or waste treatment site <sup>A</sup>	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Gravoyard	Archeological site
Other land-uses (describe):				

## BASIC ASSESSMENT REPORT

If any of the boxes marked with an "N" are ticked, please consult an appropriate noise specialist to assist in the completion of this section.

Has a specialist been consulted?

NO

If YES, please complete the following:

Name of the specialist:

N/A

Qualification(s) of the specialist:

N/A

Postal address:

N/A

Postal code:

N/A

Telephone:

N/A

Cell: N/A

E-mail:

N/A

Fax: N/A

Will the ambient noise level have a negative impact on the proposed activity?

YES

NO

If YES, specify and explain:

N/A

YES

NO

Are any further specialists or studies recommended by the specialist? N/A

If YES, specify:

N/A

If YES, is such a report(s) attached?

YES

NO

Signature of specialist:

N/A

Date:

N/A

If any of the boxes marked with an "A" are ticked, please consult an appropriate air quality specialist to assist in the completion of this section.

Has a specialist been consulted?

NO

If YES, please complete the following:

Name of the specialist:

N/A

Qualification(s) of the specialist:

N/A

Postal address:

N/A

Postal code:

N/A

Telephone:

N/A

Cell: N/A

E-mail:

N/A

Fax: N/A

Will the ambient air pollution level have a negative impact on the proposed activity?

YES

NO

If YES, specify and explain:

N/A

YES

NO

Are any further specialist studies recommended by the specialist? N/A

If YES, specify:

N/A

If YES, is such a report(s) attached?

YES

NO

Signature of specialist:

N/A

Date:

N/A

If any of the boxes marked with an "H" are ticked, please consult an appropriate health assessment specialist to assist in the completion of this section.

Has a specialist been consulted?

NO

If YES, please complete the following:

Name of the specialist:

N/A

Qualification(s) of the specialist:

N/A

Postal address:

N/A

Postal code:

N/A

Telephone:

N/A

Cell: N/A

E-mail:

N/A

Fax: N/A

Will the surrounding land use pose any unacceptable health risk on the proposed activity?

YES

NO

If YES, specify and explain:

N/A

YES

NO

Are any further specialist studies recommended by the specialist? N/A

## BASIC ASSESSMENT REPORT

If YES, specify: N/A

If YES, is such a report(s) attached?  YES  NO

Signature of specialist: N/A Date: N/A

**Alternative S2: N/A**

Natural area	Low density residential	Medium density residential	High density residential	Informal residential <sup>A</sup>
Retail	Commercial & warehousing	Light Industrial	Medium industrial <sup>AN</sup>	Heavy industrial <sup>AN</sup>
Power station <sup>A</sup>	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam <sup>A</sup>	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center	School	Tertiary education facility	Church	Old age home
Sewage treatment plant <sup>A</sup>	Train station or shunting yard <sup>N</sup>	Railway line <sup>N</sup>	Major road (4 lanes or more) <sup>N</sup>	Airport <sup>N</sup>
Harbour	Sport facilities	Golf course	Polo fields	Filling station <sup>H</sup>
Landfill or waste treatment site <sup>A</sup>	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archeological site
Other land uses (describe):				

If any of the boxes marked with an "N" are ticked, please consult an appropriate noise specialist to assist in the completion of this section.

Has a specialist been consulted? N/A  YES  NO

If YES, please complete the following:

Name of the specialist: N/A

Qualification(s) of the specialist: N/A

Postal address: N/A

Postal code: N/A

Telephone: N/A Cell: N/A

E-mail: N/A Fax: N/A

Will the ambient noise level have a negative impact on the proposed activity? N/A  YES  NO

If YES, specify and explain: N/A

Are any further specialist studies recommended by the specialist? N/A  YES  NO

If YES, specify: N/A

If YES, is such a report(s) attached? N/A  YES  NO

Signature of specialist: N/A Date: N/A

If any of the boxes marked with an "A" are ticked, please consult an appropriate air quality specialist to assist in the completion of this section.

Has a specialist been consulted? N/A  YES  NO

If YES, please complete the following:

Name of the specialist: N/A

Qualification(s) of the specialist: N/A

Postal address: N/A

Postal code: N/A

Telephone: N/A Cell: N/A

E-mail: N/A Fax: N/A

Will the ambient air pollution level have a negative impact on the proposed activity? N/A  YES  NO

If YES, specify and explain: N/A

Are any further specialist studies recommended by the specialist?  YES  NO

If YES, specify: N/A

## BASIC ASSESSMENT REPORT

If YES, is such a report(s) attached?

YES	NO
-----	----

Signature of specialist:     N/A    

Date:     N/A    

If any of the boxes marked with an <sup>“H”</sup> are ticked, please consult an appropriate health assessment specialist to assist in the completion of this section.

Has a specialist been consulted?     N/A    

YES	NO
-----	----

If YES, please complete the following:

Name of the specialist:	<u>    N/A    </u>		
Qualification(s) of the specialist:	<u>    N/A    </u>		
Postal address:	<u>    N/A    </u>		
Postal code:	<u>    N/A    </u>		
Telephone:	<u>    N/A    </u>	Cell:	<u>    N/A    </u>
E-mail:	<u>    N/A    </u>	Fax:	<u>    N/A    </u>

Will the surrounding land use pose any unacceptable health risk on the proposed activity?     N/A    

YES	NO
-----	----

If YES, specify and explain:     N/A    

Are any further specialist studies recommended by the specialist?     N/A    

YES	NO
-----	----

If YES, specify:     N/A    

If YES, is such a report(s) attached?     N/A    

YES	NO
-----	----

Signature of specialist:     N/A    

Date:     N/A    

**Alternative S3:     N/A**

Natural area	Low density residential	Medium density residential	High density residential	Informal residential <sup>A</sup>
Retail	Commercial & warehousing	Light industrial	Medium industrial <sup>AN</sup>	Heavy industrial <sup>AN</sup>
Power station <sup>A</sup>	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex	Hospitality facility
Open cast mine	Underground mine	Spoil heap or slimes dam <sup>A</sup>	Quarry, sand or borrow pit	Dam or reservoir
Hospital/medical center	School	Tertiary education facility	Church	Old age home
Sewage treatment plant <sup>A</sup>	Train station or shunting yard <sup>N</sup>	Railway line <sup>N</sup>	Major road (4 lanes or more) <sup>N</sup>	Airport <sup>N</sup>
Harbour	Sport facilities	Golf course	Polo fields	Filling station <sup>H</sup>
Landfill or waste treatment site <sup>A</sup>	Plantation	Agriculture	River, stream or wetland	Nature conservation area
Mountain, koppie or ridge	Museum	Historical building	Graveyard	Archeological site
Other land uses (describe):				

If any of the boxes marked with an <sup>“N”</sup> are ticked, please consult an appropriate noise specialist to assist in the completion of this section.

Has a specialist been consulted?     N/A    

YES	NO
-----	----

If YES, please complete the following:

Name of the specialist:	<u>    N/A    </u>		
Qualification(s) of the specialist:	<u>    N/A    </u>		
Postal address:	<u>    N/A    </u>		
Postal code:	<u>    N/A    </u>		
Telephone:	<u>    N/A    </u>	Cell:	<u>    N/A    </u>
E-mail:	<u>    N/A    </u>	Fax:	<u>    N/A    </u>

Will the ambient noise level have a negative impact on the proposed activity?     N/A    

YES	NO
-----	----

If YES, specify and explain:     N/A    

Are any further specialist studies recommended by the specialist?     N/A    

YES	NO
-----	----

If YES, specify:     N/A    

If YES, is such a report(s) attached?     N/A    

YES	NO
-----	----

Signature of specialist:     N/A    

Date:     N/A

## BASIC ASSESSMENT REPORT

If any of the boxes marked with an "A" are ticked, please consult an appropriate air quality specialist to assist in the completion of this section.

Has a specialist been consulted? N/A

YES	NO
-----	----

If YES, please complete the following:

Name of the specialist:	<u>N/A</u>		
Qualification(s) of the specialist:	<u>N/A</u>		
Postal address:	<u>N/A</u>		
Postal code:	<u>N/A</u>		
Telephone:	<u>N/A</u>	Cell:	<u>N/A</u>
E-mail:	<u>N/A</u>	Fax:	<u>N/A</u>

Will the ambient air pollution level have a negative impact on the proposed activity? N/A

YES	NO
-----	----

If YES, specify and explain: N/A

Are any further specialist studies recommended by the specialist? 

YES	NO
-----	----

If YES, specify: N/A

If YES, is such a report(s) attached? 

YES	NO
-----	----

Signature of specialist: N/A Date: N/A

If any of the boxes marked with an "A" are ticked, please consult an appropriate health assessment specialist to assist in the completion of this section.

Has a specialist been consulted? N/A

YES	NO
-----	----

If YES, please complete the following:

Name of the specialist:	<u>N/A</u>		
Qualification(s) of the specialist:	<u>N/A</u>		
Postal address:	<u>N/A</u>		
Postal code:	<u>N/A</u>		
Telephone:	<u>N/A</u>	Cell:	<u>N/A</u>
E-mail:	<u>N/A</u>	Fax:	<u>N/A</u>

Will the surrounding land use pose any unacceptable health risk on the proposed activity? N/A

YES	NO
-----	----

If YES, specify and explain: N/A

Are any further specialist studies recommended by the specialist? 

YES	NO
-----	----

If YES, specify: N/A

If YES, is such a report(s) attached? 

YES	NO
-----	----

Signature of specialist: N/A Date: N/A

### 6. CULTURAL/HISTORICAL FEATURES

#### Alternative S1

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or palaeontological sites, on or close (within 20m) to the site? 

NO
NO

If YES, explain: N/A

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist: N/A

Will any building or structure older than 60 years be affected in any way? 

NO
----

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)? 

NO
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If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

## BASIC ASSESSMENT REPORT

**Alternative S2: N/A**

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?	N/A
If YES, explain:	N/A
If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.	
Briefly explain the findings of the specialist:	N/A
Will any building or structure older than 60 years be affected in any way?	N/A
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	N/A
If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.	

## SECTION D: PUBLIC PARTICIPATION

### Refer to Appendix E for all Public Participation Documentation

#### 1. ADVERTISEMENT

The environmental assessment practitioner must follow any relevant guidelines adopted by the competent authority in respect of public participation and must at least –

- 1(a) Fix a notice in a conspicuous place, on the property where it is intended to undertake the activity which states that an application will be submitted to the competent authority in terms of these regulations and which provides information on the proposed nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations on the application may be made.
- 1(b) Inform landowners and occupiers of adjacent land of the applicant's intention to submit an application to the competent authority
- 1(c) Inform landowners and occupiers of land within 100 metres of the boundary of the property where it is proposed to undertake the activity and whom may be directly affected by the proposed activity of the applicant's intention to submit an application to the competent authority;
- 1(d) Inform the ward councillor and any organisation that represents the community in the area of the applicant's intention to submit an application to the competent authority;
- 1(e) Inform the municipality which has jurisdiction over the area in which the proposed activity will be undertaken of the applicant's intention to submit an application to the competent authority; and
- 1(f) Inform any organ of state that may have jurisdiction over any aspect of the activity of the applicant's intention to submit an application to the competent authority; and
- 1(g) Place a notice in one local newspaper and any Gazette that is published specifically for the purpose of providing notice to the public of applications made in terms of these regulations.

#### 2. CONTENT OF ADVERTISEMENTS AND NOTICES

Advertisements and notices must indicate that an application will be submitted to the competent authority in terms of the EIA regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made;

#### 3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any Gazette that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for site alternatives where appropriate.

#### 4. DETERMINATION OF APPROPRIATE MEASURES

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

## BASIC ASSESSMENT REPORT

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### 5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

### 6. LOCAL AUTHORITY PARTICIPATION

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least 30 (thirty) calendar days before the submission of the application.

Has any comment been received from the local authority?

YES	NO
-----	----

If "YES", briefly describe the feedback below (also attach any correspondence to and from the local authority to this application):

No comments were received from the local authority.

### 7. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application at least 30 (thirty) calendar days before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES	NO
-----	----

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

No comments were received from any stakeholders.



## SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2006, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

### 1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the issues raised by interested and affected parties.

Interested and affected parties (I&APs) raised the following concerns:

- Noise pollution;
- Visual impact;
- Dust due to access road;
- Soil pollution;
- Light emitted from Hydro Power Plant at night;
- Safety of Estate (access) and disturbance of game;
- Trembling of turbines during operational stage;
- Location clarification;
- Disposal of solid waste; and
- Whether Bavaria was consulted as part of Public Participation Process (PPP).

Refer to Appendices E7 and E8 for detailed comments and responses.

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report):

Comments from I&APs were noted and draft Basic Assessment Reports will be made available for public comment.

Solid waste (domestic & construction) will be collected by the contractor and transported to an approved Dihlabeng Municipal solid waste landfill for disposal. The disposal of Construction solid waste will be determined by the Waste Manager at Dihlabeng Municipality (Mr. Ruben Evans - Tel: 0583035732, Fax: 0583035076).

Refer to Appendices E7 and E8 for detailed comments and responses.

### 2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

List the potential site alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, including impacts relating to the choice of site alternatives.

#### Alternative S1 (preferred alternative)

Direct impacts: **None**

Indirect impacts: **None**

Cumulative impacts **None**

#### Alternative S2 **N/A**

Direct impacts: **N/A**

Indirect impacts: **N/A**

Cumulative Impacts: **N/A**

#### Alternative S3 **N/A**

Direct impacts: **N/A**

Indirect impacts: **N/A**

Cumulative impacts: **N/A**

## BASIC ASSESSMENT REPORT

**No-go alternative (compulsory)**

Direct impacts: None

Indirect impacts: None

Cumulative impacts: None

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative S1	Alternative S2	Alternative S3
N/A	N/A	N/A

List the potential activity/technology alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase:

**Alternative A1 (preferred alternative)**

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

**Alternative A2 N/A**

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

**Alternative A3 N/A**

Direct impacts: N/A

Cumulative impacts: N/A

Indirect impacts: N/A

**No-go alternative (compulsory)**

Direct impacts: None

Indirect impacts: None

Cumulative impacts: None

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative A1:	Alternative A2:	Alternative A3:
N/A	N/A	N/A

## BASIC ASSESSMENT REPORT

### 3. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

List the potential site alternative related impacts (as appropriate) that are likely to occur as a result of the construction phase:

#### Alternative S1 (preferred alternative)

##### Direct impacts:

- Visual impact of the infrastructure: During construction, excavations as well as construction of a tailrace culvert, power station and concrete gravity wall would be undertaken. A backfilled embankment would also be established and there would thus be a concomitant visual impact on the proposed site. (Refer to Appendix C2)
- Windblown dust from excavations: Construction activities are likely to result in the increased production of windblown dust. The quantity of dust generated would be dependant on which season the construction takes place in, and the prevailing wind direction.
- Impacts on ambient noise levels: Construction activities and construction personnel on site, as well as construction vehicles moving to and from site could result in an increase in ambient noise levels in the area. The noise could have a short-term detrimental effect, but the impact would cease once construction has ended ( Refer to Appendix G1).
- Litter / waste production: Due to construction activities a large degree of waste and litter could be generated. The effects of these factors on the biophysical environment would be small but could be more significant for the aesthetics of the area if not properly controlled. There is also a risk of hazardous substances entering the river course or dam and causing contamination to the fauna.
- Impact on terrestrial flora: Vegetation plays an important role in the functioning of ecosystems as well as playing a vital role in maintaining biological processes in the soil. The removal of existing vegetation will result in a disruption of normal ecological functions. No plant species of conservation importance were identified during the site visit. Disturbances during construction will lead to colonisation by exotic invasive species.
- Impact on terrestrial fauna: Habitat loss is the lead cause of species loss around the world, however, the impacts would be restricted to the construction phase and would affect the immediate area around the construction sites i.e. 10m circumference at most.
- Impact on aquatic ecosystem: The impact on the ecology of the aquatic habitat will be very low / negligible.
- Erosion: There is the risk of erosion of embankments, slopes and topsoil as a result of increased runoff and the removal of topsoil.
- Sedimentation: One of the typical impacts of construction is sedimentation. This is due to the clearing of land, which leads to the runoff from the site having a high sediment load.
- Loss of topsoil: Topsoil is a valuable resource, and during construction, there is a real threat of loss of topsoil.
- Traffic: Construction vehicles would have to make use of the existing dirt road to access the site, which could impact negatively on traffic flow and safety in the area.
- Deterioration of water quality: During construction pollutants may find their way into the river system. Typical sources of pollution include oils and fuels from construction vehicles and construction materials such as cement, detergents, paints and other chemicals. This may compromise the water quality with concomitant negative impacts on the ecological integrity of the system.
- Temporary employment opportunities: Construction activities may provide temporary employment for a labour force from the local communities. Skilled, semi skilled and unskilled jobs would be created, which is a positive impact.

##### Indirect impacts:

- Windblown dust from access road: The movement of construction vehicles along the dirt access road could potentially generate additional windblown dust. The quantity of dust generated would be dependant on which season the construction takes place in, and the prevailing wind direction.

## BASIC ASSESSMENT REPORT

- Disturbance to adjoining landowners: Construction activities and construction personnel on site, as well as construction vehicles moving to and from site would cause a disturbance to adjacent landowners, although the low residential density curtails the significance of any impact on surrounding landowners.
- Security risks: During the construction phase a substantial labour force would be employed on the site, and this may pose a security risk to the surrounding property / infrastructure owners and users. Moreover, criminal elements may use the anonymity afforded by the construction activities to carry out criminal activities in the areas surrounding the proposed development ( Refer to Appendix G2 to view mitigation measures)
- Social impact on local communities: Increased numbers of workers, as well as increased amount of income in the area may have social consequences for the residents of the towns of Bethlehem and Clarens. The contractor will use local labour as and when required which will have a positive impact on the economy of the area. The temporary labourers will be trained in construction activities and this will increase the skill base of the community. The injection of money into the area, although aiding community needs may cause related social impacts such as theft and prostitution and the subsequent spread of HIV/AIDS, increased alcohol abuse, violence and crime.
- Potential impact on national power supply: The proposed project might alleviate some of the pressure on the national power grid, with potentially less additional coal-fired power stations being required.

### Cumulative impacts :

- Impact on terrestrial flora: Disturbances during construction could lead to colonisation by exotic invasive species. Colonisation of these invasive species will impact negatively on regional plant biodiversity as well as ecosystem integrity. The area to be excavated has already been disturbed due to agriculture and the construction of the Boston A Dam Weir.

### Alternative S2 N/A

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

### Alternative S3 N/A

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

### No-go alternative (compulsory)

Direct impacts:

The no go option will result in no generation of "green" energy and thus alternative energy sources (e.g. coal fired power stations) will need to be investigated. The social impact on local communities (i.e. temporary job creation and increase in skill base of the community) will also be negatively impacted upon.

Indirect impacts: N/A

Cumulative impacts: N/A

## BASIC ASSESSMENT REPORT

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative S1	Alternative S2	Alternative S3
<p><b>Visual Impact:</b> The development and implementation of an appropriate EMP (attached in Appendix G2) during the construction phase would serve to curtail any negative impacts on the visual aesthetics by ensuring the appropriate rehabilitation of disturbed areas after completion of construction. The construction period should be as short as possible and appropriately managed. Stockpiles should be no higher than two meters and should be covered to minimise erosion, dust generation and unsightly aesthetics.</p> <p><b>Windblown Dust:</b> Dust control measures should be implemented through the EMP (attached in Appendix G2) and the extent of the disturbed area reduced. Appropriate dust suppression measures, e.g. dampening with water, should be used when dust generation is unavoidable, particularly during prolonged periods of dry weather in summer. In addition, areas stripped should be minimised and phased to limit soil exposure. To combat dust generation and prevent erosion, re-vegetation should occur incrementally immediately upon completion of the construction activities at the subject location. Adhering to these mitigation measures will ensure that the impact is of low significance.</p> <p><b>Ambient noise levels:</b> Impacts on noise generation during construction in general should be mitigated by ensuring that all regulations relating to noise generation are observed and by restricting work to normal working hours. All machines should be equipped with appropriate noise reduction equipment and all vehicles should be roadworthy (including meeting maximum noise specifications) See Appendix G1.</p> <p><b>Litter / waste production:</b> Hazardous substances, e.g. diesel, oil, etc. shall be stored in dedicated areas developed to minimise the impact of spills. Applicable statutory requirements will be adhered to in terms of requirements for safe storage. All storage areas, spillage containment areas, containers of hazardous substances and dangerous equipment shall be clearly and prominently marked as such. Refuse and waste from the construction activities will not be disposed of on site, but will be removed to a registered waste dump by the contractor. The provision of suitable refuse disposal facilities and the effective implementation of the EMP could readily manage this potential impact.</p> <p><b>Terrestrial flora:</b> The attached EMP (Appendix G2) will be implemented to minimise the area of disturbance. The corridor of disturbance should be re-vegetated soon after construction. All the areas disturbed during construction work will be rehabilitated with indigenous species occurring in the area to a standard similar or better than before on completion of the works.</p> <p><b>Terrestrial fauna:</b> Given their inherent mobility, all fauna within the study area should be able to move away from the construction zone, to undisturbed land in the vicinity. As a result, the impact of construction on fauna would be considered of low significance and no mitigation is required.</p>	<p>N/A</p>	<p>N/A</p>



## BASIC ASSESSMENT REPORT

<p><u>Aquatic ecosystem:</u> The impact on the ecology of the aquatic habitat will be very low / negligible.</p> <p><u>Erosion:</u> The design of the temporary and permanent works shall include measures to prevent erosion resulting from concentration or increase in flow of stormwater caused by the presence of the works. Such measures shall include properly constructed watercourses and energy dissipaters to counter erosion and avoid discharges into agricultural lands or wetlands. Stockpiles shall be established only in demarcated areas and shall be well managed and maintained. No stockpiles will be established close to embankments or other slopes. Stockpiled materials shall not be allowed to spill into undisturbed areas or watercourses.</p> <p><u>Sedimentation:</u> Relatively little of the site would need to be cleared during construction, and accordingly relatively little sedimentation should occur. Where possible, construction activities should be scheduled to occur outside of the rainy season, thereby reducing the anticipated volume of runoff during construction. In addition, sediment traps and barriers would be employed where appropriate.</p> <p><u>Loss of topsoil:</u> Where possible, topsoil shall be removed approximately 250mm deep from all un-vegetated areas. It will be salvaged from all the areas to be used during construction and will be stockpiled for use during re-vegetation and landscaping.</p> <p><u>Traffic:</u> Impacts on traffic flow during construction should be further mitigated by ensuring that all regulations relating to traffic management are observed and by notifying the local traffic officials of the construction activities. Adequate and appropriate traffic warning signage and appropriate speed limits for construction vehicles should be adhered to.</p> <p><u>Water quality:</u> Careful management of the site and education of all construction staff would curtail the risk of pollution spills. The probability of this impact occurring could be further reduced via the implementation of the EMP attached in Appendix G2.</p> <p><u>Employment opportunities:</u> Members of the community could be employed as part of the labour force. No mitigation required.</p> <p><u>Disturbance to landowners:</u> The probability of this impact occurring could be further reduced via the implementation of the attached EMP (Appendix G2) and careful management of activities on site.</p> <p><u>Security risks:</u> The contractor should mitigate any security risks by closely monitoring his site personnel and their activities. The residents in the area can mitigate security risks by increased vigilance. Construction workers should be easily identifiable in a uniform.</p> <p><u>Social impacts:</u> The contractor should implement awareness campaigns, such as HIV/AIDS education to inform employees of the social and health implications of their actions. Local labour should be used as far as possible during the construction of the proposed development. The local people should be informed appropriately about</p>		
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## BASIC ASSESSMENT REPORT

<p>how this process will unfold. The contractor must ensure that signs indicating the availability / unavailability of jobs are and that the process of hiring local labour is managed correctly to prevent conflict situations and to manage the likely influx of causal labour seekers.</p>		
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List the potential activity/technology alternative related impacts (as appropriate) that are likely to occur as a result of the construction phase:

**Alternative A1 (preferred alternative)**

**Direct impacts:**

- Visual impact of the infrastructure: During construction, excavations as well as construction of a tailrace culvert, power station and concrete gravity wall would be undertaken. A backfilled embankment would also be established and there would thus be a concomitant visual impact on the proposed site (Refer to Appendix C2).
- Windblown dust from excavations: Construction activities are likely to result in the increased production of windblown dust. The quantity of dust generated would be dependant on which season the construction takes place in, and the prevailing wind direction.
- Impacts on ambient noise levels: Construction activities and construction personnel on site, as well as construction vehicles moving to and from site could result in an increase in ambient noise levels in the area. The noise could have a short-term detrimental effect, but the impact would cease once construction has ended (Refer to Appendix G1 for a quantification of noise measurements anticipated during construction).
- Litter / waste production: Due to construction activities a large degree of waste and litter could be generated. The effects of these factors on the biophysical environment would be small but could be more significant for the aesthetics of the area if not properly controlled. There is also a risk of hazardous substances entering the river course or dam and causing contamination to the fauna.
- Impact on terrestrial flora: Vegetation plays an important role in the functioning of ecosystems as well as playing a vital role in maintaining biological processes in the soil. The removal of existing vegetation will result in a disruption of normal ecological functions. No plant species of conservation importance were identified during the site visit. Disturbances during construction will lead to colonisation by exotic invasive species.
- Impact on terrestrial fauna: Habitat loss is the lead cause of species loss around the world, however, the impacts would be restricted to the construction phase and would affect the immediate area around the construction sites i.e. 10m circumference at most.
- Impact on aquatic ecosystem: The impact on the ecology of the aquatic habitat will be very low / negligible.
- Erosion: There is the risk of erosion of embankments, slopes and topsoil as a result of increased runoff and the removal of topsoil.
- Sedimentation: One of the typical impacts of construction is sedimentation. This is due to the clearing of land, which leads to the runoff from the site having a high sediment load.
- Loss of topsoil: Topsoil is a valuable resource, and during construction, there is a real threat of loss of topsoil.
- Traffic: Construction vehicles would have to make use of the existing dirt road to access the site, which could impact negatively on traffic flow and safety in the area.
- Deterioration of water quality: During construction pollutants may find their way into the river system. Typical sources of pollution include oils and fuels from construction vehicles and construction materials such as cement, detergents, paints and other chemicals. This may compromise the water quality with concomitant negative impacts on the ecological integrity of the system.
- Temporary employment opportunities: Construction activities may provide temporary employment for a labour force from the local communities. Skilled, semi skilled and unskilled jobs would be created, which is a positive impact.

## BASIC ASSESSMENT REPORT

### Indirect impacts:

- Windblown dust from access road: The movement of construction vehicles along the dirt access road could potentially generate additional windblown dust. The quantity of dust generated would be dependant on which season the construction takes place in, and the prevailing wind direction.
- Disturbance to adjoining landowners: Construction activities and construction personnel on site, as well as construction vehicles moving to and from site would cause a disturbance to adjacent landowners, although the low residential density curtails the significance of any impact on surrounding landowners.
- Security risks: During the construction phase a substantial labour force would be employed on the site, and this may pose a security risk to the surrounding property / infrastructure owners and users. Moreover, criminal elements may use the anonymity afforded by the construction activities to carry out criminal activities in the areas surrounding the proposed development.
- Social impact on local communities: Increased numbers of workers, as well as increased amount of income in the area may have social consequences for the residents of the towns of Bethlehem and Clarens. The contractor will use local labour as and when required which will have a positive impact on the economy of the area. The temporary labourers will be trained in construction activities and this will increase the skill base of the community. The injection of money into the area, although aiding community needs may cause related social impacts such as theft and prostitution and the subsequent spread of HIV/AIDS, increased alcohol abuse, violence and crime.

### Cumulative impacts :

- Impact on terrestrial flora: Disturbances during construction could lead to colonisation by exotic invasive species. Colonisation of these invasive species will impact negatively on regional plant biodiversity as well as ecosystem integrity. The area to be excavated has already been disturbed due to agriculture and the construction of the Boston A Dam Weir.

### Alternative A2 N/A

Direct Impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

### Alternative A3 N/A

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

### No-go alternative (compulsory)

Direct impacts:

The no go option will result in no generation of "green" energy and thus alternative energy sources (e.g. coal fired power stations) will need to be investigated. The social impact on local communities (i.e. temporary job creation and increase in skill base of the community) will also be negatively impacted upon.

Indirect impacts: N/A

Cumulative impacts: N/A



## BASIC ASSESSMENT REPORT

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative A1:	Alternative A2:	Alternative A3:
<p><b>Visual Impact:</b> The development and implementation of an appropriate EMP (attached as Appendix G2 and Appendix C2) during the construction phase would serve to curtail any negative impacts on the visual aesthetics by ensuring the appropriate rehabilitation of disturbed areas after completion of construction. The construction period should be as short as possible and appropriately managed. Stockpiles should be no higher than two meters and should be covered to minimise erosion, dust generation and unsightly aesthetics.</p> <p><b>Windblown Dust:</b> Dust control measures should be implemented through the attached EMP (Appendix G2) and the extent of the disturbed area reduced. Appropriate dust suppression measures, e.g. dampening with water, should be used when dust generation is unavoidable, particularly during prolonged periods of dry weather in summer. In addition, areas stripped should be minimised and phased to limit soil exposure. To combat dust generation and prevent erosion, re-vegetation should occur incrementally immediately upon completion of the construction activities at the subject location. Adhering to these mitigation measures will ensure that the impact is of low significance.</p> <p><b>Ambient noise levels:</b> Impacts on noise generation during construction in general should be mitigated by ensuring that all regulations relating to noise generation are observed and by restricting work to normal working hours. All machines should be equipped with appropriate noise reduction equipment and all vehicles should be roadworthy (including meeting maximum noise specifications). Refer to Appendix G1.</p> <p><b>Litter / waste production:</b> Hazardous substances, e.g. diesel, oil, etc. shall be stored in dedicated areas developed to minimise the impact of spills. Applicable statutory requirements will be adhered to in terms of requirements for safe storage. All storage areas, spillage containment areas, containers of hazardous substances and dangerous equipment shall be clearly and prominently marked as such. Refuse and waste from the construction activities will not be disposed of on site, but will be removed to a registered waste dump by the contractor. The provision of suitable refuse disposal facilities and the effective implementation of the EMP (Appendix G) could readily manage this potential impact.</p> <p><b>Terrestrial flora:</b> The attached EMP (Appendix G2) will be implemented to minimise the area of disturbance. The corridor of disturbance should be re-vegetated soon after construction. All the areas disturbed during construction work will be rehabilitated with indigenous species occurring in the area to a standard similar or better than before on completion of the works.</p>	<p>N/A</p>	<p>N/A</p>

## BASIC ASSESSMENT REPORT

<p><u>Terrestrial fauna:</u> Given their inherent mobility, all fauna within the study area should be able to move away from the construction zone, to undisturbed land in the vicinity. As a result, the impact of construction on fauna would be considered of low significance and no mitigation is required.</p> <p><u>Aquatic ecosystem:</u> The impact on the ecology of the aquatic habitat will be very low / negligible.</p> <p><u>Erosion:</u> The design of the temporary and permanent works shall include measures to prevent erosion resulting from concentration or increase in flow of stormwater caused by the presence of the works. Such measures shall include properly constructed watercourses and energy dissipaters to counter erosion and avoid discharges into agricultural lands or wetlands. Stockpiles shall be established only in demarcated areas and shall be well managed and maintained. No stockpiles will be established close to embankments or other slopes. Stockpiled materials shall not be allowed to spill into undisturbed areas or watercourses.</p> <p><u>Sedimentation:</u> Relatively little of the site would need to be cleared during construction, and accordingly relatively little sedimentation should occur. Where possible, construction activities should be scheduled to occur outside of the rainy season, thereby reducing the anticipated volume of runoff during construction. In addition, sediment traps and barriers would be employed where appropriate.</p> <p><u>Loss of topsoil:</u> Where possible, topsoil shall be removed approximately 250mm deep from all un-vegetated areas. It will be salvaged from all the areas to be used during construction and will be stockpiled for use during re-vegetation and landscaping.</p> <p><u>Traffic:</u> Impacts on traffic flow during construction should be further mitigated by ensuring that all regulations relating to traffic management are observed and by notifying the local traffic officials of the construction activities. Adequate and appropriate traffic warning signage and appropriate speed limits for construction vehicles should be adhered to.</p> <p><u>Water quality:</u> Careful management of the site and education of all construction staff would curtail the risk of pollution spills. The probability of this impact occurring could be further reduced via the implementation of the attached EMP (Appendix G2).</p> <p><u>Employment opportunities:</u> Members of the community could be employed as part of the labour force. No mitigation required.</p> <p><u>Disturbance to landowners:</u> The probability of this impact occurring could be further reduced via the implementation of an appropriate EMP and careful management of activities on site.</p> <p><u>Security risks:</u> The contractor should mitigate any security risks by closely monitoring his site personnel and their activities. The residents in the area can mitigate security risks by increased vigilance. Construction workers should be easily identifiable in a</p>		
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## BASIC ASSESSMENT REPORT

<p>uniform.</p> <p><b>Social impacts:</b> The contractor should implement awareness campaigns, such as HIV/AIDS education to inform employees of the social and health implications of their actions. Local labour should be used as far as possible during the construction of the proposed development. The local people should be informed appropriately about how this process will unfold. The contractor must ensure that signs indicating the availability / unavailability of jobs are and that the process of hiring local labour is managed correctly to prevent conflict situations and to manage the likely influx of causal labour seekers.</p>		
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#### 4. IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

List the potential site alternative related impacts (as appropriate) that are likely to occur as a result of the operational phase:

##### Alternative S1 (preferred alternative)

##### Direct impacts:

- **Visual impact of infrastructure:** Depending on the final design, the aesthetic of the Hydro Power Plant could have a visual impact in the area. The rural setting would be aesthetically altered by the proposed development of the scheme. The visual effects will be mitigated by means of altered design in order to reduce the height of the top structure. Various other design and construction factors will be taken into account in order to minimise the visual effects. (See appendix C2 for a visual representation from various angles)
- **Impact on terrestrial flora:** The impact on the terrestrial flora and habitat will be very low / negligible.
- **Impact on terrestrial fauna:** The impact on terrestrial fauna will be very low / negligible.
- **Impact on aquatic ecosystem:** Due to the highly disturbed states of the river, this impact is of low significance.
- **Erosion:** The increased velocity associated with the works at times could increase the velocity of the water flowing through the system, and this may lead to downstream erosion of the river channel, channel narrowing or incision and subsequent increased downstream sedimentation. This sedimentation could potentially result in geomorphic changes to the riverine environment, changes in ecosystem function, a loss of certain habitats and bed armouring. Once water has passed through the turbines at the Hydro Power Plant, the water will be reintroduced to the river, via a spillway. There is the potential for erosion to occur at this point, and resultant deterioration of or removal of material from the stream banks. The positive impact of the river diversion is the removal of the high velocity water mass, which will lead to less erosion.
- **Impact of O<sub>2</sub> level change:** Once water has passed through the Hydro Power Plant, it would be reintroduced into the river at a spillway. Turbulence at the spillway could result in agitation / aeration of the water, with more dissolved oxygen being present in the water. This could impact on the downstream environment affecting aquatic organisms present in the reach.
- **Socio-economic impacts / poverty alleviation:** The Hydro Power Plant could supply power at a competitive tariff compared to current rates charged for electricity by current service providers. The savings to the Local Authority from reduced power cost could boost their budget and contribute to the delivery of other basic services. In addition the implementation of the project could result in a large amount of foreign investment in the region. Approximately three full-time job opportunities would be created.

**Indirect impacts:** N/A

##### Cumulative impacts:

**Reduction of Carbon Dioxide emissions:** Due to the fact that hydropower is a clean process and does not result in production and release of Carbon dioxide into the environment, the Hydro Power

## BASIC ASSESSMENT REPORT

Plant has the potential to reduce South Africa's Carbon dioxide emissions considerably.

**Alternative S2 N/A**

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

**Alternative S3 N/A**

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

**No-go alternative (compulsory)**

Direct impacts:

The no go option will result in no generation of "green" energy and thus alternative energy sources (e.g. coal fired power stations) will need to be investigated. The social impact on local communities (i.e. temporary job creation and increase in skill base of the community) will also be negatively impacted upon.

Indirect impacts: N/A

Cumulative impacts: N/A

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

**Alternative S1**

**Alternative S2**

**Alternative S3**

Visual impact of infrastructure: Sensitive siting and design of the infrastructure could mitigate this impact significantly. The power station could be designed to fit in with vernacular architecture and aesthetics of the area. The scheme and associated works can be placed and designed in such a manner as to minimize the impacts on the new housing development.

Impact on terrestrial fauna: The operation of the Hydro Power Plant would not impact on terrestrial fauna significantly due to their inherent mobility and the highly disturbed nature of the site.

Impact on aquatic ecosystem: The low chance for survival for fish in the river ecosystem mitigates this issue.

Erosion: This impact can be mitigated by protection of the stream banks against erosion as well as sensitive design of the outlet structure i.e. spillway so as to reduce the velocity of the water re-entering the system. Measures to control velocities and flows should be agreed to and implemented as part of the operational EMP.

Sedimentation at infrastructure: The strong flow of the water mitigates the impact naturally.

N/A

N/A



## BASIC ASSESSMENT REPORT

<p><u>Impact on recreational potential of river:</u> It is recommended that the design of the weir / dam wall and intake structures accommodate the movement of canoeists.</p> <p><u>Impact of O<sub>2</sub> level change:</u> No mitigation required.</p> <p><u>Impact on flow variation:</u> This diverted section is very short compared to the overall length of the river, and due to the overall disturbances caused to the river flow regime due to the Lesotho Highlands Water Project (LHWP), mitigation options are rather limited.</p> <p><u>Socio-economic impacts / poverty alleviation:</u> No mitigation required.</p> <p><u>Reduction of Carbon dioxide emissions:</u> No mitigation required as this impact is of high positive impact.</p>		
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List the potential activity/technology alternative related impacts (as appropriate) that are likely to occur as a result of the operational phase:

**Alternative A1 (preferred alternative)**

**Direct impacts:**

- Visual impact of infrastructure: Depending on the final design, the aesthetic of the Hydro Power Plant could have a visual impact in the area. The rural setting would be aesthetically altered by the proposed development of the scheme. The visual impact will be mitigated in such a manner as to minimize the negative effect as far as possible.
- Impact on terrestrial flora: Vegetation plays an important role in the functioning of ecosystems as well as playing a vital role in maintaining biological processes in the soil. The removal of existing vegetation will result in a disruption of normal ecological functions. No plant species of conservation importance were identified during the site visit. Disturbances during construction will lead to colonisation by exotic invasive species.
- Impact on terrestrial fauna: Habitat loss is the lead cause of species loss around the world, however, the impacts would be restricted to the disturbance of the footprint. Given their inherent mobility, all fauna within the study area should be able to move away to undisturbed land in the vicinity.
- Impact on aquatic ecosystem: Due to the highly disturbed states of the river, this impact is of low significance.
- Erosion: The increased velocity associated with the works at times could increase the velocity of the water flowing through the system, and this may lead to downstream erosion of the river channel, channel narrowing or incision and subsequent increased downstream sedimentation. This sedimentation could potentially result in geomorphic changes to the riverine environment, changes in ecosystem function, a loss of certain habitats and bed armouring. Once water has passed through the turbines at the Hydro Power Plant, the water will be reintroduced to the river, via a spillway. There is the potential for erosion to occur at this point, and resultant deterioration of or removal of material from the stream banks. The positive impact of the river diversion is the removal of the high velocity water mass, which will lead to less erosion.
- Sedimentation at infrastructure: Sediments could collect behind a dam wall, weir or intake structure as they represent a physical barrier. This build-up could vary based on the ability of a river to "flush" the sediments past the obstruction, natural conditions and the upstream tributaries / conditions. Armouring could occur, as a result of sedimentation, in addition the downstream habitat conditions can alter due to the lack of organic and inorganic nutrients being provided by the sediments. Sediment build up could also cause "nutrient loading" in the water and could cause the supply of oxygen to be depleted with concomitant effects on living organisms in the reach.
- Impact on recreational potential of river: The presence of weir / dam wall and intake structures

## BASIC ASSESSMENT REPORT

as well as fluctuations in flow could prevent use of the river for boating or rafting purposes. The infrastructure could be an obstruction to movement, and low flow scenario could be so severe that there is not enough water in the river to allow canoes to pass. However, it is believed the official rafting route ends before the location of the weir.

- **Impact of O<sub>2</sub> level change:** Once water has passed through the Hydro Power Plant, it would be reintroduced into the river at a spillway. Turbulence at the spillway could result in agitation / aeration of the water, with more dissolved oxygen being present in the water. This could impact on the downstream environment affecting aquatic organisms present in the reach.
- **Impact on flow variation:** During diversion of a section of the river, the flow variation would be altered. This will cause a change in microhabitat for invertebrates and affect the marginal vegetation.
- **Socio-economic impacts / poverty alleviation:** The Hydro Power Plant could supply power at a competitive tariff compared to current rates charged for electricity by current service providers. The savings to the Local Authority from reduced power cost could boost their budget and contribute to the delivery of other basic services. In addition the implementation of the project could result in a large amount of foreign investment in the region. Approximately three full-time job opportunities would be created.

**Indirect impacts:** N/A

**Cumulative impacts:**

- **Impact on terrestrial flora:** Disturbances during construction will lead to colonisation by exotic invasive species. Colonisation of these invasive species will impact negatively on regional plant biodiversity as well as ecosystem integrity. The area to be excavated has already been disturbed due to agriculture and the construction of the Boston A Dam Weir.
- **Reduction of Carbon Dioxide emissions:** Due to the fact that hydropower is a clean process and does not result in production and release of Carbon dioxide into the environment, the Hydro Power Plant has the potential to reduce South Africa's Carbon dioxide emissions considerably.

**Alternative A2** N/A

**Direct impacts:** N/A

**Indirect impacts:** N/A

**Cumulative impacts:** N/A

**Alternative A3** N/A

**Direct impacts:** N/A

**Indirect impacts:** N/A

**Cumulative impacts:** N/A

**No-go alternative (compulsory)**

**Direct impacts:**

The no go option will result in no generation of "green" energy and thus alternative energy sources (e.g. coal fired power stations) will need to be investigated. The social impact on local communities (i.e. temporary job creation and increase in skill base of the community) will also be negatively impacted upon.

**Indirect impacts:** N/A

**Cumulative impacts:** N/A

## BASIC ASSESSMENT REPORT

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative A1	Alternative A2	Alternative A3
<p><u>Visual impact of infrastructure:</u> Sensitive siting and design of the infrastructure could mitigate this impact significantly. The power station could be designed to fit in with vernacular architecture and aesthetics of the area. The scheme and associated works are shielded from view from the new residential development area.</p> <p><u>Impact on terrestrial flora:</u> An invasive species removal programme will aid in reducing the impact, however the impact remains significant.</p> <p><u>Impact on terrestrial fauna:</u> The operation of the Hydro Power Plant would not impact on terrestrial fauna significantly due to their inherent mobility and the highly disturbed nature of the site.</p> <p><u>Impact on aquatic ecosystem:</u> The low chance for survival for fish in the river ecosystem mitigates this issue.</p> <p><u>Erosion:</u> This impact can be mitigated by protection of the stream banks against erosion as well as sensitive design of the outlet structure i.e. spillway so as to reduce the velocity of the water re-entering the system. Measures to control velocities and flows should be agreed to and implemented as part of the operational EMP.</p> <p><u>Sedimentation at infrastructure:</u> The strong flow of the water mitigates the impact naturally.</p> <p><u>Impact on recreational potential of river:</u> It is recommended that the design of the weir / dam wall and intake structures accommodate the movement of canoeists.</p> <p><u>Impact of O<sub>2</sub> level change:</u> No mitigation required.</p> <p><u>Impact on flow variation:</u> This diverted section is very short compared to the overall length of the river, and due to the overall disturbances caused to the river flow regime due to the Lesotho Highlands Water Project (LHWP), mitigation options are rather limited.</p> <p><u>Socio-economic impacts / poverty alleviation:</u> No mitigation required.</p> <p><u>Reduction of Carbon dioxide emissions:</u> No mitigation required as this impact is of high positive impact.</p>	<p>N/A</p>	<p>N/A</p>

### 5. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING AND CLOSURE PHASE

List the potential site alternative related impacts (as appropriate) that are likely to occur as a result of the decommissioning or closure phase:

**Alternative S1 (preferred alternative)**

**Direct impacts:**



## BASIC ASSESSMENT REPORT

It is not anticipated that the proposed Hydro Power Plant will be decommissioned. Should it be the case at a later stage, a decommissioning EMP will be compiled.

Indirect impacts: N/A

Cumulative impacts: N/A

### Alternative S2 N/A

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

### Alternative S3 N/A

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

### No-go alternative (compulsory)

Direct impacts:

The no go option will result in no generation of "green" energy and thus alternative energy sources (e.g. coal fired power stations) will need to be investigated. The social impact on local communities (i.e. temporary job creation and increase in skill base of the community) will also be negatively impacted upon.

Indirect impacts: N/A

Cumulative impacts: N/A

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative S1

Alternative S2

Alternative S3

N/A

N/A

N/A

List the potential activity/technology alternative related impacts (as appropriate) that are likely to occur as a result of the decommissioning and closure phase:

### Alternative A1 (preferred alternative)

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

### Alternative A2

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

### Alternative A3

Direct impacts: N/A

Indirect impacts: N/A

Cumulative impacts: N/A

## BASIC ASSESSMENT REPORT

**No-go alternative (compulsory)**

**Direct impacts:**

The no go option will result in no generation of "green" energy and thus alternative energy sources (e.g. coal fired power stations) will need to be investigated. The social impact on local communities (i.e. temporary job creation and increase in skill base of the community) will also be negatively impacted upon.

**Indirect impacts:** N/A

**Cumulative impacts:** N/A

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative A1	Alternative A2	Alternative A3
N/A	N/A	N/A

### 6. PROPOSED MANAGEMENT OF IMPACTS AND MITIGATION

Indicate how identified impacts and mitigation will be monitored and/or audited.

Alternative S1	Alternative S2	Alternative S3
Refer to Appendix G2 for the EMP	N/A	N/A

Alternative A1	Alternative A2	Alternative A3
N/A	N/A	N/A

### 7. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

**Alternative S1 (preferred alternative)**

This Report has assessed the potential impacts associated with the proposed Hydro Power Plant construction. This investigation has not identified any potential impacts on the environment, which are so severe as to suggest that the proposed infrastructure should not be approved.

The proposed development is aimed at enhancing / augmenting the electricity supply to nearby Clarens. The expected long term effects on the environment is mostly positive, while the short term negative effects of construction activities of has limited impact on the environment, and with the implementation of the recommendations contained in this report, could be managed and minimised.

An Environmental Control Officer (ECO) will be appointed for the construction period. The ECO would conduct regular monitoring to ensure compliance with the Environmental Management Plan (EMP) (Attached in Appendix G2), and keep records of such monitoring. These monitoring records will be made available to the Site Engineer for record and action as required.

Considering the present environmental conditions, the assessment of the environmental issues, and the recommendations contained in this report, it is believed that the Environmental Assessment could be completed at this Basic Assessment Stage, and that no further assessment is required.

**Alternative S2**

N/A
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**Alternative S3**

N/A
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# BASIC ASSESSMENT REPORT

## Alternative A1 (preferred alternative)

N/A

## Alternative A2

N/A

## Alternative A3

N/A

## No-go alternative (compulsory)

The no go option will result in no generation of "green" energy and thus alternative energy sources (e.g. coal fired power stations) will need to be investigated. The social impact on local communities (i.e. temporary job creation and increase in skill base of the community) will also be negatively impacted upon.

## 8. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner).

YES	NO
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If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

N/A

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

The following recommendations are considered professional opinions and are based on experience in the field, knowledge of the local environment, and are informed by comments received during the course of the Basic Assessment process. The recommendations can be separated into the following groups:

- Construction recommendations; and
- Operational and maintenance recommendations

### Construction recommendations

- It is recommended that the mitigation measures detailed in the report be implemented in order to reduce the significance of the impacts associated with the construction of the proposed hydropower scheme.
- In order to manage construction and limit the significance of impacts mentioned in Section 4, an EMP was developed. It is crucial that the implementation of the EMP is enforced by an Environmental Control Officer during construction, and that the environmental conditions, costs and penalties are written onto the contract documentation
- In particular, it is recommended that disturbed areas should be rehabilitated and re-vegetated with suitable vegetation.

### Operational and maintenance recommendations

- Develop and implement an operational Environmental Management System (EMS), with appropriate guidelines for the optimal operation of the plant and a contingency plan to deal with upset operating conditions and emergency situations (e.g. flooding, mechanical failure) should they arise. The EMP incorporates appropriate monitoring protocols and makes adequate provision for appropriate action in the event of potentially significant thresholds being reached or trends indicating potentially significant adverse impacts be noted.
- Related to the aforementioned EMP, ensure the continued implementation of a monitoring programme.
- Ensure that the plant operators have been properly trained in the operation of the works.

## SECTION F: APPENDICES

The following appendices must be attached as appropriate:

Appendix A1: General Locality Map of the Botterkloof Hydro Power Plant (1:50000)

Appendix A2: Detailed Locality Map of the Botterkloof Hydro Power Plant (1:15000)

Appendix A3: Layout Map of Botterkloof Hydro Power Plant

Appendix A4: Servitude Data for farm Botterkloof 541

Appendix B: Photographic Report

Appendix C1: Facility Illustration

Appendix C2: Visual Representation of the Mini Hydro

Appendix D: Specialist Reports – **Not applicable for this report**

Appendix E1: Proof of Site Notice

Appendix E2: Background Information Document

Appendix E3: Written notices to stakeholders

Appendix E4: Copy of the register of I&APs

Appendix E5: Proof of newspaper advertisements

Appendix E6: Proof of landowner consent

Appendix E7: Comments received from I&APs

Appendix E8: Comments and responses report

Appendix E9: Minutes of De Krantz Landowners Meeting

Appendix F1: Information in support of applications for exemption – Layout Map of Botterkloof Hydro Power Plant (Exemption Application)

Appendix F2: Information in support of applications for exemption – Correspondence received from I&APs

Appendix G1: Quantification of Noise Measurements (Noise Monitoring Report)

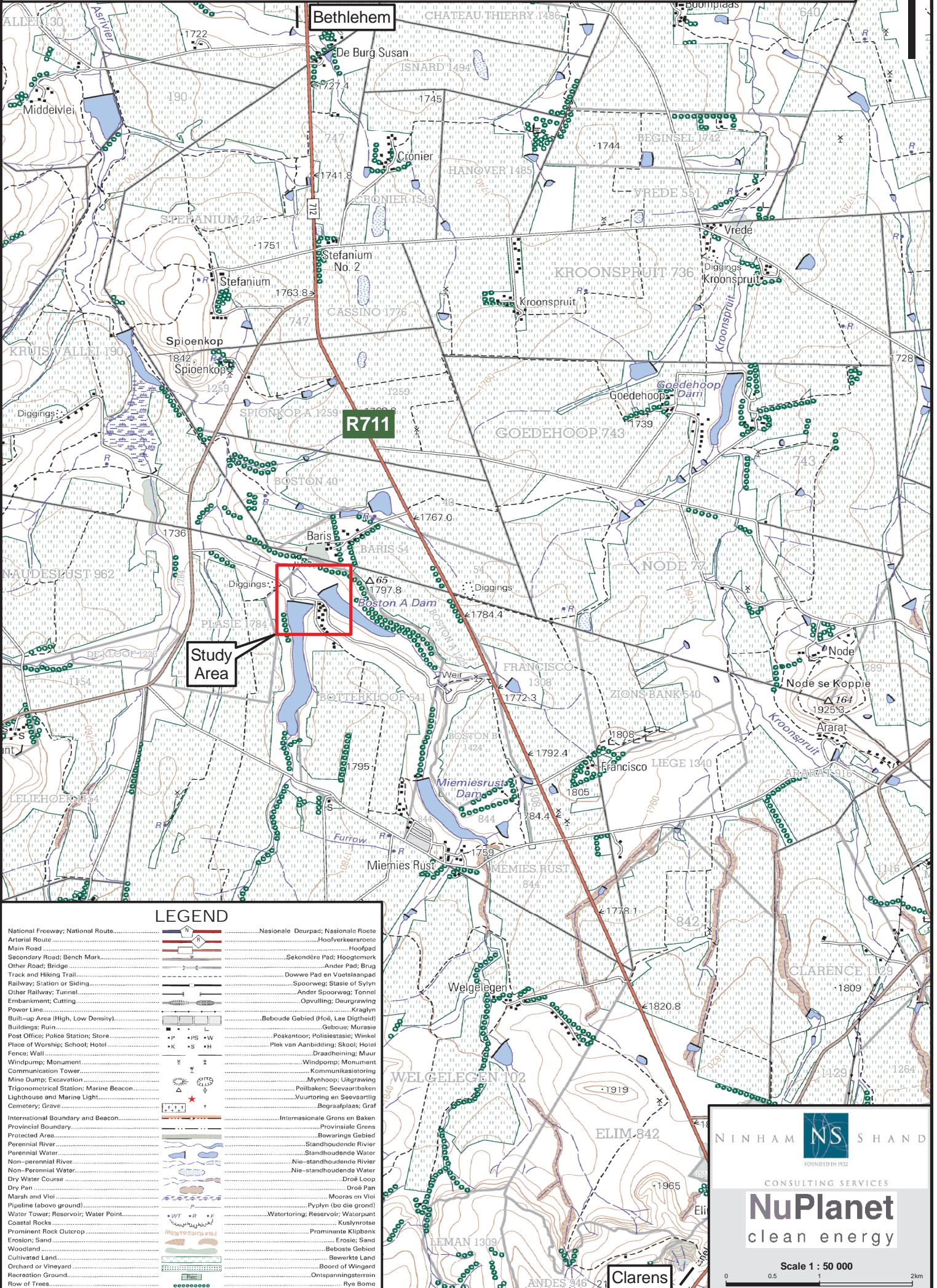
Appendix G2: EMP

## **APPENDIX A1**

# **GENERAL LOCALITY MAP OF THE BOTTERKLOOF HYDRO POWER PLANT (1:50 000)**



# General Locality Map of the Botterkloof Hydro Power Plant



NINHAM SHAND  
FOUNDED IN 1932

CONSULTING SERVICES

**NuPlanet**  
clean energy

Scale 1 : 50 000

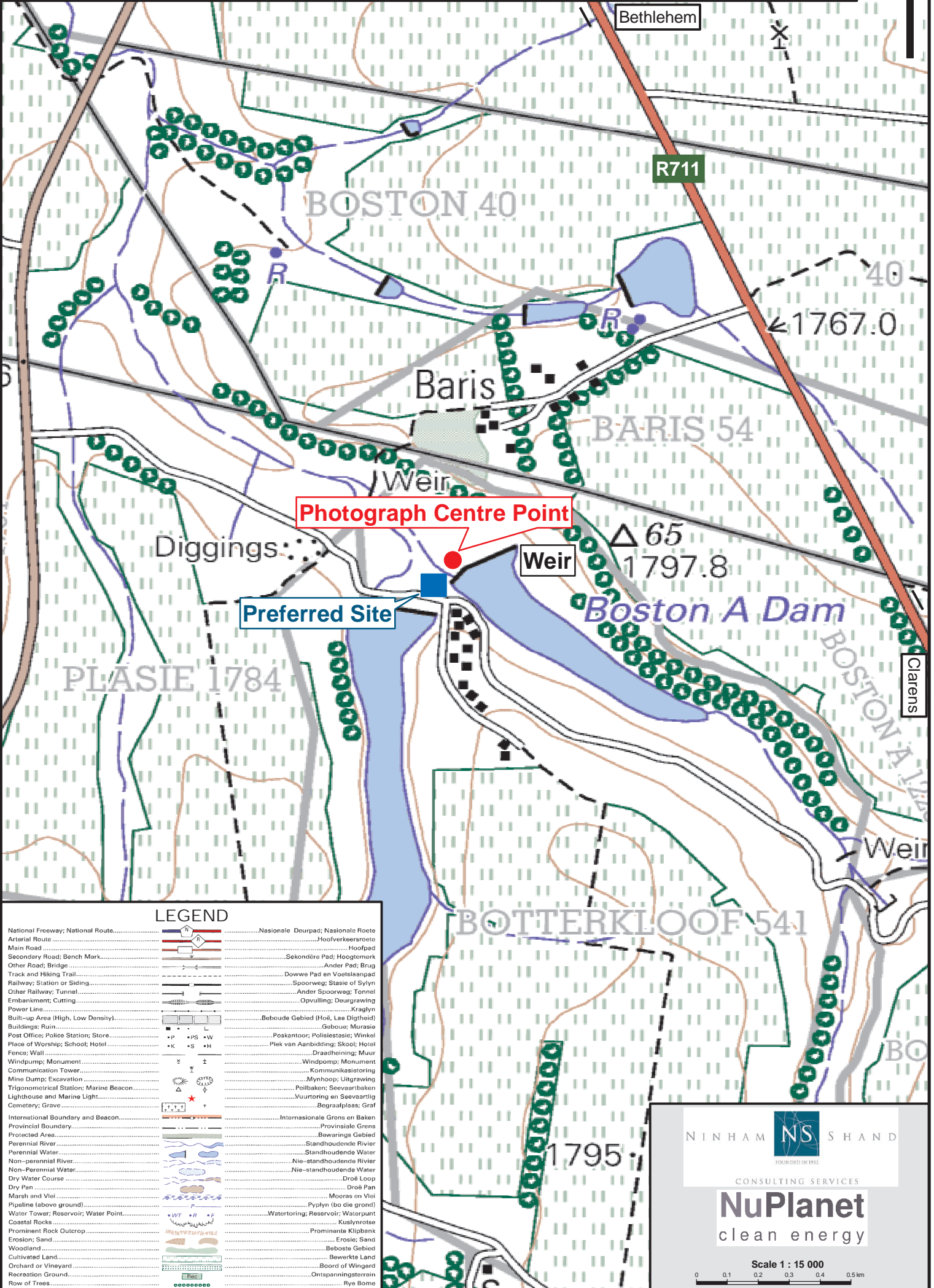
**APPENDIX A2**

**DETAILED LOCALITY MAP OF THE  
BOTTERKLOOF HYDRO POWER  
PLANT (1:15000)**



# Detailed Locality Map of the Botterkloof Hydro Power Plant

N



**Photograph Centre Point**

**Preferred Site**

Bethlehem

R711

BOSTON 40

Baris

BARIS 54

40

1767.0

△ 65  
1797.8

Weir

Boston A Dam

Diggings

PLASIE 1784

Clarens

Weir

BOTTERKLOOF 541

1795

## LEGEND

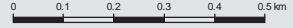
National Freeway; National Route.....	Nasionale Deurpad; Nasionale Roete
Arterial Route.....	Hooftverkeersroete
Main Road.....	Hooftpad
Secondary Road; Bench Mark.....	Sekondêre Pad; Hoogtemerk
Other Road; Bridge.....	Andere Pad; Brug
Track and Hiking Trail.....	Dorwe Pad en Voetslaanpad
Railway; Station or Siding.....	Spoorweg; Stasie of Slyn
Other Railway; Tunnel.....	Andere Spoorweg; Tunnel
Embankment; Cutting.....	Oprulling; Deurgrawing
Power Line.....	Kraglyn
Build-up Area (High, Low Density).....	Beboude Gebied (Hoë, Lae Digtheid)
Buildings; Ruin.....	Geboue; Mursie
Post Office; Police Station; Store.....	Poskantoor; Polisie-stasie; Winkel
Place of Worship; School; Hotel.....	Plek van Aanbidding; Skool; Hotel
Fence; Wall.....	Draadheining; Muur
Windpump; Monument.....	Windpomp; Monument
Communication Tower.....	Kommunikasietoring
Mine Dump; Excavation.....	Mynhoop; Uitgraving
Trigonometrical Station; Marine Beacon.....	Peilbakke; Seevaartbakke
Lighthouse and Marine Light.....	Vuurtoring en Seevaartlig
Cemetery; Grave.....	Begraafplaas; Graf
International Boundary and Beacon.....	Internasionale Grens en Baken
Provincial Boundary.....	Provinsiale Grens
Protected Area.....	Bewarings Gebied
Perennial River.....	Standhoudende Rivier
Non-perennial Water.....	Nie-standhoudende Water
Non-Perennial River.....	Nie-standhoudende Rivier
Dry Water Course.....	Droë Loop
Dry Pan.....	Droë Pan
Marsh and Vlei.....	Mooras en Vlei
Pipeline (above ground).....	Pyplyn (bo die grond)
Water Tower; Reservoir; Water Point.....	Watertoring; Reservoir; Waterpunt
Coastal Rocks.....	Kuslynnotes
Prominent Rock Outcrop.....	Prominente Klipbank
Erosion; Sand.....	Erosie; Sand
Woodland.....	Beboste Gebied
Cultivated Land.....	Bewerkte Land
Orchard or Vineyard.....	Boord of Wingerd
Recreation Ground.....	Ontspanningsterrein
Row of Trees.....	Rye Bome

NINHAM  SHAND  
FOUNDED IN 1952

CONSULTING SERVICES

**NuPlanet**  
clean energy

Scale 1 : 15 000



**APPENDIX A3**

**LAYOUT MAP OF BOTTERKLOOF  
HYDRO POWER PLANT**



# LAYOUT MAP OF BOTTERKLOOF HYDRO POWER PLANT

Bethlehem



R711

Photograph centre point

Weir

Preferred Site

Boston A Dam

Clarens



**APPENDIX A4**

**SERVITUDE DATA FOR FARM  
BOTTERKLOOF 541**

S.G. File No. 19011  
**SUBDIVISIONAL SURVEY.**  
 — FOR TRANSFER. —

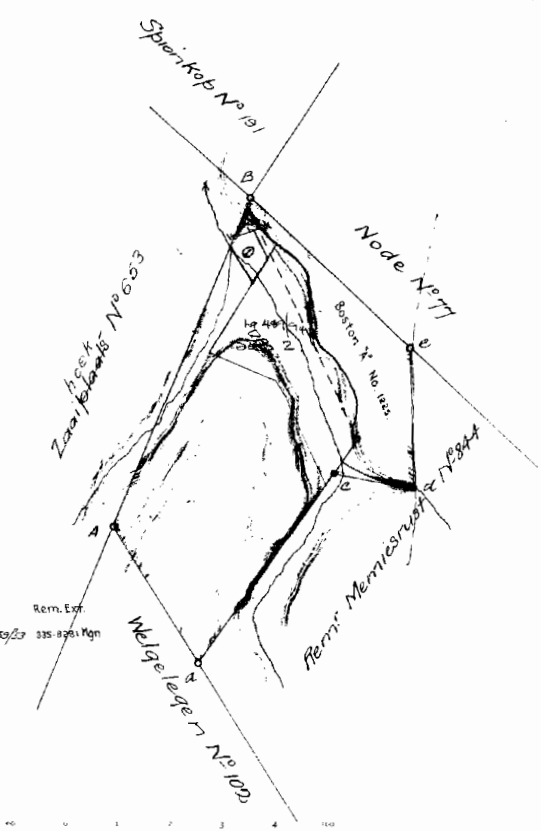


No. 730/V dated 12-12-12  
 Examined and Approved according to Ordinance No. 16, 1903.

Surveyor-General's Copy.

19541  
**BETHLEHEM.**

*E. A. H. Amundson*  
 12.12.12  
 Surveyor General.



This Diagram is attached to Deed of transfer No 4224 registered on 17/12/12 in the name of M. C. Eksjeen

**SUBDIVIDED.**  
 The following deductions have been made from this P.M.  
 Boston A 1225 Area 20 Acre 20 Acre T.D. 10/12/12  
 Sub 1 " 2 2586 11/11 " 2029/1905 S.A. No. 543/23 235-8761 Pgn



This farm is not subject to right of outspan. 12/12/12

	Angles		Sides.
A	125° 32' 50"	AB	671.34
B	69° 14' 30"	Be	418.40
e	132° 41' 50"	ed	261.26
d	77° 39' 40"	dc	154.74
c	245° 41' 00"	ca	141.53
a	67° 10' 10"	aA	305.40

The above Figure A B e d c a represents 423 morgen 293 rods situate in the District Bethlehem Ward Wittebergers being the Farm named **BOTTERKLOOF N° 541** being portion of the farm Memriesrust N° 844 owned by Johannes Gysbert Roos

	Coordinates	
	Y	X
A	0	+ 596.57
B	0	+ 1267.91
c	+ 391.24	+ 1119.62
d	+ 497.25	+ 880.83
e	+ 345.67	+ 843.72
a	+ 248.48	+ 419.02

DEDUCTED  
 - 2 JAN 1913  
 R.M.

Surveyed by me, November 1912  
 For transfer to M. C. Eksjeen  
*M. C. Eksjeen*  
 Government Land Surveyor.

GR-SD. BETHLEHEM 541.

The following is a list of the portions of the Boston A' 1225 Subdivision 1.

Portion Subdivision No.	Diagram No.	Tentative No.	Area.		Remaining Area.		Surveyor General. (sgd.)
			Mgn.	Sp. Rds.	Mgn.	Sp. Rds.	
Boston A' 1225		1119/20	84	421	338	472	W.P. Murray
Subdivision 1.	5459/53	2020/54	2-9586	Mgn.	335-8281	Mgn.	(Ind) D.J.J.K.

490/1934  
 1819/1934  
 166/067  
 ①

BAKENBESKRYWING

- I. K. 1 1/2" Gat in rots onder klipstapel.
- V. 18" x 1/2" Ysterpen & " "
- W. 1/2 Ysterpaal in klipstapel

SYE Kaapse Voet	RIGTINGS- HOEKE	KO-ORDINATE Stelsel L <sup>o</sup> 29 <sup>o</sup> (Ters.)	
		Y Konstant	X
		+190 000.0	+999 000.0
IK	632.6	290.35.0	I + 2119.5 + 489.0
KV	810.2	42.30.10	K + 1527.3 + 711.4
VI	820.9	176.52.11	V + 2074.7 + 1308.7
II"		356.52.11	
KK'		42.30.10	
VW	7079.2	356.52.11	W + 1688.1 + 8377.4

L.G. No. 5459/1953

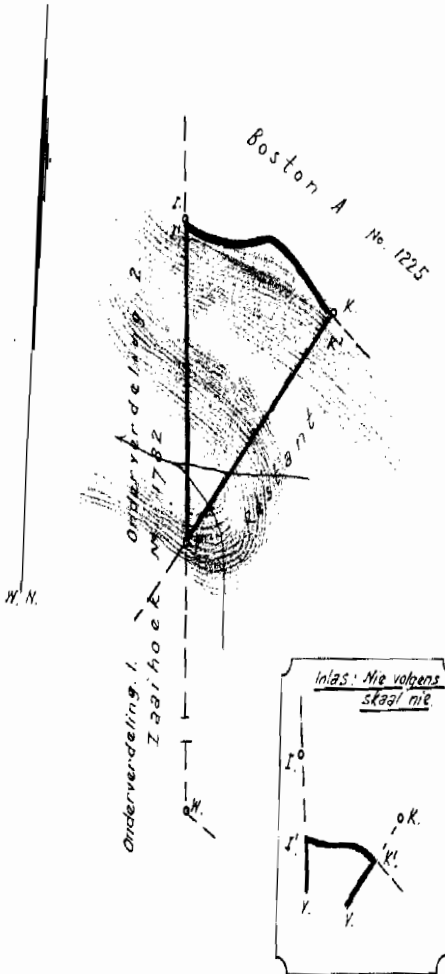
Goedgekeur

*P. Brink*  
Landmeter-generaal  
29-12-1953

**ANNULLED**

Die Sub. nommer is die Plaas No. 1784.  
Die Omslag No. 5469/1953 is die Omslag No. 5469/1953.  
Cons. 4/1953 tot 20/1/1954

*D. J. J. J.*  
1/5/1954



Nie onderhewig aan aansluit  
van Uitspanning etc.

— Skaal 1:5000 —

Die figuur I' top van Krans K' V.

stel voor 2.9586. Morge grond synde

Onderverdeling 1. van die plaas

— BOTTERKLOOF No. 541. —

geleë in Distrik — Bethlehem — Provinsie Oranje Vrystaat

Gemeet in September 1953. deur my *H. J. Dreyer*

Landmeter.

Hierdie kaart is geheg aan A.V.T.

No. 2020/1954 gedateer 28/4/54  
ten gunste van

Die oorspronklike kaart is

No. 730 J.  
geheg aan T.A. 4224/1912.

L.G. Omslag No. 1901/1  
Meestrukke No. 467/53  
Kompilasie Bethlehem I  
Landkaart Seksie  
Suider Breedte  
Ooster Lengte

Registrateur van Aktes.

4346.B.E.8/1/52.

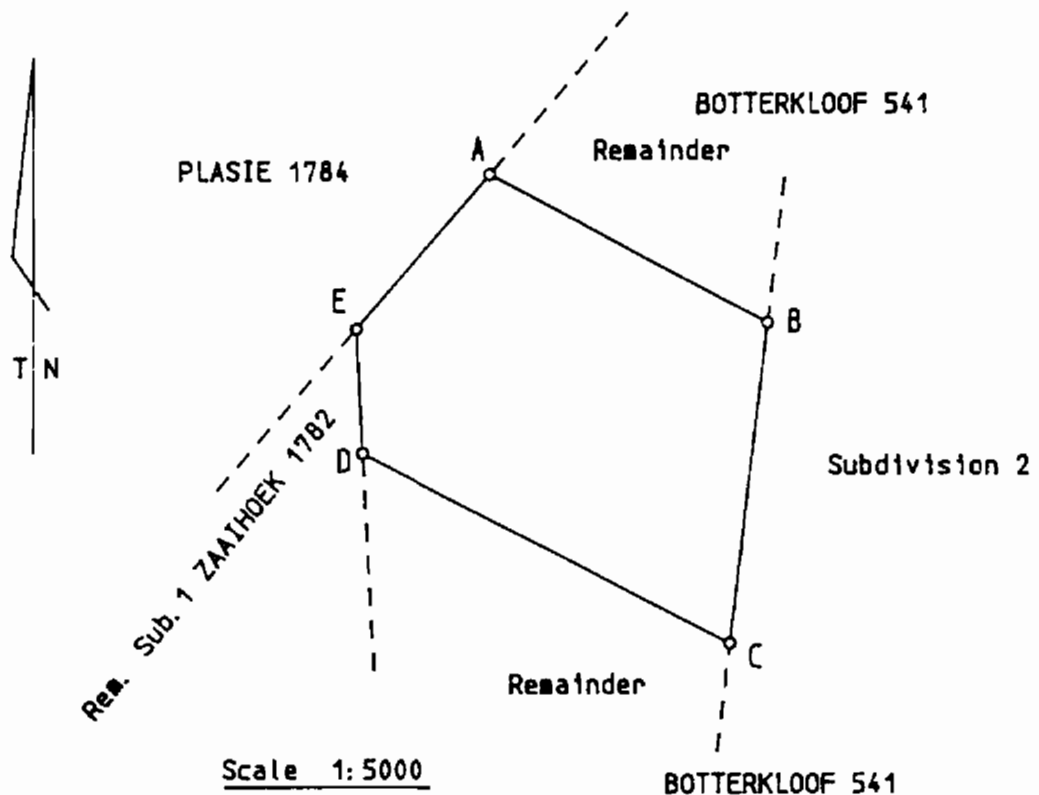
1/ BETHLEHEM 541.

SERVITUDE DIAGRAM

SIDES Metres		ANGLES OF DIRECTION		CO-ORDINATES Y System: L029° X		S. G. No. * 490/1994
		Constants:		±	0, 00	
AB	219, 46	296 39 00	A	+ 60 381, 86	+ 45 716, 72	Approved  <i>[Signature]</i> for SURVEYOR- GENERAL  1994-08-01
BC	213, 36	7 07 23	B	+ 60 185, 72	+ 45 815, 16	
CD	287, 93	115 53 20	C	+ 60 212, 18	+ 46 026, 87	
DE	81, 95	176 52 20	D	+ 60 471, 21	+ 45 901, 15	
EA	139, 03	222 26 20	E	+ 60 475, 68	+ 45 819, 33	
		Boston (65)	Δ	+ 59 716, 74	+ 45 882, 40	
		Hebron (74)	Δ	+ 64 640, 19	+ 43 171, 64	

Description of Beacons

A, B, C, D : Half iron standard  
E : 12mm iron peg



The figure **A B C D E**  
represents **5,5635 hectares** of land being  
a Servitude area on  
the remainder of the farm  
**BOTTERKLOOF 541**

Situate in Administrative District Bethlehem  
Province of Orange Free State  
Surveyed in January and February 1994

by us  
*[Signature]*  
R J Thomas and P R Barnard  
Professional Land Surveyors

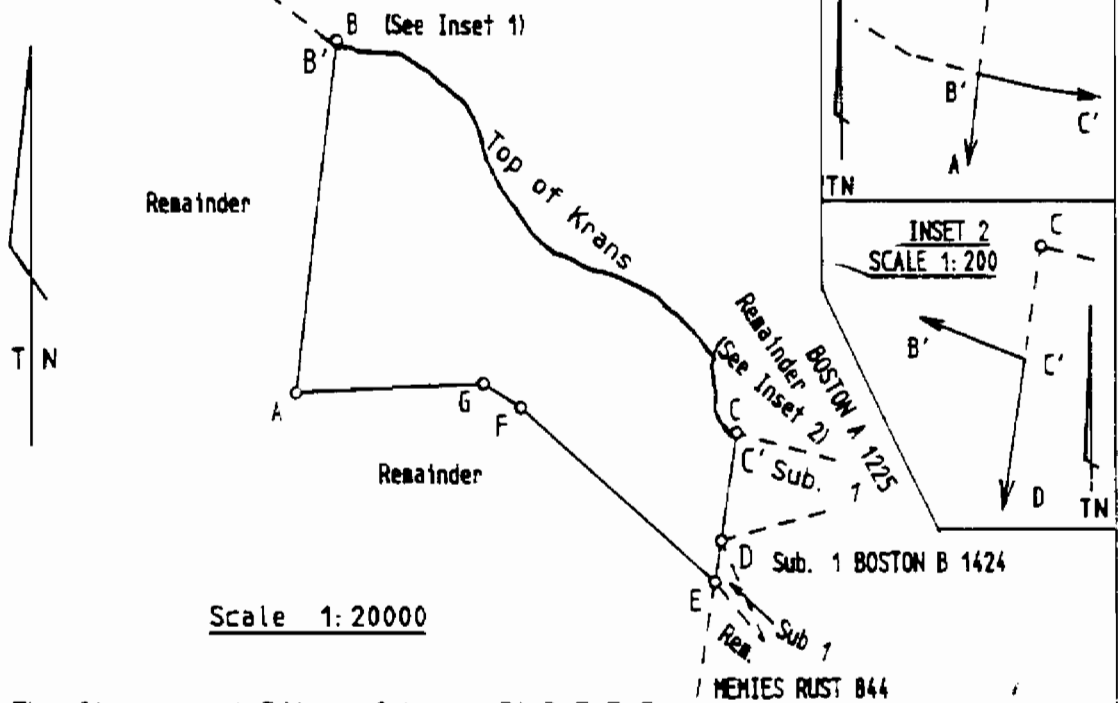
This diagram is annexed to No. d. d. i. f. o. Registrar of Deeds	The original diagram is S. G. No. 730/J/1912 Transfer 4224/1912 Grant	File S. R. 73/1994 Comp. GR-30 <b>STAATSOPMETING STATE SURVEY</b>
--	---	--



SIDES Metres		ANGLES OF DIRECTION		CO-ORDINATES Y System: L029° X		S. G. No. 489/1994
		Constants:		±	0, 00	+3100 000, 00
AB	926, 54	187 07 23	A	+ 60 287, 71	+ 46 631, 45	Approved  <i>[Signature]</i> for SURVEYOR- GENERAL  1994-08-01
BC	1512, 21	312 31 23	B	+ 60 172, 82	+ 45 712, 07	
CD	287, 34	8 45 50	C	+ 59 058, 31	+ 46 734, 15	
DE	108, 70	9 35 49	D	+ 59 102, 09	+ 47 018, 14	
EF	706, 52	130 21 02	E	+ 59 120, 21	+ 47 125, 32	
FG	122, 14	120 47 22	F	+ 59 658, 65	+ 46 667, 87	
GA	524, 78	87 09 00	G	+ 59 763, 58	+ 46 605, 35	
BB'		7 07 23				
CC'		8 45 50				
		Boston (65)	△	+ 59 716, 74	+ 45 882, 40	
		Hebron (74)	△	+ 64 640, 19	+ 43 171, 64	

**Description of Beacons**

- A, B, F, G : Round iron fence post in concrete
- C : 30mm hole in rock
- D : Stone corner fence post
- E : Half iron standard
- B', C' : No beacon



The figure A B' top of krans C' D E F G represents 75,7017 hectares of land being SUBDIVISION 2 of the farm BOTTERKLOOF 541

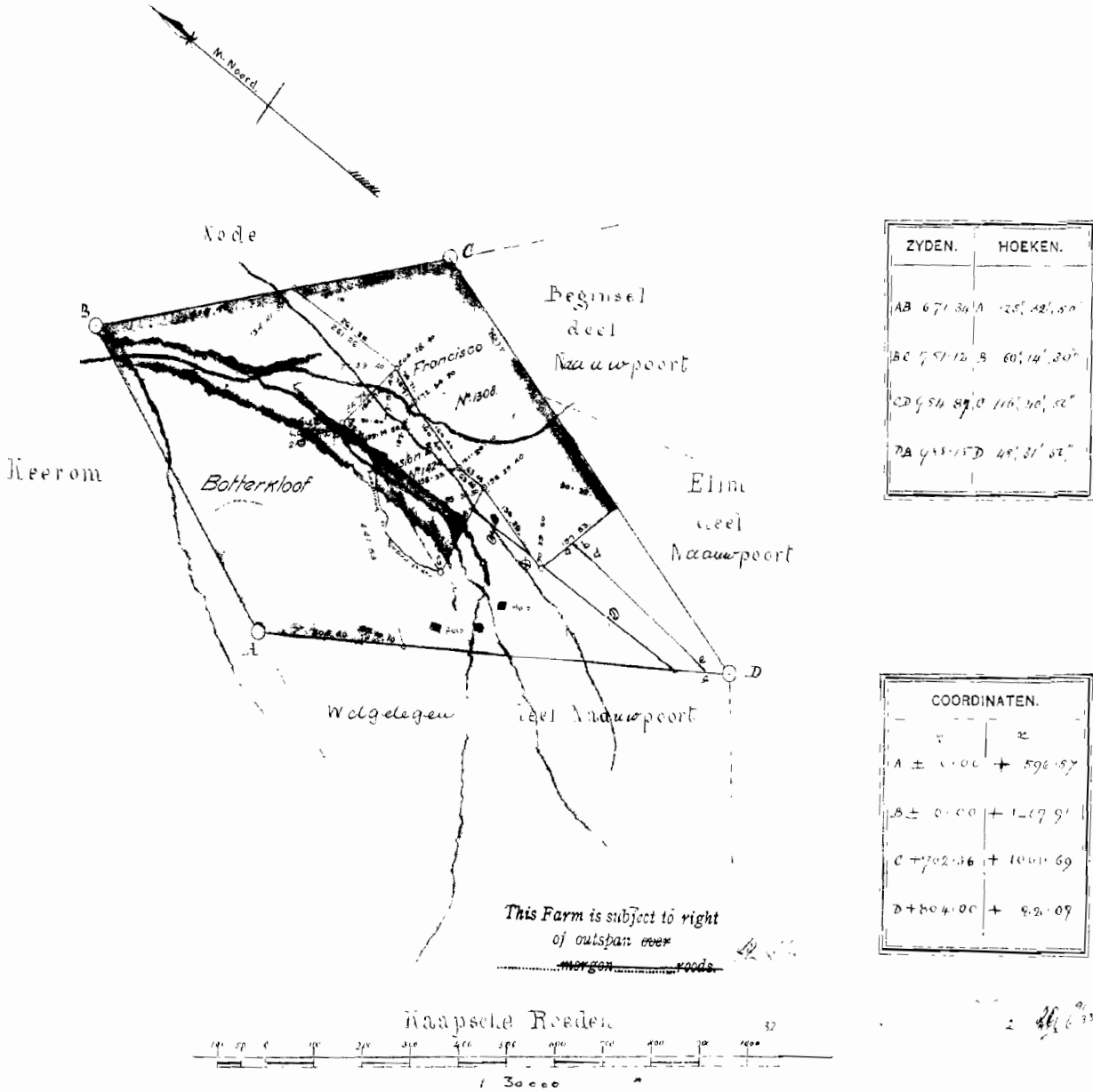
Situate in Administrative District : Bethlehem Province of Orange Free State Surveyed in January and February 1994

by us  
*[Signature]*  
R J Thomas and P R Barnard  
Professional Land Surveyors

This diagram is annexed to No. d. d. i. f. o. Registrar of Deeds	The original diagram is <del>S.G.</del> No. 730/J/1912 Transfer 4224/1912 Grant	File S.R. 73/1994 Comp. GR-3D <b>STAATSOPMETTING STATE SURVEY</b>
--	---	--

*J. Heek*  
Landm. Genl.

Surveyor-General's Copy.



Bovenstaande figuur A. B. C. D. stelt voor 1000 Morgen, 373½ Quid Roeden, van de Plaa.

Nieuwpoort No. 102 thans genaamd Memus Rust. 10844 gelegen in het district Bethlehem Wyk Wille Bergum Eigendom van Eduard Christiani Daniel Brouwer Senr volgens Transport Acten No° 9534 en 14760 Opgemeten volgens Ord 17830 1877

Gemeten en afgesneden door mij,

December 1890.

FOR DETAILS  
SEE  
BACK OF DIAGRAM.

*Chas. C. J. J. J.*  
Gouvernements Landmeter.

The following Subdivisions have been deducted from this Farm, viz:—

Name of Subdivision	No. and Date	Surveyed by	Area of Sub-division		Remaining Area of Original Farm		Name of Surveyor-General	Date
			Morgans	Sq. Rods	Morgans	Sq. Rods		
Butterkloof 541	730/12/12	Thomas	423	293	577	80 1/2	W. A. B.	
Francisco No 308		T Reid	242	482	242	392 1/2	T. D.	3963/20
Boston B 424			91	406				3962/20

THE FOLLOWING SERVITUDES HAVE BEEN REGISTERED

FIGURE LINE	DIAGRAM NO	DEED NO.	FOR SURVEYOR-GENERAL
a b d e f	508/1902	129 493	M. de Winter
①	1487/1994	1870/1000	K. H. White

**APPENDIX B**  
**PHOTOGRAPHIC REPORT**

**PHOTO REPORT**



**Photo 1:** View of the proposed site for the construction of the Hydro Power Plant (south west of the Boston A Dam).



**Photo 2:** View of the artificial wetlands which resulted from the flooding of a private dam on an adjacent farm. Existing infrastructure can be seen that runs south of where the Hydro Power Plant is to be constructed.



**Photo 3:** View of the outflow from the Boston A dam back into the Ash River as well as the 5 tonne bridge that crosses the Ash river.



**Photo 4:** The only bridge providing access to the site on the north eastern bank of the Ash River. This 5 tonne bridge would not be able to support heavy equipment, machinery and construction vehicles.



**PHOTO REPORT**



**Photo 5:** View of the disturbed area to the north east of the Ash River / Boston A Dam.



**Photo 6:** Private dam on adjacent farm overflowing the S217 dirt road.



**Photo 7:** Overflow of the private dam moving towards the rehabilitation and erosion prevention flora (*Vertiveria zizanoides*).



**Photo 8:** Vetiver grass forming a natural storm water berm.

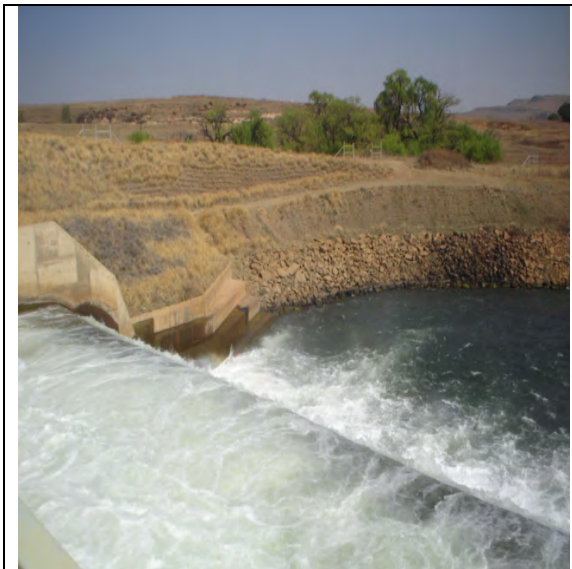
**PHOTO REPORT**



**Photo 9:** Use of granite rock and gabions for construction of a weir which in turn also prevents sedimentation load and erosion.



**Photo 10:** View of granite rock and gabions utilised for erosion protection.



**Photo 11:** Boston A Dam and proposed site for construction as seen from the north eastern side of the weir.



**Photo 12:** Narrow, 5 tonne bridge, indicating limited width.



**PHOTO REPORT**



**Photo 13:** Disturbed dam walls which were reinforced with heavy rockfill to prevent walls from collapsing.



**Photo 14:** Downstream view of the Ash river as seen from the north eastern side of the weir.



**Photo 15:** Existing infrastructure at Boston A Dam as seen from the north eastern side of the weir.



**Photo 16:** View of the private dam as well as Boston A Dam from an adjacent farm.

**PHOTO REPORT**



Photo 17: The proposed site for establishment of the Hydro Power Plant.



Photo 18: South western bank of the As River (preferred site).



Photo 19: Downstream view from Boston A Dam.



Photo 20: Rehabilitated and revegetated area, post construction of Boston A Dam.



**PHOTO REPORT**



Photo 21; Vetiver grass species planted during rehabilitation to assist in binding of soil particles.



Photo 22: Water release from the dam into the river.



Photo 23: Water outlets at weir indicating proposed location of penstock connections.



Photo 24: Private dam on adjacent farm.



**PHOTO REPORT**



Photo 25: New residential development on adjacent farm.



Photo 26: Another view of residential development, approximately 1.5km from the preferred site.



Photo 27: View of Boston A Dam weir from adjacent farm.



Photo 28: View of Boston A Dam weir from new residential development site.

**PHOTO REPORT**



Photo 29: Access dirt road S217 to the site which joins up with R711.



Photo 30: Access to Bavaria Conservancy which leads through to Boston A Dam and the preferred site.

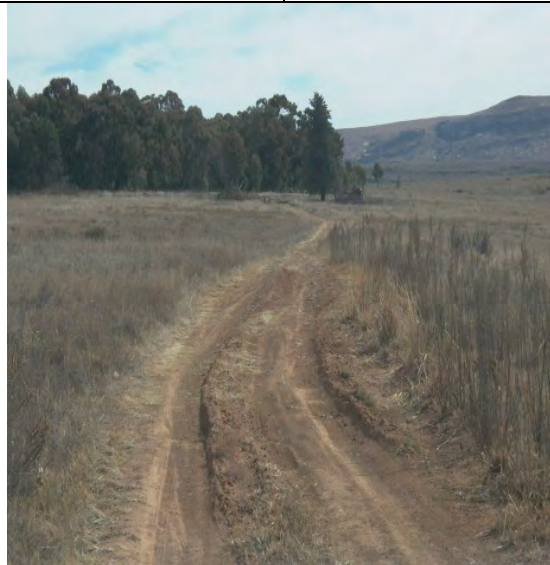


Photo 31: Access road within the Bavaria Conservancy.

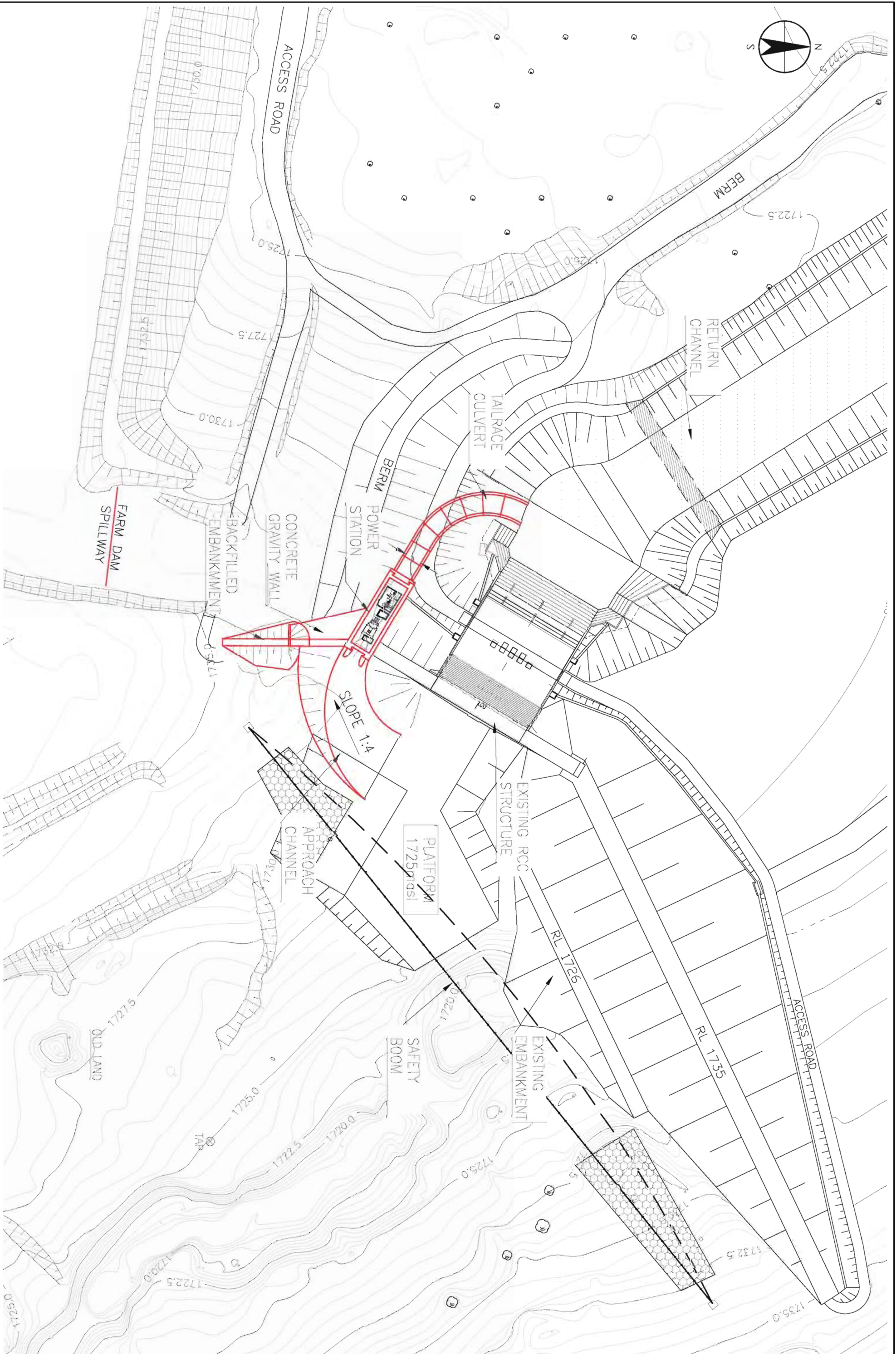
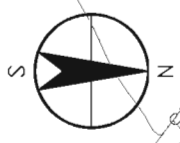
# **APPENDIX C1**

## **FACILITY ILLUSTRATION**









NO.	DATE	FOR ILLUSTRATION IN PROGRESS REPORT	DESCRIPTION	INITIALS	SIGN	DRAWING NO.	TITLE
0	29 FEB 08						

REVISIONS

REFERENCE DRAWINGS

NOTES

1. ALL PROVISIONS IN ALLIANCE WITH ENGINEERING STANDARDS AND PRACTICES SHALL BE OBSERVED.

2. ALL DIMENSIONS TO CENTER UNLESS OTHERWISE SPECIFIED.

DESIGNED BY	B. COLLET
CHECKED BY	P.A. BULMANE
APPROVED BY	P.A. BULMANE
CLIENT	A.I. OLIVER



**NU PLANET**

100/1000/10000

100/1000/10000

100/1000/10000

100/1000/10000

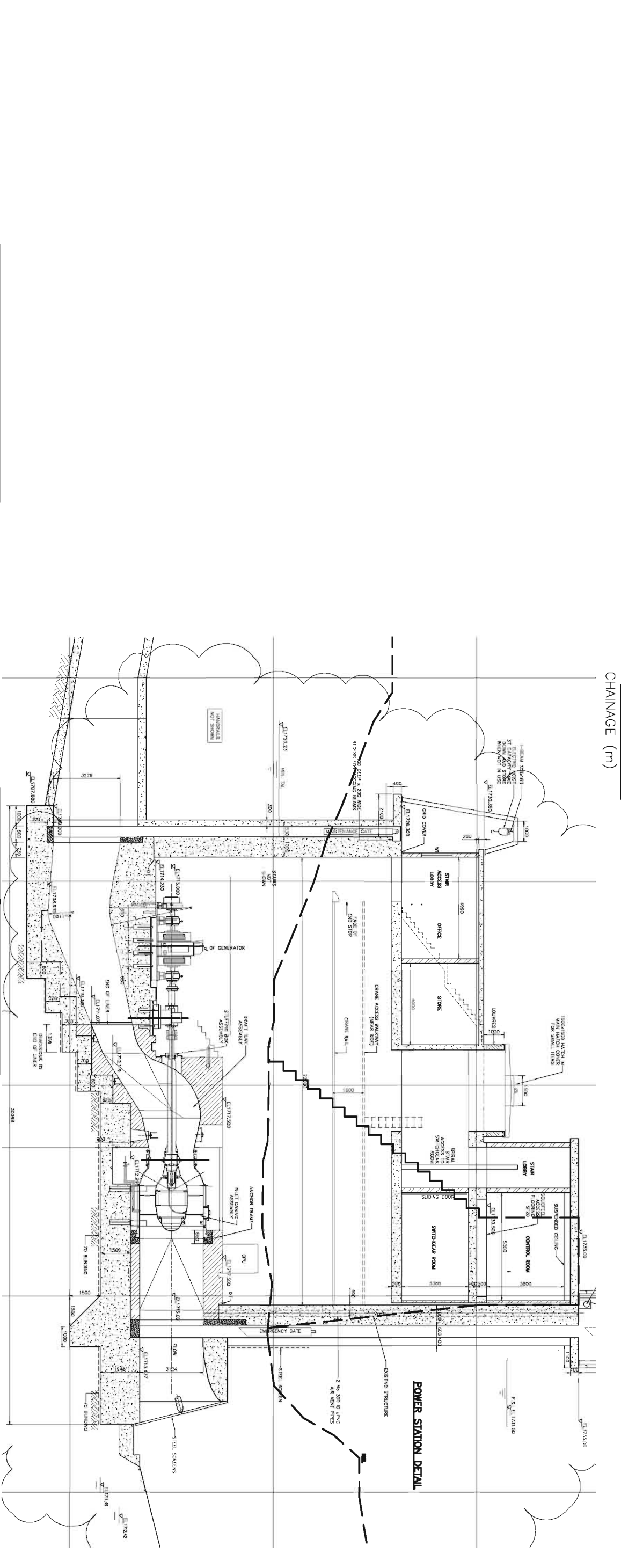
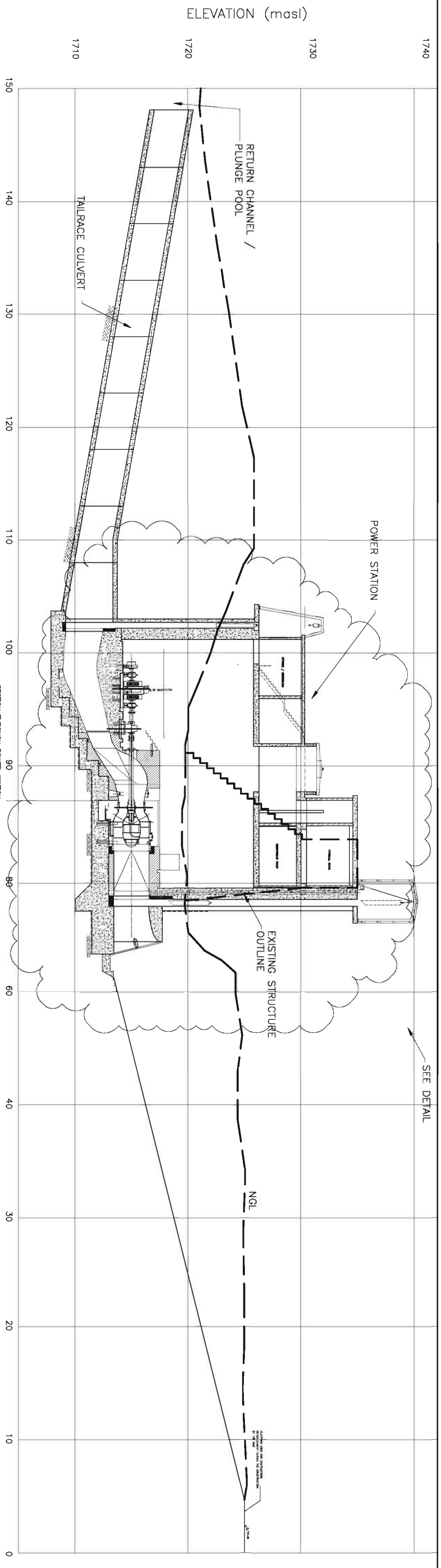
100/1000/10000

**BOTTERKLOOF MINI HYDRO**

**BOTTERKLOOF SITE - SITE PLAN**

SHEET 1 OF 1
SCALE 1 : 100
REGION A
CONSULTANTS DRAWING NUMBER 401837/CEN/1000





REVISONS		REFERENCE DRAWINGS		NOTES	
NO	DATE	DESCRIPTION	INITIALS	SKETCH	DRAWING NO.
0	20 FEB 08	FOR ILLUSTRATION IN BASIC ASSESSMENT REPORT			

DESIGNED BY		CHECKED BY		APPROVED BY	
B. COLLET		P.A. BULLMINE		P.A. BULLMINE	
CLIENT		CLIENT		CLIENT	

REVISIONS		REFERENCE DRAWINGS		NOTES	
NO	DATE	DESCRIPTION	INITIALS	SKETCH	DRAWING NO.
1		ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SHOWN			
2		ALL DIMENSIONS IN METERS ABOVE SEA LEVEL (A.S.L.)			
3		ALL DIMENSIONS TO EXISTING WORK SHOWN IN RED			

NINHAM SHAND CONSULTING SERVICES PRIVATE TREATMENT PLANT TEL: 0127 80 012 344 FAX: 0127 80 012 344		NU PLANET REG. NO. 2002/09/18/07 PO BOX 33808, WINDY PARK 0102, SOUTH AFRICA TEL: +27 12 343 2944	

SHEET 1 OF 1	SCALE NTS	REVISION A
SECTION THROUGH POWER STATION		
401832/CEN/1001		

## **APPENDIX C2**

# **VISUAL REPRESENTATION OF THE MINI HYDRO**



# Visual Impact



CURRENT VIEW TOWARDS EXISTING DAM WALL  
STANDING NEXT TO THE WATER AFFAIRS FENCE



CURRENT VIEW TOWARDS EXISTING DAM WALL  
STANDING ON THE DE KRANS DAM WALL



CURRENT VIEW TOWARDS EXISTING DAM WALL  
STANDING ON THE 1ST PATIO OF THE MOST WESTERN UNIT



VIEW TOWARDS EXISTING DAM WALL WITH HYDRO  
IN POSITION STANDING NEXT TO THE WATER AFFAIRS FENCE



VIEW TOWARDS EXISTING DAM WALL WITH HYDRO  
IN POSITION STANDING ON THE DE KRANS DAM WALL



VIEW TOWARDS EXISTING DAM WALL WITH HYDRO IN  
POSITION STANDING ON THE 1ST PATIO OF THE MOST WESTERN  
UNIT



VIEW TOWARDS EXISTING DAM WALL WITH HYDRO IN  
POSITION STANDING ON THE 2ND PATIO OF THE MOST  
WESTERN UNIT



VIEW TOWARDS EXISTING DAM WALL WITH HYDRO IN  
POSITION STANDING ON THE 1ST PATIO OF THE SECOND UNIT  
FROM THE WEST



VIEW TOWARDS EXISTING DAM WALL WITH HYDRO IN  
POSITION STANDING ON THE 2ND PATIO OF THE SECOND UNIT  
FROM THE WEST

# BOTTERKLOOF DAM HYDRO







VIEW FROM ERF NO 1

# BOTTERKLOOF DAM HYDRO



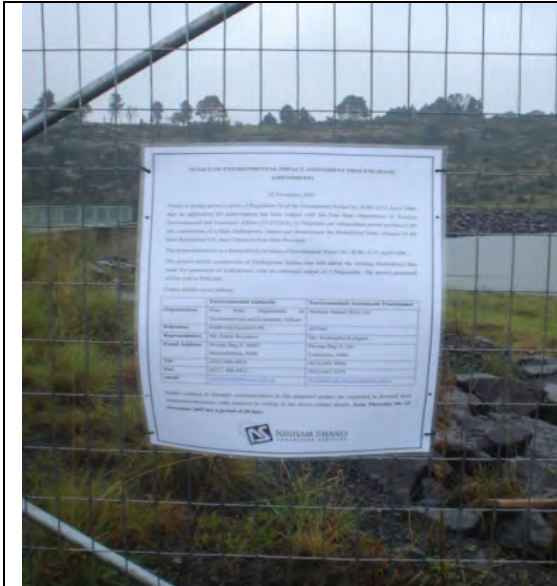
**APPENDIX E1**

**PROOF OF SITE NOTICE**



**CONSTRUCTION OF HYDRO POWER  
 STATION JUST BELOW THE  
 BOTTERKLOOF DAM**

**SITE NOTICE PHOTO REPORT**



**Photo1:** Evidence of site advert placed on the gate outside Boston A Dam.



**Photo2:** View of the site advert and dam with granite stone gabions in the background.



**Photo3:** Close up of site advert placed at the entrance to the Bavaria Conservancy.



**Photo4:** View of the gate and S217 dirt road with site advert. The S217 dirt road leads to the Boston A Dam.

**APPENDIX E2**

**BACKGROUND INFORMATION  
DOCUMENT**

## **BOTTERKLOOF HYDRO: BACKGROUND INFORMATION DOCUMENT**

FS DTEEA Reference Number: EMB/1(k)1(m)4/07/93

### **Introduction**

Nuplanet (an independent power producer) intends to establish a mini Hydropower Station immediately downstream of the Botterkloof Dam situated in the farm Botterkloof 541, near Clarens in Free State Province.

### **Project Description**

The project would entail construction of a Hydropower Station that will utilise the Lesotho Highlands Water Project water that is currently flowing through the existing Botterkloof Dam for the generation of an estimated 3 Megawatts of hydropower. Water will be diverted from the existing outlets of the dam through the penstock into the power station that will be constructed adjacent to the dam wall. This water will turn the turbines in the power station, resulting in the generation of power. The water will then leave the power station through a tailrace and will be discharged back into the river but still within the existing stilling basin of Botterkloof Dam. Power so generated will be sold to ESKOM.

### **Purpose of the document**

The purpose of this document is to:

- Give brief background information to potential stakeholders about the project and the proposed site.

- To briefly describe the Environmental Impact Assessment process that will be followed in order to obtain authorization for the proposed project.
- Afford Interested and Affected Parties an opportunity to give their comments on the proposed project.

### **Site Location**

The proposed project is planned downstream Botterkloof Dam, situated in the farm Botterkloof 541, near Clarens in Free State Province.

### **Biophysical information**

#### *a) Vegetation*

The area where the project is planned is was previously disturbed for the construction of Botterkloof Dam, and is a rehabilitated area. The basal cover is predominantly grass.

#### *b) Fauna*

It is expected that fauna species do occur on site and the surrounding areas. However, the proposed project is unlikely to disturb terrestrial fauna habitat.

#### *c) Geology and Soils*

The soils in the areas are primarily derived from sandstone and mud rocks from the Clarens and the Elliot Formations. The soils are generally lithosols and prone to erosion.

#### *d) Slope*



The overall slope of the site is relatively flat, but as the construction area will be located adjacent to deep rehabilitated cuttings that formed part of the dam construction area. The proposed project will have no impact on the slope of the area.

*e) Hydrology*

The proposed project is planned at the right bank of the As river.

*f) Existing Land Use*

The land use of the current site is undetermined.

*g) Surrounding Land Uses*

The existing land use surrounding Botterkloof Dam is predominantly agricultural, with some low key eco - residential development toward the west.

*h) Access*

Construction vehicles and plant will gain access to the site by simply utilising the existing road infrastructure to the Botterkloof Dam. The same road will be utilised for operational access.

**Environmental Impact Assessment Process**

The proposed activity is a listed activity in terms of Regulation No. R386 of 21 April 2006, and as such requires environmental authorisation. Nuplanet appointed Ninham Shand (Pty) Ltd to conduct the Environmental Impact Assessment Process.

Environmental Impact Assessment process entails assessing potential impacts the proposed development would have on the receiving environment and propose the mitigation measures. This includes preventing the impacts from occurring or stipulating measures that will minimise the potential impacts to acceptable levels. The EIA process required for the proposed project is a Basic Assessment study.

**Public Participation Process**

Current environmental legislation require that the public be informed of the developments taking place and also be afforded opportunity to give comments and/or objection with regard to the proposed development.

In order to ensure that you are registered as one of the Interested and/or Affected Parties (I&APs), forward your comments or objections to:

Mr. Barend Smit  
Ninham Shand (Pty) Ltd  
Private Bag x 136  
Centurion  
0046

Fax: 012 663 3257

Email: [barend.smit@shands.co.za](mailto:barend.smit@shands.co.za)



## **APPENDIX E3**

# **WRITTEN NOTICES TO STAKEHOLDERS**



# F A X M E S S A G E

FOUNDED IN 1932



**NINHAM SHAND**  
CONSULTING SERVICES

1006 Lenchen Avenue North, Centurion, 0157  
Private Bag X136, Centurion, 0046  
Tel: +27 12 643 9000 / Fax: +27 12 663 3257  
E-mail: nscen@shands.co.za  
Website: www.shands.co.za

<b>To:</b> Dihlabeng Municipality	<b>Date:</b> 9 April 2008
<b>Att:</b> M. A Mashinini	<b>No of pages</b> (incl. front page): 3
<b>Fax No:</b> (058)256 1380	<b>Reference Number:</b> EMB/1(k)(m)4/07/93
<b>From:</b> Roshantha Kolapen	<b>Transmission Number:</b> Na
<b>Subject:</b> <b>NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOR PROPOSED CONSTRUCTION HYDRO POWER PLANT ON FARM BOTTERKLOOF</b>	

This message is confidential to the above recipient. If the message you receive is incomplete or indistinct, please advise immediately.

Dear Ms M. A Mashinini

Please find attached a letter describing our intentions.

Kind Regards,

W Howell

Dihlabeng Municipality

286 Kgubetswana  
Clarens

Ref: EMB/1(k)(m)4/07/93  
Date: 9 April 2008

**Attention: Ms M.A Mashinini**

**NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOR  
PROPOSED CONSTRUCTION OF HYDRO POWER PLANT ON FARM  
BOTTERKLOOF.**

Notice is hereby given in terms of regulations 1(k) of Government Notice R386 under section 24(5) of the National Environmental Management Act of (Act 73 of 1998) of the intent to carry out the following Basic Assessment study.

Ninham Shand Consulting Services has been appointed by NuPlanet clean energy to obtain authorisation in terms of National Environmental Management Act (Act 73 of 1998), for the construction of a Hydro Power plant.

The project entails the construction of a hydro next to the Botterkloof dam spillway. The hydro power plant will generate approximately 3 megawatts of electricity that will be sold to Eskom and Dihlabeng Municipality.

The Free State Department of Tourism Environment and Economic Affairs (FsDTEEA) have agreed that we continue with a Basic Assessment process. Current Environmental legislation require us to inform potential stakeholders (interest and/or affected parties), of the proposed activity. Should you have any comment/objection of the proposed activity

Should you have any comments, please forward it to the stated address.

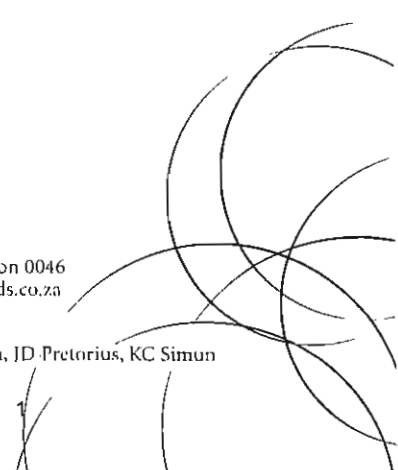
**CENTURION**

1st Floor, Outspan House, 1006 Lenchen Avenue North, Centurion 0157 ■ Private Bag X136, Centurion 0046  
Tel: +27 12 643 9000 ■ Fax: +27 12 663 3257 ■ E mail: ceninfo@shands.co.za ■ Website: www.shands.co.za

Ninham Shand (Pty) Ltd, Reg No 1997/017383/07

Board of Ninham Shand (Pty) Ltd: BMH Tsita (Chairman), AW Möhr (Managing Director), AHM Görgens, N Gwagwa, JD Pretorius, KC Simun

ISO 9001:2000 compliant ■ Registered with SAACE



Yours faithfully

NINHAM SHAND



**Willie Howell**

Principal Environmental Practitioner  
Ninham Shand Centurion  
Outspan House  
1006 Lenchen Ave North  
Centurion 0157

Tel: (012)643-9000  
Cell: (082) 940-0252  
Fax: (012) 663-3257



F A X M E S S A G E



**NINHAM SHAND**  
CONSULTING SERVICES

1006 Lenchen Avenue North, Centurion, 0157  
Private Bag X136, Centurion, 0046  
Tel: +27 12 643 9000 / Fax: +27 12 663 3257  
E-mail: nscen@shands.co.za  
Website: www.shands.co.za

To:	Ditlhabeng Municipality	Date:	9 April 2008
Att:	M. A Mashinini	No of pages (inc. from page):	3
Fax No:	(058)256 1380	Reference Number:	EMB/1(k)(m)4/07/93
From:	Roshantha Kolapen	Transmission Number:	Na
Subject:	<b>NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOR PROPOSED CONSTRUCTION HYDRO POWER PLANT ON FARM BOTTERKLOOF</b>		

This message is confidential to the above recipient. If the message you receive is incomplete or indistinct, please advise immediately.

Dear Ms M. A Mashinini

Please find attached a letter describing our intentions.

Kind Regards,

  
W Howell

TX RESULT REPORT

NAME: NINHAM SHAND  
TEL : 0126633257  
DATE: APR. 09 '2008 14:31

SESSION	FUNCTION	NO.	DESTINATION STATION	DATE	TIME	PAGE	DURATION	MODE	RESULT
1994	TX	01	0582561380	APR. 09	14:30	003	00H00'56"	ECM	OK

**APPENDIX E4**

**COPY OF THE REGISTER OF I&APs**

## List of Interested and Affected Parties

Name	Title	Company/Association	Physical Address	Telephone Number	Email address
<i>Kees Schipper</i>	Property Specialist	Engel & Volkers	76 Garsfontein Road Alphaen Park Pretoria *0081	Phone: 012 460 7775 Fax: 012 460 9543 Cell: 082 410 8968	<a href="mailto:kees.schipper@engelvolkers.co.za">kees.schipper@engelvolkers.co.za</a>
<i>Pat &amp; Ralph Raubenheimer</i>				Phone: 058 256 1123 Fax: 058 256 1124 Cell: 083 450 7070 : 082 900 8200	<a href="mailto:raubenheimer@icon.co.za">raubenheimer@icon.co.za</a>
<i>Nic Trebicki</i>		Rand Water			<a href="mailto:ntrebicki@randwater.co.za">ntrebicki@randwater.co.za</a>
<i>Cameron</i>		Sewula canoes			<a href="mailto:cameron@sewula.co.za">cameron@sewula.co.za</a>
<i>Paul Farrell</i>	Landowner Chairperson of River Bavaria	Paul Farrel Boerdery (EDMS) BPK	Posbus 222 Bethlehem 9700	Phone: 058 256 1131 Fax: 058 256 1372	<a href="mailto:farrell@isat.co.za">farrell@isat.co.za</a>
<i>Danie Krynauw</i>	Environmental Officer	Free State Department of Environmental and Economic Affairs	Private Bag x 20601 Bloemfontein, 9300	Phone: 051 400 4814 Fax: 051 400 4811	<a href="mailto:krynauwd@delea.fs.gov.za">krynauwd@delea.fs.gov.za</a>
<i>Ruben Evans</i>	Waste Manager	Dihlabeng Municipality		Phone: 058 303 5732 Fax: 058 303 5076	
<i>Clr(Ms) Mastephen Mashinini</i>	Ward 11 (ANC)	Dihlabeng Municipality	286 Kgubetswana CLARENS	Tel: 256 1507 (h) 082 826 0537 Fax 058 256 1380	



**APPENDIX E5**

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Faks/Fax: 27 58 - 303 2080

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**HERE IS THE COPY OF THE AD WHICH APPEARED  
IN THE NEWSPAPER : 21/11/2007**

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**REGARDS**

**LUZAAN KETTLEDAS**

**MEDIA 24**

**TEL NO: 058 303 5411**

**FAX NO: 058 303 2080**

**lkettledas@volksblad.com**

INITIALS	DATE	TIME
I.B.T.	06/12/07	11.30

# NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS (BASIC ASSESSMENT)

22 November 2007

Notice is hereby given in terms of Regulation 56 of the Government Notice No. R385 of 21 April 2006, that an application for authorisation has been lodged with the Free State Department of Tourism Environmental and Economic Affairs (FS DTEEA) by Nuplanet (an independent power producer) for the construction of a Mini Hydropower station just downstream the Botterkloof Dam, situated in the farm Botterkloof 541, near Clarens in Free State Province.

The proposed activity is a listed activity in terms of Government Notice No. R386 of 21 April 2006.

The project entails construction of Hydropower Station that will utilise the existing Botterkloof dam water for generation of hydropower, with an estimated output of 3 Megawatts. The power generated will be sold to ESKOM.

Project details are as follows:

	Environmental Authority	Environmental Assessment Practitioner
Organisation	Free State Department of Environmental and Economic Affairs	Ninham Shand (Pty) Ltd
Reference	EMB/1(k)1(m)4/07/93	401944
Representative	Mr. Danie Krynauw	Ms. Roshantha Kolapen
Postal Address	Private Bag X 20601 Elccentfontein, 9300	Private Bag X 136 Centurion, 0046
Tel.	(051) 400 4814	(012) 643 9000
Fax	(051) 400 4811	(012) 663 3257
email	krynauwd@dteea.fs.gov.za	Roshantha.Kolapen@shands.co.za

Parties wishing to formally comment/object to this proposed project are requested to forward their comments/objections (with reasons) in writing to the above contact details, from Thursday the **22 November 2007** for a period of 30 days.



**NINHAM SHAND**  
CONSULTING SERVICES

plmochu  
omplekt. Prys pp  
rAg. Skakal  
3 585 8020.

ARE PERSEON  
kanloor.  
r.k. Ma-Vr.  
g + Afr. Sitakel



g vacancy  
based in

ackage

fax :



**NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS (BASIC  
ASSESSMENT)**

22 November 2007

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<b>Reference</b>	EMB/1(k)1(m)4/07/93	401944
<b>Representative</b>	Mr. Danie Krynauw	Ms. Roshantha Kolapen
<b>Postal Address</b>	Private Bag X 20601 Bloemfontein, 9300	Private Bag X 136 Centurion, 0046
<b>Tel.</b>	(051) 400 4814	(012) 643 9000
<b>Fax</b>	(051) 400 4811	(012) 663 3257
<b>email</b>	<a href="mailto:krynauwd@dteea.fs.gov.za">krynauwd@dteea.fs.gov.za</a>	<a href="mailto:Roshantha.Kolapen@shands.co.za">Roshantha.Kolapen@shands.co.za</a>

Parties wishing to formally comment/object to this proposed project are requested to forward their comments/objections (with reasons) in writing to the above contact details, **from Thursday the 22 November 2007 for a period of 30 days.**



**NINHAM SHAND**  
CONSULTING SERVICES

**APPENDIX E6**

**PROOF OF LANDOWNER CONSENT**



## PAUL FARRELL BOERDERY (EDMS) BPK

Posbus 222  
Bethlehem  
9700

BTW Nr. 4410106571  
Tel: 058 - 2561131  
Faks: 058 - 2561372  
E-mail: farrell@isat.co.za

8 February 2008

### LETTER OF INTENT: BOTTERKLOOF HYDRO

It is recognised that NuPlanet (Pty) Ltd is in the process of developing a small hydro power project provisionally called "Botterkloof Hydro", utilising the water resources of the As River at the Botterkloof Dam on the farm "**Resterende gedeelte van die plaas Botterkloof 541**"

As rightful owner **Paul Johannes Farrell** which owns "**Resterende gedeelte van die plaas Botterkloof 541**", hereby confirm his support of NuPlanet for the development of the hydro power project.

In this regard we would like to express of support and our clear intention to:

- Facilitate the development, construction and operation of a hydro power plant on the As River on the farm "**Resterende gedeelte van die plaas Botterkloof 541**".
- Enter into an agreement with NuPlanet (Pty) Ltd. to negotiate for the lease or sale of the land as required for the construction, establishment and the long-term operation of the hydro power plant.
- Enter into an agreement with NuPlanet (Pty) Ltd. for the permission to construct an electrical power line and roads as required across land owned by Paul Johannes Farrell to access the site connect the hydro power plant to a suitable point in the existing electricity grid.

The exact nature and legal status of the land lease agreement as well as the compensation for the use of the land will be determined to our mutual consent once the feasibility study of the project has been completed and the financing has been secured for the development of the project.

Yours truly



P.J. Farrell



## **APPENDIX E7**

### **COMMENTS RECEIVED FROM I&APs**

**From:** Barend Smit  
**To:** Kees Schipper  
**Date:** 16 July 2007 11:41:35  
**Subject:** Re: FW: Comments on study for hydro electric power plant at Botterkloof (Outfall As river)

Dear Kees

This email serves as an acknowledgment of receipt of your email below. We will be sending you the Background Information Document (BID) shortly.

Regards,

Barend HJ Smit Pr LArch  
Associate

Ninham Shand (Pty) Ltd  
1st Floor Outspan House  
1006 Lenchen Avenue North  
Private Bag X136  
CENTURION  
0157  
South Africa  
Tel.: +27 (0)12 643-9000  
Fax: +27(0)12 663-3257  
email: barend.smit@shands.co.za

>>> "Kees Schipper" <kees.schipper@engelvoelkers.co.za> 2007-07-13 02:15:18 >>>

Dear Sir,

I would hereby like to confirm our telephonic conversation yesterday 12 July 2007 regarding the comments requested in relation with the EIA feasibility study regarding the proposed hydro electric power plant at the botterkloofdam just down from the As river Outfall. EIA Ref no 401 944 and Environmental Authority EMB/(k1)m4/07/93

We own in a consortium unit no 15 at De Kranz conservancy estate. I am glad that my partner Theo came across the board yesterday 12 July 2007 which asked involved and affected parties to comment and be involved in this feasibility study, which I trust we definitely are. Until yesterday we were not aware of this particular study and its position. I did hear on the radio some time ago that there was a possible initiative of constructing a hydro-electric power plant at the dam near Bethlehem but nothing regarding this power plant. This letter should be seen that there was not a lot of time(2 hours) to prepare this response nor have we had any literature regarding this initiative. We therefore would like to be kept informed of all the communication/meetings in this initiative.

I would firstly like to mention that we bought into De Kranz conservancy estate in the end of 2005, with the main function as an exclusive retreat/holiday home in the unspoilt surroundings of Clarens and the view of the vast landscapes of the Eastern Freestate. It is therefore very important that there should be no effect on the estate due to the

proposed siting of the hydro electric power plant in regards of visual/noise pollution as well a no environmental impact on the long run.

We would like to comment on the following issues which might affect the De Kranz conservancy estate and our unit no 15 in particular (Please unsure that the Farrell Family will also make comments regarding this initiative).

1. Access to the site during construction should not affect the Estate regarding the following aspects; Dust, air, noise soil pollution should be kept to a minimum. We also would raise concerns regarding the access to the site and therefore the safety of the Estate and the disturbance of the Game.
2. Access to the site after construction and during routine maintenance should not go through the Estate while this is regarded and stipulated as a Conservancy Estate.
3. As owners of a unit in De Kranz is a visual siting of the power plant from the Estate not acceptable as well as the possible power lines.
4. Also noise derived from generating of the electricity show not be heard from the Estate.
5. Light pollution during the night is also not tolerated.
6. No trembling effect from the turbines should be experienced during operation

We would like to suggest also to look into the matter of installing a direct inline generator just before the As river outlet if not much further upstream. I also would like to question if it is entirely necessary to have a small power plant constructed. As a closing would I like to mention that De Kranz Conservancy Estate is know in the Area a the most prestigious development in the area and a power plant next to it can be detrimental for the Estate, especially from a monetary value.

With kind regards

Kees Schipper  
Property Specialist

ENGEL & VÖLKERS, Projects  
DCR Projects (Pty) Ltd. T/A Engel & Völkers Projects  
License Partner of Engel & Völkers South Africa  
76 Garsfontein Road, Alphen Park  
Pretoria 0081 South Africa  
PO Box 2299, Brooklyn Square 0075  
Phone: +27-(0)12 460 7775  
Fax: +27-(0)12 460 9543  
Mobile: +27-(0)82 4108968  
Internet: [www.engelvoelkers.co.za/projects](http://www.engelvoelkers.co.za/projects)  
[Mailto:kees.schipper@engelvoelkers.co.za](mailto:kees.schipper@engelvoelkers.co.za)

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**CC:** Annelize Nel



**From:** Barend Smit  
**To:** Pat & Ralph Raubenheimer  
**Date:** 07 August 2007 09:59:14  
**Subject:** Re: Botterkloof Hydro

Dear Ralph

Our various discussions refers.

I confirm that the Botterkloof Dam is the dam referred to as Boston A Dam on the 1:50 000 map. The Hydro power station will be located at the dam wall of the dam.

Regards,

Barend HJ Smit Pr LArch  
Associate

Ninham Shand (Pty) Ltd  
1st Floor Outspan House  
1006 Lenchen Avenue North  
Private Bag X136  
CENTURION  
0157  
South Africa  
Tel.: +27 (0)12 643-9000  
Fax: +27(0)12 663-3257  
email: barend.smit@shands.co.za

>>> "Pat & Ralph Raubenheimer" <raubenheimer@icon.co.za> 2007-07-23 12:09:11 >>>  
I have received the background information document regarding the above and would appreciate some clarification on the location of the power station.

The document indicates that the power station will be on the Botterkloof Dam on the Farm Botterkloof 541 near Clarens.

According to the maps that I have 2828AD Jordaanrivier Third Edition 2001, there are two dams adjacent to one another.

The Dam on the Ash River immediately below the TCTA outfall is shown as the Boston Dam whilst the other immediately to the west is unnamed and lies on stream that flows into the Ash River just below the Boston Dam.

Perhaps you would be kind enough to clarify the location.

Regards, Pat & Ralph

email: [raubenheimer@icon.co.za](mailto:raubenheimer@icon.co.za)

Tel/Fax:: +27 58 256-1123

Cell: +2783 450-7070/+2782 900-8200

**CC:** Annelize Nel

## Annelize Nel - Fwd: Botterkloof Hydro - Background Information Document

---

**From:** Annelize Nel  
**To:** kees.schipper@engelvoelkers.co.za  
**Date:** 2007/07/16 11:49 AM  
**Subject:** Fwd: Botterkloof Hydro - Background Information Document

---

Goodmorning,

Attached please find the "BID" document from Barend Smit.

Regards,  
Annelize on behalf of Barend Smit

## Annelize Nel - Botterkloof Hydro - Background Information Document

---

**From:** Annelize Nel  
**To:** <cameron@sewula.co.za>  
**Date:** 2007/07/12 03:47 PM  
**Subject:** Botterkloof Hydro - Background Information Document

---

Gooday,

Attached please find the "BID" document from Barend Smit.

Regards,  
Annelize on behalf of Barend Smit



**APPENDIX E8**

**COMMENTS AND RESPONSES  
REPORT**

	<b>Comment</b>		<b>Response</b>
13/07/2007	Kees Schipper	<ul style="list-style-type: none"> <li>• Requested to be kept informed of all communication / meetings with regards to project.</li> <li>• Noted that De Kranz conservancy was an exclusive retreat / holiday home and that it was very important there should be no impact on estate due to proposed project in terms of visual / noise pollution or any other environmental impacts.</li> <li>• Access to site should not affect estate in terms of dust pollution, air pollution, noise and soil pollution. These should be kept to a minimum.</li> <li>• Safety of the estate and disturbance of the Game was also a concern.</li> <li>• Visual impact of the proposed project as well as possible power lines are not acceptable to landowners in the estate.</li> <li>• Noise generated during the operational phase of the project should not be audible from the estate.</li> <li>• Light pollution at night will also not be tolerated.</li> <li>• No trembling from turbines during operation should be experienced.</li> </ul>	Comments noted, BID sent and Basic Assessment Report will also be made available for comment.

<b>23/07/2007</b>	<b>Pat &amp; Ralph Raubenheimer</b>	Clarification required as to location of proposed project.	Comments noted and Basic Assessment Report will also be made available for comment.
<b>29/05/2007</b>	<b>Koos Barkhuizen</b>	Insight given that the bridge across the Ash River at the Boston A Dam can only carry a capacity of 5 tons and that there is a road that runs beside Jaco Farrell's house which can accommodate construction vehicles, heavy equipment and machinery.	Comments noted and Basic Assessment Report will also be made available for comment.
<b>01/04/2008</b>	<b>Danie Krynauw</b>	<p>Concerned as to which specific site will be used to dispose construction and domestic waste.</p> <p>Questioned whether the Bavaria conservancy was consulted for the proposed construction</p>	<p>Domestic Waste will be collected and transported to a site located on the road leading to Saulspoort Dam. Construction waste disposal site must be determined from the Waste manager of Dihlabeng Municipality- Mr. Ruben Evans (0583035732).</p> <p>The Landowner of The Farm (Mr. Farrell) is also the Chairperson of the Bavaria conservancy. Landowner consent has been obtained (Refer to Appendix E6.</p> <p>Comments noted and Basic Assessment Report will also be made available for comment.</p>

**APPENDIX E9**

**MINUTES OF DE KRANTZ  
LANDOWNERS MEETING**



<b>CLIENT</b>	Nu Planet		
<b>PROJECT</b>	Botterkloof Mini Hydro	<b>Ref. No: 401944/M/1</b>	
<b>MEETING</b>	Interested and Affected Parties Clarification Meeting		
<b>VENUE</b>	Ninham Shand Offices Meeting Room 1		
<b>CURRENT MEETING</b>	<b>Date:</b>	4 September 2008	<b>Time:</b> 16:00
<b>NEXT MEETING</b>	<b>Date:</b>	NA	<b>Time:</b> NA

**Attendance List**

<b>PRESENT</b>	<b>ABR</b>	<b>COMPANY</b>	<b>TEL NO.</b>	<b>FAX NO.</b>	<b>E-MAIL</b>
WH Howell	WH	Ninham Shand	012 643 9000	012 663 3257	Willem.howell@shands.co.za
B Smit	BS	Ninham Shand	012 643 9000	012 663 3257	Barend.Smit@shands.co.za
AL Olivier	AO	Nu Planet	012 349 2944	012 349 2944	al@nuplanet.nl
J Bellew	JB	De Krantz	083 280 7755	011 530 6253	john.bellew@webberwentzel.com
T Malan	TM	De Krantz	-	-	tmalan@iafrica.com
K Schipper	KS	De Krantz	082 410 8968	086 625 2867	keess@limpopo-lipadi.com
B Thomas	BT	De Krantz	082 447 7200	-	Bruce @soliflo.co.za

**1 Welcome and Attendance**

**1.1 Welcome**

All present were welcomed to the meeting. Refer to the attendance list above for a record of attendance.

**1.2 Introductions**

All present introduced themselves.

**1.3 Apologies**

None

**2 Agenda**

**2.1 Additional Items**

No additional items were added.

**2.2 Adoption of Agenda**

An additional list summarizing the main issues raised by the I & AP's were presented as a guide for discussion and the agenda were accepted.

**3 Background to the Botterkloof Mini Hydro**

BS explained the history of the project and that the current environmental process followed in order to conduct the Basic Assessment is driven by legislation in a guided format. It was also explained that the current project status is to give the I & AP's the opportunity to raise their concerns and get them addressed after which the document will be submitted to the local authority in order to get approval. The approval will be subject to certain conditions that must be followed as stated in the approval document (ROD)

**4 Landowners Issues Trail**

**Noise**

JB requested clarification regarding the noise generated during the construction and operational phase. AO explained what the construction process as well as the operational phase will consist off and that the noise during the operational phase will be the same or less as the current flow of water over the weir at Boston A dam. BS added that the current noise levels as well as the construction noise levels of a similar project would be quantified in the Basic Assessment Report (BAR).

It was explained to the I&AP's that the mechanical noise will be mainly for 3 months during the excavation process through the rock and that no permanent staff will be on the site, except for maintenance purposes as required. AO stated that he will consult with the De Krantz landowners about working hours on site in order to reduce the effect on them during certain periods of the year.

**Dust Pollution**

TM stated that dust pollution during the dry season and erosion during the wet

**Ninham  
Shand**

season will increase during the construction period, and added that especially the road through the conservancy is not appropriate for construction vehicles and that various species of animals were present.

AO responded that appropriate mitigation measures like speed bumps, continuous maintenance and water spraying will be put in place. It was also agreed that for both security and conservation reasons a proper fence will be erected and maintained around the area of concern and access for the De Krantz residents will be provided.

### **Visual Affects of the Mini Hydro**

The I & AP's are concerned that the visual effects of the mini hydro with regard to height of the top structure, light pollution and power lines will have a negative effect on their investment.

BS explained by means of the layout drawing and architectural sketch what the top structure would look like and that it will not exceed the current height of the Boston A dam's weir. It was also explained that it is possible to make minor modifications to the design in order to reduce the visual impact, it was also noted that certain measures like cladding etc. can be used to minimise the visual effects.

**Ninham  
Shand**

Lights will only be used on the hydro during times of maintenance at night and for security purposes but these will be mitigated as to minimize the effect on the De Krantz landowners. AO stated that the power lines to connect to the current grid can be laid underground in order to minimise their visual effect but that this will happen in conjunction with Eskom.

### **Distance from De Krantz Development**

JB raised the issue that the report is incorrect with relation to the distance between the De Krantz development and the proposed mini hydro.

WH explained that if the distance is measured on a topographic map it falls without the 500m radius but that Google Earth shows that it falls within the 500m radius but that this will be indicated in the report.

### **Assesment of Alternatives**

KS questioned the reason for exemption application for alternatives. AO responded that there are currently already two mini hydros in construction one at Merino and one at Sol Plaatjies and that due to technological and operational constraints, the site at Boston A dam allows for the best location in terms of position. Alternative technologies are not possible in the area due to geographical and geomorphological constraints. Ideal site is the one at Boston A dam.

**Ninham  
Shand**

### **Security During Construction**

TM is concerned about security issues during construction and the liability of the client. AO stated that security would be dealt with in an appropriate manner by means of fencing and security guards, and clarified that their liability is in place and that it will form part of the final contract with the appointed contractor.

### **Length of the Construction Time**

JB asked what the length of the construction period would be. AO explained that

the pre-feasibility study is currently still being conducted and that construction will only

**Devaluating the value of the De Krantz Properties**

JB and TM stated that the value of their properties will be devaluating and that they will loose potential money in terms of rent. AO noted that he will be in consultation with the I & AP's in order to come to an agreement on a way of compensation for their inconveniences during the construction phase.

**7 General**

No additional issues raised.

**8 Date of next meeting**

If required

**9 Closure**

The meeting closed at 18:30

Compiled by:

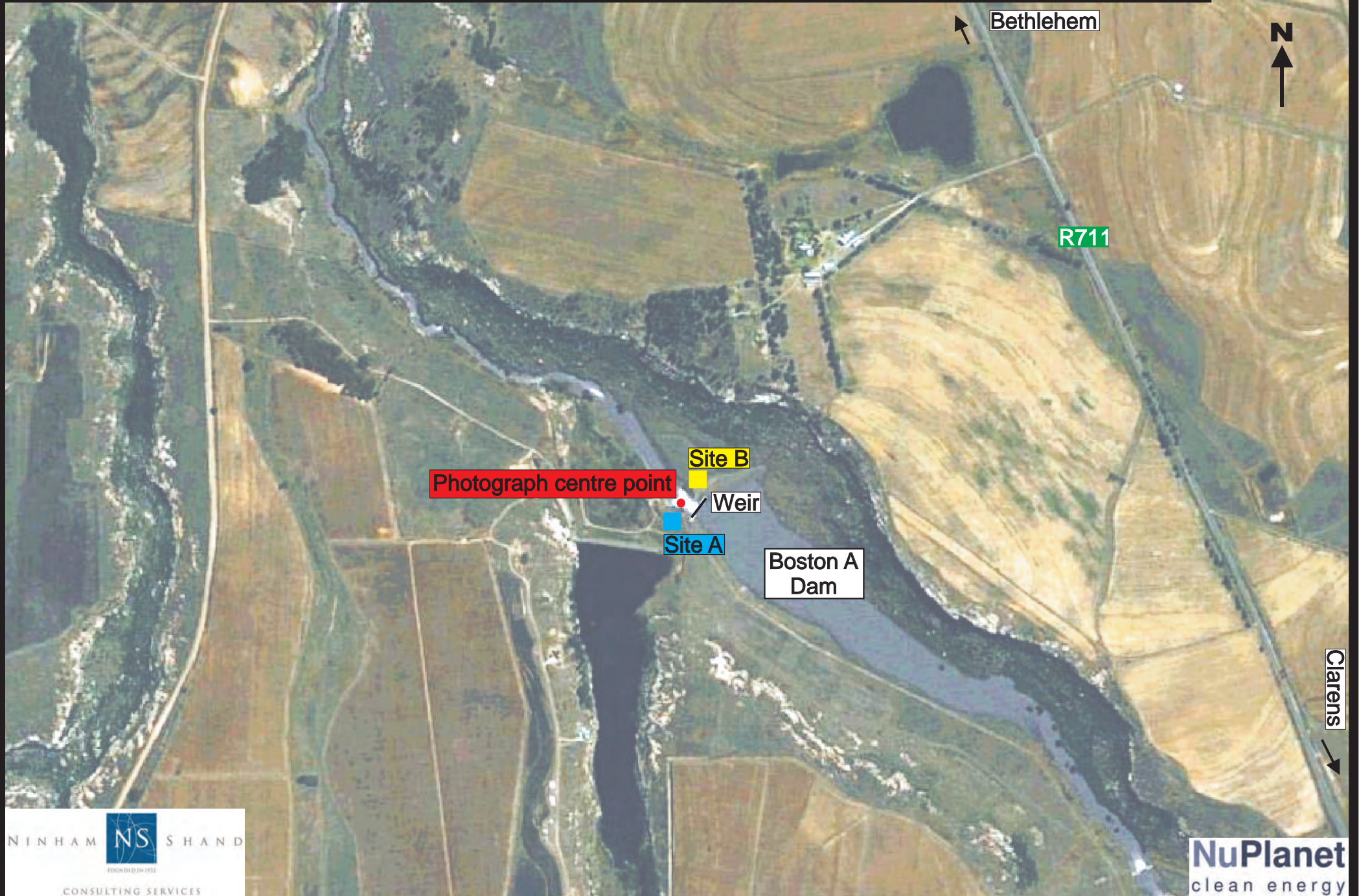
**WH . Howell**  
**Ninham Shand (Pty) Ltd**



## **APPENDIX F1**

### **INFORMATION IN SUPPORT OF APPLICATIONS FOR EXEMPTION – LAYOUT MAP OF BOTTERKLOOF HYDRO POWER PLANT (EXEMPTION APPLICATION)**

# LAYOUT MAP OF BOTTERKLOOF HYDRO POWER PLANT (EXEMPTION APPLICATION)





## **APPENDIX F2**

### **INFORMATION IN SUPPORT OF APPLICATIONS FOR EXEMPTION – CORRESPONDENCE RECEIVED FROM I&APs**

**From:** "Koos Barkhuizen" <kbarkhuizen@bhm.dorea.co.za>  
**To:** "Barend Smit" <barend.smit@shands.co.za>  
**Date:** 2007/05/29 09:10:28 AM  
**Subject:** Brug by dam 4-mini kragstasie studie.

Hi Barend,

Ek wou nog onder jou aandag gebring het dat die brug slegs vir ligte voertuie ontwerp is-(5t veilige vrag)

Daar is blykbaar 'n paadjie wat langs Jaco Farrell se huis verby gaan wat opgegradeer kan word om swaar motor voertuie te akkommodeer.

Groete  
Koos Barkhuizen



## **APPENDIX G1**

# **QUANTIFICATION OF NOISE MEASUREMENTS (NOISE MONITORING REPORT)**

**PROPOSED CONSTRUCTION OF A MINI HYDRO POWER  
PLANT ON THE FARM BOTTERKLOOF 541  
CLARENS DISTRICT – SOUTH AFRICA**



**NOISE MONITORING REPORT**

**NOVEMBER 2008-11-17**

## Table of Contents

1. Introduction .....	2
2. Definition of Noise.....	2
3. Physical Properties of Noise.....	4
4. Measuring Noise.....	4
5. Noise Measurements and Discussion of Results .....	4
6. Conclusion .....	8

## **1. INTRODUCTION**

The proposed Hydro Power Plant will be located on the farm Botterkloof 541, approximately 15 km north of the town of Clarens in the Free State Province. The proposed Hydro Power Plant will convert the kinetic energy from water from the Botterkloof Dam through a turbine and generator into approximately 3 MW of electrical energy that will be sold to Eskom and the Dihlabeng Municipality.

A Basic Assessment Report was compiled and placed in the public domain for comment. Interested and Affected Parties (I&APs) requested that the noise levels be quantified as well as an indication of the noise levels during normal construction activities.

On 24 September 2008, noise levels were measured at three different points (as indicated on Figure 1) and quantified in terms of Maximum, Minimum and Average levels as indicated in Table 4.

## **2. DEFINITION OF NOISE**

Noise, commonly defined as unwanted sound, is an environmental phenomenon to which we are exposed before birth and throughout life. Noise can also be considered an environmental pollutant, a waste product generated in conjunction with various anthropogenic activities.



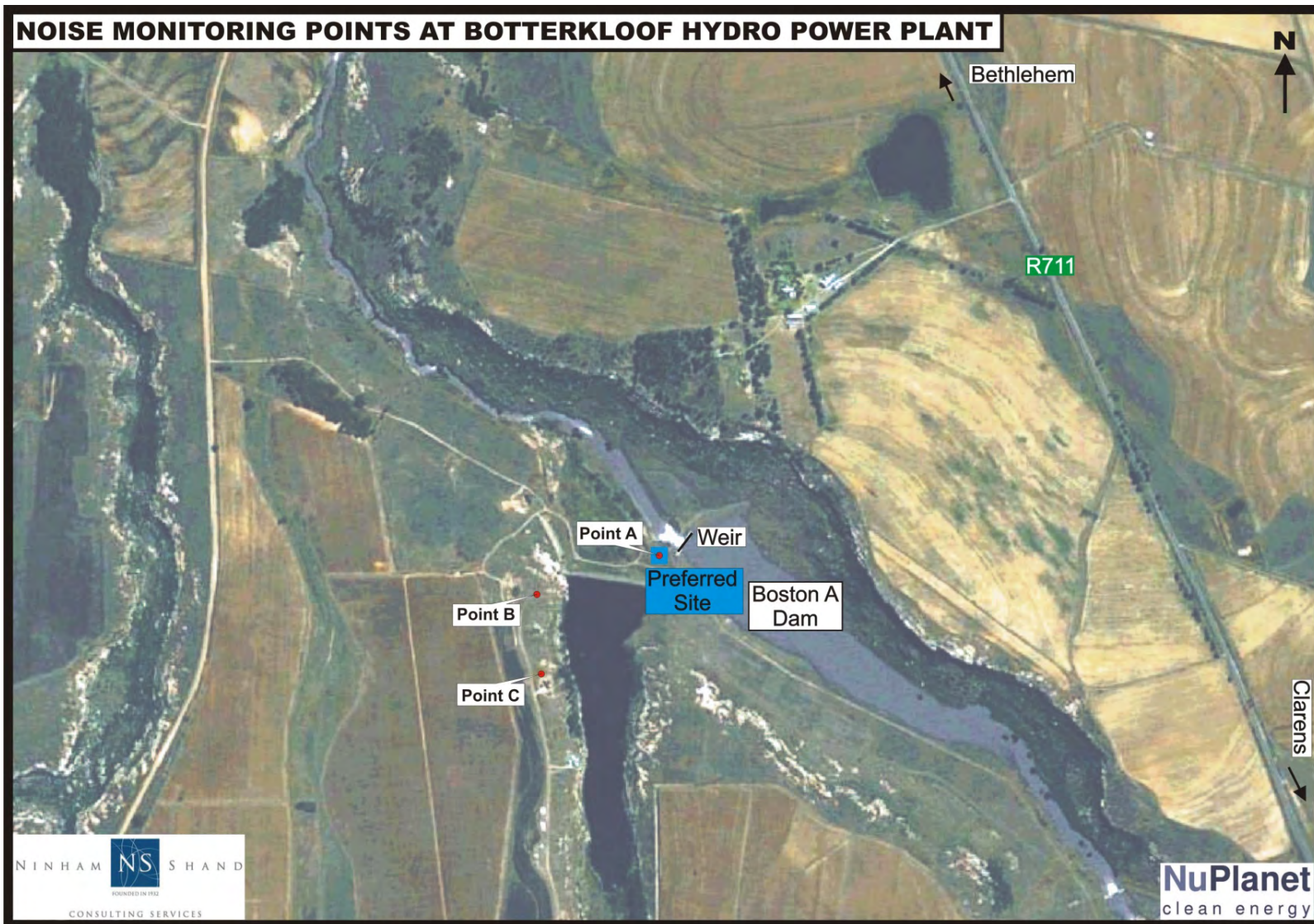


Figure 1: Noise Monitoring Points at Botterkloof Hydro Power Plant

### **3. PHYSICAL PROPERTIES OF NOISE**

Noise is the result of pressure changes in the air, caused by vibration or turbulence. The “loudness” of these pressure changes is stated in terms of sound level, and the rapidity with which these changes occur is the sound’s frequency.

Sound level is expressed in decibels (dB). To hear sounds, air pressure changes must be very rapid. Changes must complete a cycle at least 20 times per second and not more than 20 000 times a second. The rate at which these cycles repeat is called the frequency of the sound and is measured in Hertz (Hz). One Hertz is equal to one cycle per second.

### **4. MEASURING NOISE**

The instrument for measuring noise is the Type 2 sound level meter. Sound meters are designed to measure sounds that the human ear would detect. The ear does not hear very high or low frequencies as well as it can hear middle frequency sounds. Sound meters use special filters to mimic the ear’s performance.

Firstly, it uses a microphone to convert the energy in the sound into an electric signal. When a sound wave hits the microphone, it causes a diaphragm to vibrate, thereby producing electronic signals, which are proportional to the sound pressure causing the vibration. Thirdly, this electronic network then conditions the signal to provide meaningful results transmitted through a visual display.

### **5. NOISE MEASUREMENTS AND DISCUSSION OF RESULTS**

Table 4 illustrates Benchmark Noise Monitoring Data associated with normal construction activities, such as the ones that can be expected during the construction phase. These values were measured at a distance of 150m for a 15 minute duration. The values are shown as a maximum and minimum value and indicated as a worst case scenario. Although the Benchmark noise levels expected can be classified as a noise disturbance according to Table 1, it must be noted that the construction period will not exceed 12 months, of which only 3 months will consist of constant heavy machinery

used during the rock breaking phase. The construction periods will also be negotiated with the landowners at De Krantz Estate as per the meeting of 4 September 2008 in order to minimise the negative impacts on their quality of living.

**Table 3: Measured Botterkloof Dam Noise Monitoring Data**

Point	Duration	Value Level	Value
A	15 min	Maximum	84.3
		Average	68.4
		Minimum	63.2
B	15 min	Maximum	86.1
		Average	66.5
		Minimum	51.1
C	15 min	Maximum	85.4
		Average	67.2
		Minimum	48.6

**Table 4: Benchmark Noise Levels expected from normal Construction Activities**

L <sub>Max</sub>	L <sub>Min</sub>	Cause of Max Reading
54.3	22.8	Grader – Stripping of Topsoil
60.5	17.0	Crickets (Ambient)
75.7	25.5	Birds, Wind (Ambient)
49.7	33.7	Hauling & Levelling of material
56.6	26.1	Cement Truck Activity
56.2	26.4	Excavator Activity
63.0	36.7	Vehicle Passing
99.7	23.3	Blasting
80.3	38.2	Frontloader
70.8	57.3	Generator
81.9	31.9	Water Cart (dust suppression)
69.2	43.5	Heavy Wind
93.0	33.0	Farm Tractor
56.1	23.0	TLB Activity

The measurements in Table 3 illustrate the noise value of the water flowing over the weir, measured at three different locations / distances. It needs to be noted that no change in the noise levels will take place once the proposed Hydro is in place, since the amount of water flow through the hydro will be regulated at a fixed volume with all “additional” water being diverted by means of a channel back to the river. Values will

vary between 86.1 dB (Maximum) and 48.6 dB (Minimum) as water passes through the turbine, which in turn will not cause any trembling due to the fixed location, the noise control measures put in place and the fact that water flow through the turbine will be fixed at a set volume.



**Figure 2: Point A**





**Figure 3: Point B**



**Figure 4: Point C**

## 6. CONCLUSION

It can be concluded that the proposed hydro will not add any additional noise to current levels. As can be seen in Table 2, the maximum measured level at the Botterkloof Dam falls in the class “80 dB – 90 dB”. Common sounds in this category include an electric razor, lawnmower or vacuum cleaner and can be categorised as being Loud to Very Loud. In addition to this, it also needs to be noted blasting activities could probably amount to a maximum of 99.7 dB and a minimum of 23.3 dB. It is however, anticipated that no blasting will take place at the proposed site. The noise generated by the water flowing through the turbine would be 13% less on average than that of blasting. The noise of the water flowing through the turbine would also be 7.5% less than that of a normal farm tractor, which is measured at 93.0 dB (maximum).

Finally, it needs to be reiterated that the rock breaking phase of the construction period (which will last for approximately 12 months) will only last for 3 months, thus the added noise of heavy construction vehicles would be short-lived.

**APPENDIX G2**

**ENVIRONMENTAL MANAGEMENT  
PLAN**



**ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

**FOR THE**

**PROPOSED CONSTRUCTION OF A MINI HYDRO  
POWER PLANT ON THE FARM BOTTERKLOOF 541  
CLARENS DISTRICT, SOUTH AFRICA**

**FREE STATE PROVINCE  
EMB/1(k)1(m) 4/07/93**

**MAY 2008**

**Submitted to:**

Free State Department of Tourism,  
Environmental and Economic Affairs

**Prepared by:**

NinhamShand (Pty) Ltd





## REPORT DETAILS

**FREE STATE DTEEA**

**REFERENCE NUMBER.** : EMB/1(k)1(m) 4/07/93

**TITLE** : Environmental Management Plan (EMP) for the proposed construction of a mini Hydro Power Plant on the farm Botterkloof 541 – Clarens District, South Africa.

**PROJECT NAME** : Construction of Botterkloof mini Hydro Power Plant.

**AUTHOR(S)** : Willem Howell  
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**NINHAM SHAND**

**REPORT NUMBER** : 4640/401944

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<b>Table of Contents</b>		<b>Page</b>
<b>1</b>	<b>INTRODUCTION</b>	<b>1</b>
1.1	Preface	1
1.2	Background	1
1.3	Need for the Environmental Management Plan	2
1.4	Report Structure	2
<b>2</b>	<b>SITE SPECIFIC PROJECT DESCRIPTION</b>	<b>2</b>
2.1	Boston A Dam Site	2
<b>3</b>	<b>ENVIRONMENTAL MANAGEMENT REQUIREMENTS</b>	<b>3</b>
<b>4</b>	<b>ENVIRONMENTAL MANAGEMENT PLAN</b>	<b>4</b>
<b>5</b>	<b>MANAGEMENT OF ENVIRONMENTAL PROBLEMS</b>	<b>21</b>
5.1	Training and Awareness Building	21
5.2	Management of Environmental Non-conformances	21
5.3	Monitoring	21
5.4	Contingency Planning	21

APPENDIX 1 - Environmental Awareness Posters

# 1 INTRODUCTION

## 1.1 Preface

This report deals with the environmental impacts, and the management thereof for the NuPlanet Hydro Project on the farm Botterkloof 541. It presents the Environmental Management Plan (EMP) that will define arrangements for environmental management of the Project during implementation and operation and forms part of the Basic Assessment Report (BAR) carried out by Ninham Shand (Pty) Ltd.

The EMP clearly tabulates the impact mitigation requirements in a format that provides a clear description of what is required, what the goals are, how it should be measured as well as the responsible party for the implementation of each requirement. In this process the environmental management requirements are unpacked and augmented with best practice guidelines, or where required detailed specifications for the implementation of the Project.

## 1.2 Background

NuPlanet is a project development and management company active in the sustainable energy sector. NuPlanet conceptualised a project to harness the water energy from the Boston A Dam in order to generate electricity. The project comprises of a Hydropower Station located on the Botterkloof Farm 541 downstream of the Boston A Dam. The “green” electricity generated by this project will be sold to Dihlabeng Municipality and Eskom.

Ninham Shand (Pty) Ltd. was appointed by NuPlanet in 2007 to assess the environmental impact of the proposed project in fulfilment of the requirements of the Environmental Conservation Act (No 73 of 1989). These requirements included the following:

- Submitting an application for authorization for Basic Assessment to the Free State Department of Tourism, Environment and Economic Affairs (FS DTEEA).
- Undertaking a Public Participation Process in order to ensure that potential stakeholders are well aware of the project and allow them opportunity to comment and / or object.

### 1.3 Need for the Environmental Management Plan

One of the recommendations of the Basic Assessment Report is the development of an appropriate EMP for the construction and operational stage of the project. An EMP is an essential document for ensuring environmental management during the life cycle of a project as it documents and considers all the recommendations from the assessment stage and the requirements of the authorisation, and provides clear guidelines for construction or operational activities.

### 1.4 Report Structure

The remainder of this report is structured as follows.

- **Section 2** provides a short site specific description of the mini hydropower plants at its location;
- **Section 3** elucidates origin and relevance of the Environmental Management Requirements for this project; and
- **Section 4** presents the Environmental Management Plan.

## 2 SITE SPECIFIC PROJECT DESCRIPTION

### 2.1 Boston A Dam Site

The proposed Hydro Power plant will be located on the farm Botterkloof 541, approximately 15km north of the town Clarens in the Free State Province. The proposed Hydro Power Plant will convert the kinetic energy of water from the Boston A Dam, through a turbine and generator, into approximately 3MW electrical energy that will be sold to Eskom and the Dihlabeng Municipality.

The proposed Hydro Power Plant will consist of the following infrastructure:

- An approach channel on the south western part of the weir;
- A power station adjacent to the weir; and
- A tailrace culvert to divert water back into the return channel.



### **3 ENVIRONMENTAL MANAGEMENT REQUIREMENTS**

The environmental management requirements for a project originate primarily from the impact assessment, where the anticipated impacts and associated mitigation measures are described. These impact mitigation measures are usually captured in the recommendations sections of the report.

The environmental management plan presented in Section 4 of this report clearly tabulates the impact mitigation requirements from the assessment in a format that provides a clear description of what is required, what the goals are, how it should be measured and who the responsible party is for the implementation of each requirement. In this process the requirements of the Report are unpacked and augmented with best practice guidelines, or where required detailed specifications for the implementation of the Project.

The requirements of the environmental management plan will be included into the project specific specifications that form part of the contractual agreement between the contractors and the Client for this project.

## 4 ENVIRONMENTAL MANAGEMENT PLAN

Table 4.1 Potential Impacts of the Proposed Project and Mitigation Measures

Aspect	Potential Impact	Mitigation Measure Botterkloof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
Legal	Not complying with relevant legislation.	<p><u>Objective</u>                      -To ensure that there is compliance to all relevant legislation and not only environmental legislation.</p> <p><u>Target</u>                      -Compliance to all relevant legislation.</p>	No breach of legislated requirements.	Botterkloof Hydro	As required	Throughout the project	Botterkloof Hydro
Notification of Authority	Authority not aware of the commencement of activities on site.	<p><u>Objective</u>                      -To ensure that relevant authorities are aware of the activities taking place on site</p> <p><u>Target</u>                      -Letter to Free State Department of Tourism, Environment and Economic Affairs shall be sent, giving at least one week notice prior to commencement of construction activities.</p>	Authority advised of commencement of construction works on site	Botterkloof Hydro	None	One week prior to construction.	Botterkloof Hydro
	Authority not aware of ownership of the project.	<p><u>Objective</u>                      -To ensure that the environmental Authority has latest details of Project Owner.</p> <p><u>Target</u>                      -Letter to Free State Department of Tourism, Environment and Economic Affairs shall be sent, when there is a change of ownership.</p>	Authority advised of change in ownership.	Botterkloof Hydro	None	Prior to change in ownership.	Botterkloof Hydro

Aspect	Potential Impact	Mitigation Measure Botterkloof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
<b>Notification of I&amp;APs</b>	I*APs are not aware of the issuing of the authorisation approving the project.	<u>Objective</u> -To ensure that all I&APs are aware of the issuing of the authorisation.  <u>Target</u> -Notification to all I&APs	I&APs are advised of the issuing of the authorisation.	Environmental Impact Assessment Consultant	As required	Five days after the issuing of the authorisation	Botterkloof Hydro
<b>Site establishment</b>	Establishment of site camp where it may have significant impact on the environment.	<u>Objective</u> -To ensure that site camp establishment is done appropriately in an area where it will not cause significant impact on the environment. -No workers will be allowed to live of site due to the Bavaria status. -Alternative accommodation will be arranged for the workers which must be approved by the engineer and ECO before construction commences.  <u>Target</u> -The contractor shall submit a general layout drawing of his establishment area to a scale of no less than 1:200 to the engineer for approval before any work on the camp or offices commences.	Site/Construction camp established in disturbed area where it will not have further significant impact on the environment.	Contractor	Cost covered within the contract for implementation of the project.	Before establishment of a site camp	Engineer and ECO

Aspect	Potential Impact	Mitigation Measure Botterkloof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
<b>Access to the site</b>	Use of unidentified roads which in turn destroy vegetation and other elements of the environment.	<u>Objective</u> -To limit number of access roads to the site and to prevent unidentified new roads to the site. -The existing access road to the site will be used and maintained by the contractor.  <u>Target</u> -Contractor will not be permitted to construct or use any other road access routes except those identified by engineers. -Other areas of the site not specifically defined which the contractor may require for location of facilities shall be subject to prior approval of the engineer regarding the extent, access and layout.	The existing access road will be used to access the site.	Contractor	None	Throughout construction	Engineer
<b>Environmental awareness of project personnel</b>	Project personnel unaware of environmental management requirements.	<u>Objective</u> To ensure that the environmental management requirements are known to all project personnel and implemented.  <u>Target</u> -All project personnel aware of the environmental management requirements.	All environmental management requirements implemented.	Project Manager Site Engineer Contractor	Safety Officer Signage	Throughout construction period	Botterkloof Hydro



Aspect	Potential Impact	Mitigation Measure Botterkoof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
<b>Outdoor signage</b>	Advertising not up to standard	<p><u>Objective</u></p> <p>-Alert local community and motorists of the activities taking place on site.</p> <p><u>Target</u></p> <p>-Outdoor advertising with the activity shall comply with the South African Manual for Outdoor Advertising Control (SAMOAC).</p>	Proper advertising	Contractor	None	Throughout construction period	Site engineer.
<b>Compliance</b>	Non compliance to environmental recommendations given in the EMP and conditions of the RoD	<p><u>Objective</u></p> <p>-To ensure that the conditions of approval (Environmental Authorisation) and the requirements of the EMP are adhered to.</p> <p><u>Target</u></p> <p>-The project team, including the contractor must be guided by conditions of Authorisation and the EMP when it comes to environmental consideration during construction period.</p> <p>-Penalties with regard to non-compliance should be introduced.</p> <p>-Proof of compliance must be submitted to FS DTEEA in the form of a monthly site inspection report compiled by the ECO.</p>	Adherence to the recommendations in the Authorisation and EMP.	Project team	None	Throughout construction period	Project manager

Aspect	Potential Impact	Mitigation Measure Botterkoof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
<b>Safety</b>	Injuries to construction workers and residents	<p><b>Objective</b></p> <ul style="list-style-type: none"> <li>-To maximize safety of the construction personnel</li> </ul> <p><b>Target</b></p> <ul style="list-style-type: none"> <li>-Occupational Health and Safety Act will be adhered to.</li> <li>-Temporary chemical toilets must be erected during construction (Ration 1:15).</li> <li>-Workers must be equipped with safety clothing at all times.</li> <li>-Open trenches must be marked with warning measures such as danger tapes and orange netting.</li> <li>-A First Aid kit must be provided on site.</li> <li>-Operators of construction machinery must be trained and drivers of vehicles must be in possession of relevant and valid driver's license.</li> <li>-Construction vehicles such as excavators and TLB shall not be allowed to carry any persons other than the operator of such particular machine (i.e. Only operators are allowed in the moving machinery).</li> </ul>	No injuries sustained	Contractor	Cost covered within the contract	Throughout construction phase	OHS, ECO and Site engineer
<b>Water supply</b>	Use of unclean water by construction personnel (workers)	<p><b>Objective</b></p> <ul style="list-style-type: none"> <li>-To ensure that clean water is provided to workers on site.</li> </ul> <p><b>Target</b></p> <ul style="list-style-type: none"> <li>-The contractor will be responsible for supply of potable water at work sites for staff, the engineer and the staff of other contractors involved in the works.</li> </ul>	Sufficient supply of clean water	Contractor	Cost covered within the contract for implementation of the project.	Throughout construction period	Site Engineer and Health & Safety Officer

Aspect	Potential Impact	Mitigation Measure Botterkoof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
		-The contractor shall allow for the supply of water to 20 persons employed by other contractors involved in the work.					
<b>Visual</b>	Visual Impacts	<u>Objective</u> -To minimize visual impacts of the development.  <u>Target</u> -The construction period must be as short as possible and appropriately managed. -Stockpiles should not be high than 2m, and should be covered to minimize erosion, dust generation and unsightly aesthetics. -Ensure appropriate rehabilitation of disturbed areas after completion of construction.	No change in visual aspect of the area.	Contractor	None	During construction period	Site Engineer
<b>Air</b>	Dust pollution	<u>Objective</u> -To prevent dust pollution  <u>Target</u> -The extent of disturbed area should be reduced. -Dust suppression measures such as dampening with water should be used when dust generation is unavoidable, particularly during prolonged periods of dry weather in summer. -Areas stripped should be minimized and phased to limit soil exposure. -Re-vegetation should occur immediately upon completion of construction work.	No noticeable dust.	Contractor	Cost covered within the contract	Throughout construction period	Site Engineer
<b>Noise</b>	Increase in noise levels	<u>Objective</u>	No complaints	Contractor	Cost covered within	Throughout	Site engineer

Aspect	Potential Impact	Mitigation Measure Botterkoof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
	above pre construction ambient noise levels	<p>-To ensure that noise levels are kept at minimum</p> <p><u>Target</u></p> <p>-All regulations relating to noise generation shall be adhered to.</p> <p>-Work shall be restricted to normal working hours.</p> <p>-Machines should be equipped with noise reduction equipment and all vehicles must be roadworthy.</p>	regarding an increase in noise levels		the contract	construction period	
<b>Neatness of the site</b>	Littering on site	<p><u>Objective</u></p> <p>-To ensure that the site clean at all times</p> <p><u>Target</u></p> <p>-The contractor shall, on a day to day basis, keep the site in condition acceptable to the engineer.</p>	Clean site	Contractor	Cost covered within the contract for implementation of the project	Throughout construction period	Site engineer and ECO
<b>Waste</b>	Litter / waste pollution	<p><u>Objective</u></p> <p>-To prevent waste pollution</p> <p><u>Target</u></p> <p>-Hazardous substances such as oil and fuel shall be stored in dedicated areas developed to minimize the impact of spills.</p> <p>-All storage areas, spillage containment areas, containers of hazardous substances and dangerous equipments shall be clearly and prominently marked as such.</p> <p>-Refuse and waste from construction activities will not be disposed of on site but will be removed to registered waste dump by the contractor.</p>	No spillages and solid wastes left lying on the ground	Contractor	Cost covered within the contract for implementation of the project.	Throughout construction period	Site engineer and ECO



Aspect	Potential Impact	Mitigation Measure Botterkoof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
		-The waste disposal facilities used will be the Registered waste disposal site along the road to the Saulspoort Dam. Mr Ruben Evans, Waste manager for the Dihlabeng Municipality should be contacted before construction. Contact Details are Tel:0583035732 or Fax:0583035076					
<b>Disposal sites</b>	Dumping of construction waste on areas not approved	<u>Objective</u> -To ensure that construction wastes are dumped on approved sites only  <u>Target</u> -The contractor shall inform the engineer of any other site he proposes to use for dumping other than those shown in the design drawings. -These sites need to be approved by the Dihlabeng Municipality and engineer before any waste disposal may take place.	Dumping of waste is done on approved sites	Contractor	Cost covered within the contract for implementation of the project.	Throughout construction	Site engineer and ECO
<b>Terrestrial flora</b>	Disruption of normal ecological functions	<u>Objective</u> -To prevent vegetation loss  <u>Targets</u> -The contractor shall refrain from destroying, removing or clearing trees, timber, scrub to any extent greater than it is necessary for the execution of the contract. -The corridor of disturbance should be revegetated soon after construction. -All areas disturbed during construction shall be rehabilitated with indigenous species occurring in the	Replacement of removed indigenous vegetation	Contractor	Cost covered within the contract for implantation of the project.	Construction period	Site engineer and ECO

Aspect	Potential Impact	Mitigation Measure Botterkoof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
		area to standard similar or better than before on completion of the works.					
<b>Fires</b>	Burning of vegetation	<u>Objective</u> -To prevent air pollution and possibility of fire hazards  <u>Target</u> -No fires may be lit on construction site due to the status of the Bavaria area.	No burning of any material on site	Contractor	None	Throughout construction period	Site engineer and ECO
<b>Terrestrial Fauna</b>	Poaching and destruction of faunal habitats	<u>Objective</u> -To ensure that terrestrial fauna on and near the site is protected  <u>Target</u> -The contractor shall take all precautions to prevent loss or injury to domestic and other animals from land used or occupied by the contractor. -Contractor must take care to cause the minimum disturbance to the terrestrial fauna. -A temporary fence shall be erected on the servitude lines during construction period to prevent loss of fauna. The fences shall be removed on completion of construction works and when testing is complete. -No hunting, disturbing, capturing or destroying of animals and birds shall be allowed.	No snares etc and temporary fences in place.	Contractor	None	Throughout construction period	Site engineer and ECO
<b>Aquatic Ecosystem</b>	Disturbance in the functioning of aquatic ecosystem	<u>Objective</u> -To limit the footprint of development on aquatic ecosystem	No pollution of surface water	Contractor	Cost covered within the contract for implementation of the project	Prior to commencement of construction work	Site Engineer and ECO

Aspect	Potential Impact	Mitigation Measure Botterkoof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
		<u>Target</u> -Collection facilities such as ditches, drains, oil separation sumps, sedimentation ponds etc. shall be constructed to prevent contamination of the river. -In case of spill, prompt action shall be taken to clear polluted or affected areas.					
Soil	Soil erosion	<u>Objective</u> -To prevent soil loss  <u>Target</u> -Properly constructed watercourses and energy dissipaters to counter erosion shall be constructed to avoid discharges into agricultural lands or wetlands. -Stockpiles shall be established only in demarcated areas and shall be well managed and maintained -No stockpiles will be established close to embankments or other slopes. -Stockpile materials shall not be allowed to spill into undisturbed areas or watercourses.	No soil erosion	Contractor	Cost covered within the contract for implementation of the project	Throughout construction period	Site Engineer and ECO
	Loss of topsoil	<u>Objective</u> -To ensure that valuable topsoil is not lost during construction.  <u>Target</u> -Topsoil shall be removed approximately 250mm deep from unvegetated areas. It will be salvaged from all areas to be used during construction and will be stockpiled for use during revegetation and	No loss of rich topsoil	Contractor	Cost covered within the contract for implementation of the project	During construction phase	Site Engineer and ECO

Aspect	Potential Impact	Mitigation Measure Botterkoof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
		landscaping.					
Surface water	Sedimentation	<u>Objective</u> -To prevent deposition of organic materials into the water bodies  <u>Targets</u> -Construction activities should be scheduled to occur outside of the rainy period, thereby reducing the anticipated volume of runoff during construction. -Sediment traps and barriers shall be employed where appropriate.	No deposition of material from run off in to the water bodies	Contractor	Cost covered within the contract for implementation of the project	Construction phase	Site Engineer and ECO
	Deterioration of water quality	<u>Objective</u> -To prevent water pollution as a result of construction work  <u>Target</u> -Careful management of the site and education of the construction workers will curtail the risk of pollution spills	No water pollution	Contractor	Cost covered within the contract for implementation of the project	Throughout construction phase	Site Engineer
Change in pH	Temporary increase in the pH levels	<u>Objective</u> -To ensure that there are no significant change in the pH levels of the water bodies  <u>Target</u> -Measures to control concrete wash runoff should be implemented for the duration of the contract. This could include erection of silt fences to prevent fines	Change in pH levels is kept at minimum.	ECO	Cost covered within the contract for implementation of the project	Throughout construction period	ECO & site engineer



Aspect	Potential Impact	Mitigation Measure Botterkoof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
		entering the channel.					
<b>Construction of temporary services and facilities</b>	Impact on aesthetic and faunal and floral communities	<u>Objective</u> -To ensure that construction of temporary services and facilities does not have significant impact on the environment.  <u>Targets:</u> -Where possible, all movement and development should be limited to already disturbed areas.	No further disturbance on the environment	Contractor	Cost covered within the contract for implementation of the project	Throughout construction period	Site Engineer and ECO
<b>Existing infrastructure</b>	Impact on existing infrastructure	<u>Objective</u> -To prevent damage on existing infrastructure  <u>Target</u> -High standard engineering principles applied during planning and construction will mitigate the impact on existing infrastructure at Boston A Dam.	No significant impact on existing infrastructure	Contractor	Cost covered within the contract for implementation of the project	Construction period	Site Engineer and Site engineer
<b>Adjoining landowners</b>	Disturbance on adjacent landowners	<u>Objective</u> -To ensure that adjacent landowners are not negatively affected by the proposed development  <u>Target:</u> -Adjacent landowners and the local community shall be informed of the commencement of construction activity. -Communication between the construction team and local people shall be upheld through the Community Liaison Officer (CLO).	No interference with local communities	Contractor	Cost covered within the contract for implementation of the project	Throughout construction period	Site Engineer and ECO

Aspect	Potential Impact	Mitigation Measure Botterkoof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
<b>Security</b>	Security risk to the surrounding	<u>Objective</u> -To ensure maximum security to workers and community in general  <u>Target:</u> -The contractor shall monitor his site personnel and their activities. -Residents in the area can mitigate security by increased vigilance.	Contractor and adjoining communities	Contractor and adjoining communities	No additional cost will be incurred	Throughout construction	Site Engineer
<b>Traffic</b>	Disturbance in the traffic flow and safety	<u>Objective</u> -To avoid disturbance on normal traffic flow  <u>Targets</u> -All regulations relating to traffic management shall be observed. -Local traffic officials shall be notified of the construction activities. -Adequate and appropriate traffic warning signage and appropriate speed limits for construction vehicles should be adhered to.	No impacts on the public roads	Contractor	Cost covered within the contract for implementation of the project	Throughout construction	Site engineer
<b>Social impact</b>	Theft, prostitution and spread of HIV/AIDS	<u>Objective</u> -To avoid negative social impacts  <u>Targets</u> -The contractor should employ awareness campaigns such as HIV/AIDS education to inform employees of the social and health implications of their actions.	No direct and/or indirect complaints from neighbours with regards to construction personnel behaviour.	Contractor	Cost covered within the contract for implementation of the project	Before construction works commence	Site Engineer

Aspect	Potential Impact	Mitigation Measure Botterkoof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
		<ul style="list-style-type: none"> <li>-Local labour should be used as far as possible during construction of the proposed development.</li> <li>-Local people should be informed appropriately about how this process will unfold.</li> <li>-The contractor must ensure that signs indicating the availability/unavailability of jobs and that the process of hiring local labour is managed correctly to prevent conflict situations and to manage the likely influx of casual labour seekers.</li> </ul>					
<b>Temporary employment opportunities</b>	Unemployment of local people	<u>Objective</u> <ul style="list-style-type: none"> <li>-To ensure that local community is empowered</li> </ul> <u>Target</u> <ul style="list-style-type: none"> <li>-Members of the community could be employed as part of the labour force.</li> <li>-A forum should be set up to implement this.</li> </ul>	Employment of local people in the construction work	Contractor	Cost covered within the contract for implementation of the project	Throughout the life circle of the project	Site engineer
<b>Fires (workers)</b>	Incident of fire as an accident	<u>Objective</u> <ul style="list-style-type: none"> <li>-To ensure that accidental fires do not have a significant impact on the environment</li> </ul> <u>Target</u> <ul style="list-style-type: none"> <li>-Measures to deal with emergency situations, fire fighting, fire control and evacuation procedures should be outlined.</li> <li>-Rehabilitation and re-vegetation of ravaged areas should be outlined.</li> </ul>	Availability of equipments to extinguish fire	Contractor	Cost covered within the contract for implementation of the project	Throughout construction	Site engineer
<b>Flooding</b>	Flooding of the adjacent	<u>Objective</u>	All measure to	Contractor	Cost covered within	Throughout	Site engineer

Aspect	Potential Impact	Mitigation Measure Botterkoof Site	Performance Indicator	Implementation Responsibility	Resources	Time Schedule	Verification Responsibility
	environment which presents a potential threat to both flora and fauna.	-To prevent any possibility of flooding as a result of construction activities  <u>Targets</u> -Measures to maintain the infrastructure and proactive management of potential blockages should be stipulated. -Rehabilitation and re-vegetation of flooded areas should be outlined and implemented to mitigate impacts.	prevent and/or fight floods are ready		the contract for implementation of the project	construction	



**Operational impacts**

Aspects	Potential impacts	Mitigation measures Botterkloof Site	Performance indicator	Implementation responsibility	Resources	Time schedule
<b>Visual</b>	Alteration of rural settings	<u>Objective</u> -To avoid negative visual impact  <u>Target</u> -Powerhouse should be designed to fit in with vernacular architecture and aesthetics of the area. -Hydropower scheme and associated works are shielded from view from the main road between Bethlehem and Clarens by undulating hills in the area.	No PowerStation infrastructure is visible from the main road.	Design engineer	Cost covered within the contract for design of the project	Before construction
<b>Terrestrial flora</b>	Disruption of ecological functions	<u>Objective</u> -To maintain the current status of vegetation in the area  <u>Target</u> -An invasive species removal programme will aid in reducing the impact.	Vegetation type prior to construction and after completion is similar, no invasive species.	Contractor	Cost covered within the contract for implantation of the project	On completion of construction works
<b>Terrestrial fauna</b>	Species loss	<u>Objective</u> -Ensure lesser disturbance in faunal species  <u>Target</u> -The inherent mobility shall enable species to move away from disturbed areas.	No species left in disturbed areas except those that are adapted thereto.	None	None	During and after construction works
<b>Erosion</b>	Downstream erosion of river channel	<u>Objective</u> -To avoid possible erosion of the river channel  <u>Target</u> -Sensitive design of spillway that reduces the velocity	No erosion of river channel	Design engineer	Cost covered within the contract for design of the project	Planning stage

Aspects	Potential impacts	Mitigation measures Botterkloof Site	Performance indicator	Implementation responsibility	Resources	Time schedule
		of the water re-entering the system shall mitigate the impact. - Measures to control velocities and flows should be agreed to and implemented as part of operational EMP.				
<b>Infrastructure</b>	Sedimentation at infrastructure	<u>Objective</u> -To prevent sedimentation at infrastructures  <u>Target</u> -The strong flow of water mitigates the impact.	No deposition of materials on infrastructures	Engineer	Cost covered within the contract for design of the project	Design stage
<b>Recreation</b>	Impact on the recreational potential of a river	<u>Objective</u> -To ensure that recreation of the river still continues even after establishment of hydropower station  <u>Target</u> -The design of a weir, dam wall and intake structures accommodate the movement of canoeists.	Continuation of recreation activities in the Dam	Engineer	Cost covered within the contract for design of the project	Design stage

## **5 MANAGEMENT OF ENVIRONMENTAL PROBLEMS**

### **5.1 Training and Awareness Building**

It is important to ensure that construction workers are aware of the environmental requirements on the project, and the potential problems that may arise from construction activities. It is therefore important to conduct environmental awareness and/or training to construction workers before and during the construction of the project. Follow up training should be done at least once a month through the normal system of “toolbox talks” that should be in place on the site.

Should employees not heed to the environmental requirements on the project despite the training and awareness building, normal disciplinary action should be instituted.

Awareness training material that could be used is available in Appendix1.

### **5.2 Management of Environmental Non-conformances**

Any non-conformances, and specifically continued non-conformances, to the requirements of the EMP should be addressed contractually between by the Site Engineer, Project Manager and the Client. This could include the temporary or permanent withholding of payment under payment items that allow for the environmental management by the Contractor.

Any such withholding of payment should be instituted following communication with the ECO.

### **5.3 Monitoring**

The ECO appointed for the construction period would conduct regular monitoring to ensure compliance with this EMP, and keep records of such monitoring. These monitoring records will be made available to the Site Engineer for record and action as required.

### **5.4 Contingency Planning**

Plans to curb any emergency problems such as fire and flooding such as alluded to in Section 4 of this document, should be devised on site by the Site Engineer and the Contractor. Risk Assessment, with regard to these aspects should be carried out.

## **APPENDIX 1**

### **Environmental Awareness Posters**





**Be courteous and  
friendly to local  
inhabitants.**



**Do not cut down trees or shrubs!**





**Do not disturb wild  
animals or birds!**



**Do not start veld fires!**





**Don't dump hazardous  
substances!**



**Don't waste water!**



**Keep your environment  
clean!**





**Keep your workplace  
tidy!**





**Mix concrete only in  
designated areas!**



**Obey all road signs!**





**Stay on the roads!**



**Stay within the working area!**





**Store materials only in  
designated areas!**



**Use the toilets provided!**





**Wash and service  
vehicles and equipment  
only in designated  
areas!**



**PROTECTION OF THE ENVIRONMENT IS YOUR  
RESPONSIBILITY/ BESKERMING VAN DIE OMGEWING IS JOU  
VERANTWOORDELIKHEID**



**REMAIN WITHIN  
WORKING AREAS  
BLY BINNE  
WERKGEBIEDE**



**NO SWIMMING  
SWEM VERBODE**



**DO NOT HARM OR DAMAGE PLANTS AND  
ANIMALS  
MOENIE PLANTE EN DIERE BESKADIG NIE**



**SMOKE CAUTIOUSLY  
ROOK VERSIGTIG**



**BE AWARE OF FIRES  
PASOP VIR VUUR**



**PREVENT OIL POLLUTION  
VOORKOM OLIE-  
BESOEDELING**



**CONTROL DUST  
BEHEER STOF**



**LIMIT NOISE  
VERMINDER  
GERAAS**



**USE TOILETS  
GEBRUIK DIE  
TOILETTE**



**USE THE EATING AREAS  
EET BINNE DIE  
EETGEBIED**



**USE RUBBISH BINS  
GEBRUIK ASBLIKKE**



**DON'T SPEED/  
SECURE LOADS  
RY STADIG/ MAAK  
VRAGTE VAS**



**KNOW THE EMERGENCY  
NUMBERS  
KEN DIE NOOD NOMMERS**



**ASK QUESTIONS  
VRA VRAE**