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Department:  
**Rural, Environment and Agricultural  
Development**  
North West Provincial Government  
**REPUBLIC OF SOUTH AFRICA**



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**DETAILS AND EXPERTISE OF SPECIALIST AND DECLARATION OF INTEREST**

File Reference Number:	(For official use only)
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Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014

**PROJECT TITLE**

Proposed development of a treated water pipeline from and including the Bospoort Water Treatment Works (WTW) to Rustenburg town, including the development of two new storage reservoirs, Rustenburg Local Municipality, North West Province

**1. Details of Specialist**

Type of Specialist:	Soil scientist, Remote Sensing Specialist	
Company Name:	IRIS International	
Contact person:	Hendrik (Hennie) van den Berg	
Postal address:	20 Boom Street, Potchefstroom	
Postal code:	2531	Cell: 082 978 1760
Telephone:	018 297 6287	Fax:
E-mail:	hennievdb1@gmail.com	
Professional affiliation(s) (if any)	Member of Soil Science Society of SA	

Project Consultant:	Ecoleges Environmental Consultants	
Contact person:	Justin Bowers	
Postal address:	P.O. Box 516, Machadodorp	
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2. Expertise of the Specialist including Curriculum vitae (Appendix 6 (1)(a)(ii) of EIA Regulations, 2014)

## Hendrik Marthinus (Hennie) van den Berg (Remote Sensing and GIS specialist, vegetation ecology and soil science)

Hennie has 28 years experience in natural resource applications using GIS and remote sensing technologies. He obtained M.Sc. in vegetation ecology from the University of Pretoria in 1993. He has extensive experience in stereoscopic interpretation of black and white aerial photographs and obtained in 1989 a postgraduate diploma (NWU) in terrain evaluation for military applications. From 1990 to 1995 he worked in the natural resource section of the Transvaal Region of the Department of Agriculture. Here he was given the opportunity to do digital image processing on SPOT and Landsat satellite data for natural resource characterization. He was employed in 1995 at the Geo-informatics division at the Institute for Soil, Climate and Water. He was project leader for the National Land-Cover and land-cover change-mapping projects at the Institute. He was also project leader and co-worker on various other projects integrating remotely sensed data with other spatial data for monitoring and mapping of natural resources. He specialized in spatial modelling, spatial sampling designs and accuracy assessment of spatial data. In the beginning of 2002 he formed IRIS International including strategic alliances with various specialists inside and outside South Africa.

### Project management

Extensive experience in project management has been acquired over the past 28 years. Hennie has been project leader for various local, regional and international projects. Multidisciplinary teams have been managed and extensive liaison has been done with clients to develop and structure projects.

## IRIS International

Integrated Resource Information Systems

IRIS International specialises in the application of the latest technology to characterize the spatial distribution of natural resources. Remote sensing and GIS technologies are applied in mapping and spatial modelling applications. Custom-made solutions are provided for packaging, distribution and retrieval of spatial data. National and international networking creates synergy for a multidisciplinary approach. Currently IRIS International employs a number of part time specialists on project demand.

IRIS International has extensive experience in the mapping and modelling of natural resources. Remotely sensed data and other spatial data layers are integrated in a GIS environment and supported by relevant fieldwork. Experience gained over the past 28 years includes:

- Soil and vegetation modelling and mapping
- Natural resource auditing





- Land-cover mapping
- Vegetation biomass estimations
- Terrain-mobility analysis for military applications
- DEM correction, terrain morphological mapping and hydrological modelling
- Mineral exploration
- The creation of electronic data atlases
- Spatial sampling designs and accuracy assessment of spatial data
- Project management for large projects
- Remote Sensing and GIS training - nationally and internationally
- Map composition and spatial data creation / integration
- Presentation of research work at various national and international conferences, seminars, workshops and exhibitions
- Scientific publications
- International networking

#### **Projects from 2002-2019:**

- Project management and technical assistance to the National Land-Cover 2000 project – NLC 2000. The duties included technical consortium member evaluation and selection, acting project leader, edge-matching of classifications, quality control, training and accuracy assessment. CSIR and ISCW NLC 2000 project consortium, South Africa.
- The mapping of natural resources (soils and vegetation) and land-cover for 5 provinces (30 million ha) in Angola at a 1:50 000 - 1:100 000 scale.
- The creation of electronic data atlases for several regions in Angola.
- The compilation of Rural Rapid Appraisal (RRA) maps for a number of municipalities in southern Angola.
- Technical assistance for natural resource auditing in development nodes 1 and 4 in South Africa.
- Digital and hard copy vegetation map creation for the greater St. Lucia Wetland Park (South Africa) - EcoTrust.
- Geo-rectification of MSS satellite imagery for the National Department of Agriculture – South Africa.
- Geo-rectification of Landsat ETM and ASTER data for vegetation mapping for a number of farms close to Ghanzi in Botswana - space-map compositions.
- Space-maps for updating the vegetation types of the Kgalagadi Transfrontier Park (South Africa and Botswana).
- Digital vegetation map, area analysis and map compositions for the KGNP
- Digital vegetation map, area analysis and map compositions for several private game reserves (including Phinda, Ithala and Timbavati) - EcoTrust.
- Digital vegetation map, area analysis and map compositions for the Roggeveld region in the Northern and Western Cape - Department of Botany University of Pretoria
- High-resolution land-cover, land-use and transformation mapping for EIA studies (South Africa).
- Terrain mobility assessment for Africa on various scales – SANDF peacekeeping operations.
- *Ad hoc* space map compilation, and digital map creation for vegetation surveys – various areas in South Africa.



- Ortho-rectification of QuickBird imagery for a number of towns in Angola.
- Ortho-rectification of 140 SPOT 4 and 2 images for South Africa.
- Ortho-rectification of Landsat TM images covering the whole of Namibia.
- Hydrological modelling for Porto Amboim (Angola).
- DEM correction and hydrological modelling for the Cape floristic region and California (USA).
- Soil modelling for the Katse and Mohale catchments in Lesotho.
- Characterization of the agricultural potential of Tchiange and Uaba areas in Angola.
- Desktop study on natural resources – sugar production in the Cunene province in Angola.
- Aerial photo mosaic's for a number of farms in South Africa and Botswana (including contour generation and the creation of digital atlases).
- Transformation mapping of forests, woodlands and sensitive ecosystems in Angola (national project).
- Conservation potential studies and desktop mapping for the Tundavala area (Angola).
- The mapping and characterization of natural resources in Namibe province in Angola – ongoing assistance for a PhD study.
- MODIS biomass monitoring for Northwest Province – SA.
- MODIS biomass monitoring for Kuanza Sul and Malange provinces.
- Habitat modelling for the Molopo area.
- Sampling frame for a national alien vegetation survey in Swaziland.
- Vegetation and habitat modelling for Bezuidenhoutshoek private game range.
- Vegetation and habitat modelling for Crock River Gorge conservancy.
- Vegetation and habitat modelling for Sabie Sand game reserve.
- Biomass mapping for power line routing (Delta Epsilon project – Enviro Pulse, PBA and ESKOM 2009).
- Soil modelling and mapping for 3 tertiary catchments in South Africa (3.5 million ha).
- Soil modelling and mapping for KZN and parts of adjacent provinces (15 million ha on 1:100 000 scale) – National Dept of Agriculture .
- Land-Cover mapping for the Free State Province SA (2010-2011).
- Detailed soil mapping for an area of more than 3 000 ha in the Kuanza Sul province of Angola for an irrigation scheme feasibility study (2009-2011).
- Extensive digital elevation data correction for an area of more than 3 000 ha in the Kuanza Sul province of Angola for an irrigation scheme feasibility study (2009-2011).
- National dry-land cotton and maize production potential modelling for Angola (2010-2011).
- Hydrological correction of SRTM digital elevation data for South Africa, Swaziland and Lesotho and full catchment areas stretching into Zimbabwe, Botswana and Namibia – Water Research Commission project (2009-2011).
- Geological feature mapping for study areas in Liberia and the Congo (2011) - Southern Mapping Company.
- Image geo-rectification for Rakodzi, Sable and Springvale farms in Zimbabwe (2011).
- View sheds from the SRTM Digital Elevation Model for southern Africa - SKA





telescope project (2011)

- Semi detail soil mapping (2 000ha) for the Nkomazi area (2011).
- Land-cover mapping for the Upper Orange River catchment (31 SPOT 5 images – 2011).
- Iron deposit probability mapping for the Melmoth area – Southern Mapping Company (2011).
- Field maps and burn management map compositions for Alicecot, Inyati and Ulusaba - Sabie Sand Game reserve (2011).
- Biodiversity, habitat land-use mapping for Jagtlust – Mpumalanga (2011) – joint project with EnviroPule.
- Fire scar mapping for 3 seasons Pilanesburg National Park and surrounding areas (2011).
- Evelyn vegetation map composition – (2012) Department of Botany University of Pretoria
- Map compositions to show the area affected by the 2011 veld fire for 3 study areas (Amalia, Ventersdorp and Bodibe) NW University (2012)
- Habitat, bush density and biomass maps for the Mier and Khuis areas (Kalahari Namib project) – NW University (2012).
- Map compositions for the Amalia, Ventersdoerp and Bodibe areas affected by the 2011 veld fire ) – NW University (2012).
- Geological feature mapping for study areas in the DRC – Southern Mapping Company (2012).
- Flood analysis for a catchment in the Central African Republic – Southern Mapping Company (2012).
- Soil and vegetation mapping for the SASOL Sasolburg and Secunda conservation and farming areas – joint project with EnviroPulse (2012).
- Geological feature mapping and target mineral probability mapping and modelling for a study area in Madagascar – Southern Mapping Company (2012).
- Kloof Driefontein Complex - East vegetation map composition – (2012) Ecotrust
- Geological feature mapping for a study area in Sudan – Southern Mapping Company (2012).
- SKA -telescope core area flood risk mapping – Southern Mapping Company (2012)
- Vegetation map compilations Roodepoort – EnviroPulse (2012)
- Black Eagle Valley map composition - Heli Trace Trust (2012)
- Congo - Sintikoula vegetation map composition - FLORA FAUNA & MAN, Ecological Services Ltd (2012)
- Mineral exploration in Madagascar using multi-spectral and hyper-spectral satellite imagery - Southern Mapping Company (2013)
- Soil and terrain survey for the Wonderwater mine rehabilitation - SASOL (2013)
- Wetland mapping for Kruger, Marekele and Mapungubwe National Parks - IP (2013)
- Land-use change mapping for the period 1985-2010 Congo Mayoko Exxaro study area (2013)
- Hinda land-use change mapping for the period 1990 - 2014 Congo - FLORA FAUNA & MAN, Ecological Services Ltd. Dr. Jerome Gaugris (2014)
- Soil mapping (project manager and coordinator) in the Kilombero valley in Tanzania (52 000 ha semi-detail) – Southern Mapping Company and CDM Smith International (USAID project) (2013 - 2015)





- Soil mapping in Angola for Fazenda Cristalina - Farmsecure/IrriCheck (2013-2014)
- Soil mapping for the Chrisiesmeer conservancy 185 000 ha - EnviroPulse (2013-2014)
- Vegetation condition mapping for the Mier area in the Northern Cape (NWU - 2015)
- BBK flood modelling. Flood modelling for the Pilaanesberg and Bakgatla Ba Kgafela Traditional Administration areas - SATPLAN (2014/2015)
- Dish Mountain Project. Land use change mapping in Ethiopia - FLORA FAUNA & MAN, Ecological Services Ltd. Dr. Jerome Gaugris (2015)
- Dish Mountain Project. Field maps (Ecotrust, 2015)
- Weedy forbs mapping Sasolburg and Secunda rangeland and wildlife areas. SASOL and EnviroPulse (2015)
- One Tree-Hill soil and vegetation mapping assistance to EnviroPulse (2015)
- Consultancy to upgrade the AMESD Drought Monitoring System (DMS) (Software/application) for the Monitoring for Environment and Security in Africa (MESA) - RS/GIS consultant in collaboration with Dr Markus Metz of Geospatial Data Services - MESA SADC THEMA Grant Contract No. FED/2014/328-638 (2015).
- Secunda (SASOL plant and surrounding properties) detailed and simplified land cover maps.( SASOL, 2016)
- Weedy forbs mapping - 3 x focus areas Secunda (EnviroPulse, 2016)
- Kathu Bushveld Kathu Bushveld study: research offset for first development phase of Adams Solar Energy Facility - Mapping of habitat and vegetation types and woody density mapping for 1.4 million ha. (2014-2016 - ENEL and Ecotrust)
- Pre-feasibility study: Habitat and ecological capacity assessments for the Catofe and Somue properties (Sociedade Agro-pecuaria, Sagrada Esperança, 2016)
- Potential alluvial gold deposit mapping - Utah, USA (Oremax and SWIFT Geospatial Solutions, 2017)
- Weedy forbs and veld condition trend mapping - 3 x focus areas Secunda (EnviroPulse, 2017)
- Dunn Roman - Tea Estate, land-cover, frost risk and tea water stress mapping (2017 - Bongani Consulting)
- Borehole identification by satellite imagery and terrain analysis - Rietfontein (Shaun Harrop-Allin, 2017)
- Soil mapping for the proposed development of a 225MW solar PV plant on several portions of the farm Goedehoop also known as part of the farm De Bad, Hanover District, Northern Cape (Ecoleges and Soventix 2017)
- Vegetation map - Dish Mountain Project Ethiopia (FLORA FAUNA & MAN, Ecological Services Ltd., 2018)
- Construction of timeline and supporting images for Carolina farm dam development - Mpumalanga (DICK KERSLAKE FAMILY TRUST, 2018)
- Land-cover-use analysis - Dish Mountain Project Ethiopia (FLORA FAUNA & MAN, Ecological Services Ltd., 2018)
- Vegetation growth analyses for various locations in North West Province, RSA (Geolab, 2018 - ongoing project).
- High resolution multi-sensor developmental project - NW province (Gyrolag 2018 - ongoing project)
- Soil modelling - NW province and parts of Freestate- and Northern Cape



provinces (Geolab, 2018 - ongoing project)

- Land-use analysis - Guinea land-use for periods 1994, 2002 and 2019 (FLORA FAUNA & MAN, Ecological Services Ltd., 2019)
- Rangeland early warning system for southern, central and western Angola (EDIFOX, 2019 - ongoing project)





3. Declaration by Specialist

I, HM van den Berg (Name of Specialist) of IRIS Int. (name of company) declare that;

- I act as an independent specialist in this application.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant.
- there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant/ Environmental Assessment Practitioner appointed by applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- **all the particulars furnished by me in this form are true and correct; and**
- **I realise that a false declaration is an offence in terms of Regulation 48 and is punishable in terms of Section 48B(2) of the Act.**

HM van den Berg  
Signature of the specialist

TA IRIS International  
Name of company (if applicable)

26 / 04 / 2019  
Date

26 / 04 / 2019  
Date

[Signature] AIC  
Signature of the Commissioner of Oaths

2019/04/29  
Date

AIC.  
Designation

Official stamp:

