



**PROPOSED URBAN DEVELOPMENT AT PABALELLO SITE NO.2,  
UPINGTON, NORTHERN CAPE**

**FRESHWATER STATEMENT  
and Stormwater Management Plan**

A REQUIREMENT IN TERMS OF SECTION 21 OF THE NATIONAL WATER ACT  
MAY 2023



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## 1 Introduction

The Dawid Kruiper Municipality advertised for tenders pertaining to new urban developments in Upington. One such proposed township is in Paballelo to the north of downtown Upington. For this report, it was dubbed Paballelo No.2, as there is yet another similar development close by (Van Driel, 2023)

Several consultants and specialists must be appointed to take the municipality through the legal and environmental processes, in particular the SPLUMA legislation (Act 16 of 2013). Other relevant legislation is the NEMA and the NWA. This process was started to make provision for the much-needed residential erven in the sub-economic market.

Enviro Africa of Somerset West was subsequently appointed to carry out the EIA, in terms of NEMA, together with the public participation process (Figure 1). This process started in March 2023.

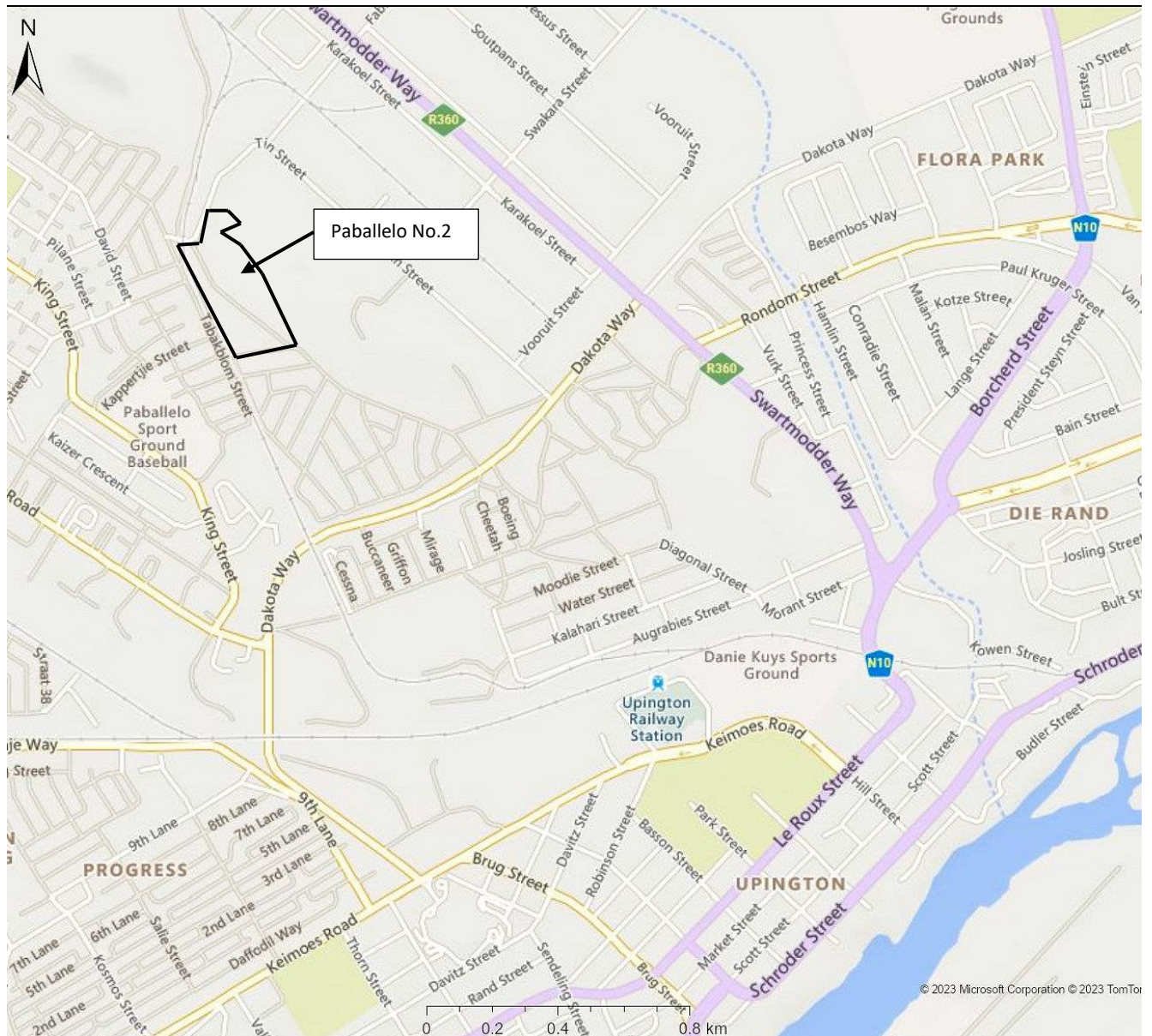
If there are any aquatic habitat features on the site such as rivers, wetlands or even mostly dry drainage lines, a Freshwater Report along with a WULA is required in terms of the NWA. In the case of Paballelo No.2, no such features were observed. It leaves the site without the need for a WULA, but still requires the endorsement of a registered scientist. It still requires observations and recommendations regarding stormwater management. Hence this statement.





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## 2 Locality

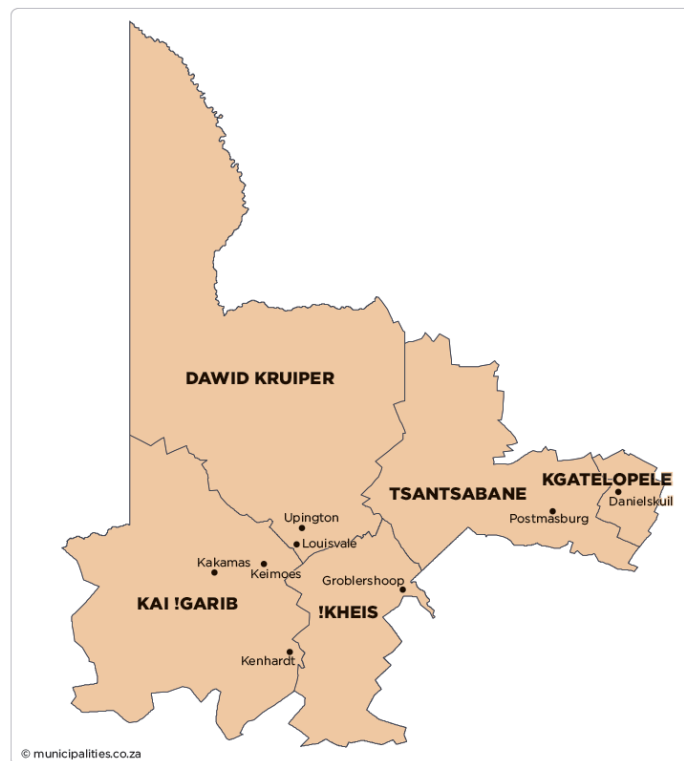


**Figure 2** Location

Paballelo No.2 is located just to the west of the R360 trunk road along a railway line (Figure 1). The coordinated of the middle of the proposed development are:

28°26'29.30"S and 21°13'33.99"E

### 3 Overview Dawid Kruiper Local Municipality



**Figure 3** Map Dawid Kruiper Municipality

The Dawid Kruiper Municipality covers a surface area of 44 399km<sup>2</sup>. The population in 2017 was 144 000. It is demarcated in the south by the Orange River and to the north stretches the wide expanses of the Kalahari Desert. It is flanked by Namibia in the west and by Botswana in the east. Most of the economic activity is concentrated in the city of Upington.

Large-scale farming with grapes, mainly raisins, wine and export fruit is the mainstay of the local economy. Farming activities are labour intensive and provide literally thousands of employment opportunities. These people require housing and many of them are concentrated in small settlements along the Lower Orange River. WATSAN Africa has been active in the official authorisation process of new settlements in the area, in and around the Dawid Kruiper Municipality, as indicated in Figure 3.

The Paballelo No.2 development will cover a surface area of 13 hectares.

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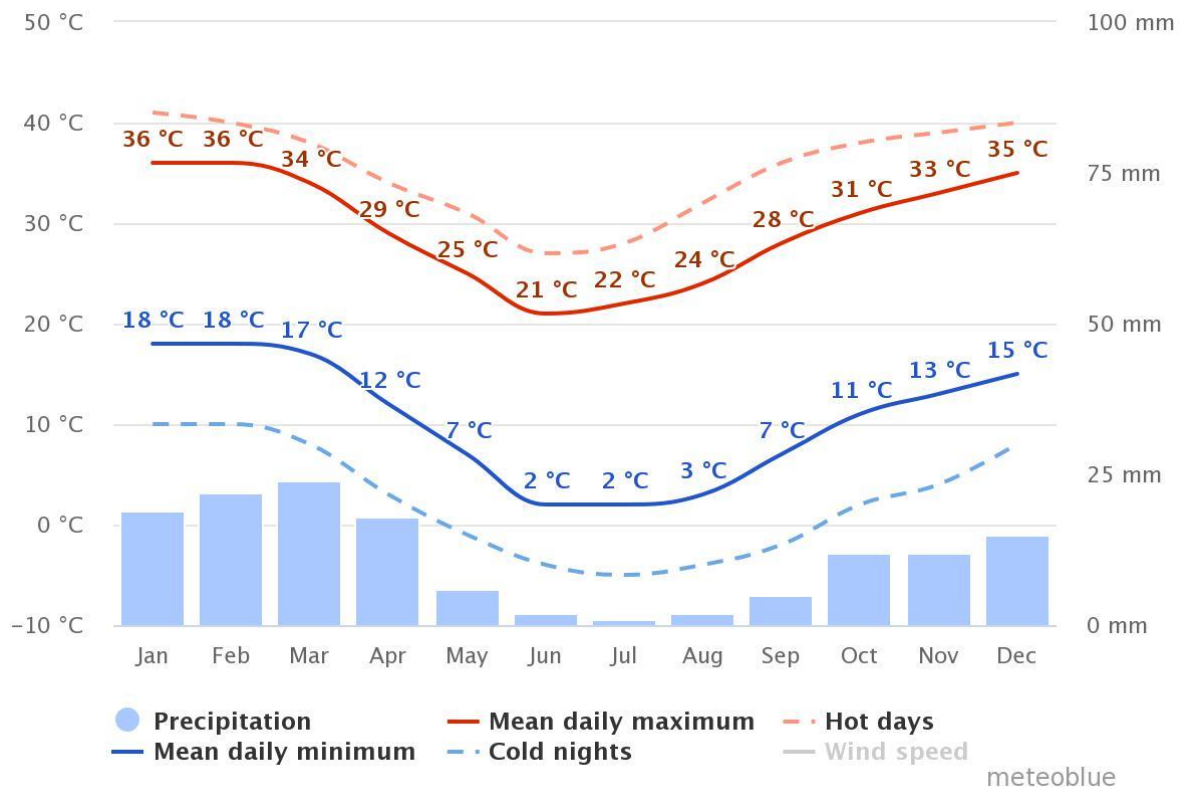


**Figure 4** New settlements in and around the Dawid Kruiper Municipality.

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## 4 Climate Upington

[https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/upington\\_south-africa\\_945945](https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/upington_south-africa_945945)



**Figure 5** Climate Upington

Summers in Upington are extremely hot, with temperatures often higher than 40°C. The winters are moderate.

The average annual rainfall only demands to 164mm, with rainfall during summer and little or no rain during winter. The dry season with no rain can last for 7 months or longer.

(<http://www.upington.climateps.com> › precipitation).

Sudden electric thunderstorms happen, with fierce downpours, sometimes with hail. Rainfall is erratic, with very long periods of drought that can last for years.



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The Orange River came down in flood twice over these last two years. The bulk of this water was from the upper catchment and despite of the rain in Upington, the lower catchment does not contribute much to the flow.

Upington and surrounds are entirely dependent on the Orange River for its water needs and is not reliant on rainfall.

## 5 Quaternary Catchment

Upington is in the D73F quaternary catchment.

## 6 Conservation Status

### 6.1 DFFE Screening Tool

**Table 1** DFFE Screening Tool Results

Theme	Sensitivity Rating
Animal Species	High
Plant Species	Low
Terrestrial Biodiversity	Very High

The Animal Species Theme was rated as High because of the possible presence of the lanner falcon *Falco biarmicus*. This is a cosmopolitan species. The development at Paballelo is not going to make any difference to its conservation status. Likewise, Ludwig's bustard *Neotis ludwigii* is listed as Endangered in South Africa because of its propensity to collide with power lines, which can be fatal. No such power lines will be constructed at the envisaged Parabellelo township.

The Terrestrial Biodiversity is listed as Very high because it is indicated as an ESA. The Screening Tool does not indicate why it is listed as such, but it is unlikely that the proposed township will have any material impact on the conservation status of this ESA.

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Mr Peet Botes Pr.Sci.Nat, environmental consultant, has produced an elaborate report to address these screening tool concerns. According to this report, there are no valid reasons to back up any concern.

## 6.2 Spatial Biodiversity Plans

The Orange River is listed as a NFEPA, as are all large rivers and major tributaries in South Africa. The drainage lines in and around Paballelo are not listed.

## 6.3 Vegetation

According to Mucina and Rutherford (2006) the vegetation type is Kalahari Karoid Shrubland, which is listed as Least Concern. Apart from a sparse scattering of original plants, there is nothing left of this vegetation on the proposed site.

There is still shrub left on the less disturbed land next to the proposed development (Figure 6), but on the land itself the natural vegetation has been trampled and replaced with a sparse stand of grasses (Figure 7).



**Figure 6** Shrub

The vegetation and biodiversity aspects are better explained by Botes (2023).

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**Figure 7** Barren land and grasses

## **7 Municipal Services**

Paballelo No.2 is flanked by urban areas on the western and the southern boundaries (Figure 8). To the east is an industrial area. A railway line forms its western boundary. The railway line cuts through the northern part of the township.

There are already houses, streets (Figure 9) and even spaza shops in Paballelo No.2 (Figure 10), arranged in places in an impromptu and informal manner (Figure 8). The formal lay-out of the township, streets, erven, open spaces, etcetera, has not yet been done. A professional town and regional planner must still do this work, even though the space has already been occupied for a long time.

The dirt streets are well used. The main streets have been formalised, graded and with road signs (Figure 9).

Residents have outside toilets (Figure 11). Some of them have self-made pit latrines, other a bucket system that is being emptied by the municipality into tanker trucks and then removed to the municipal wastewater treatment works.

Potable water is provided from 5000 litres JoJo tanks in the township that are filled from municipal tanker trucks. Residents fill their household containers from these tanks.

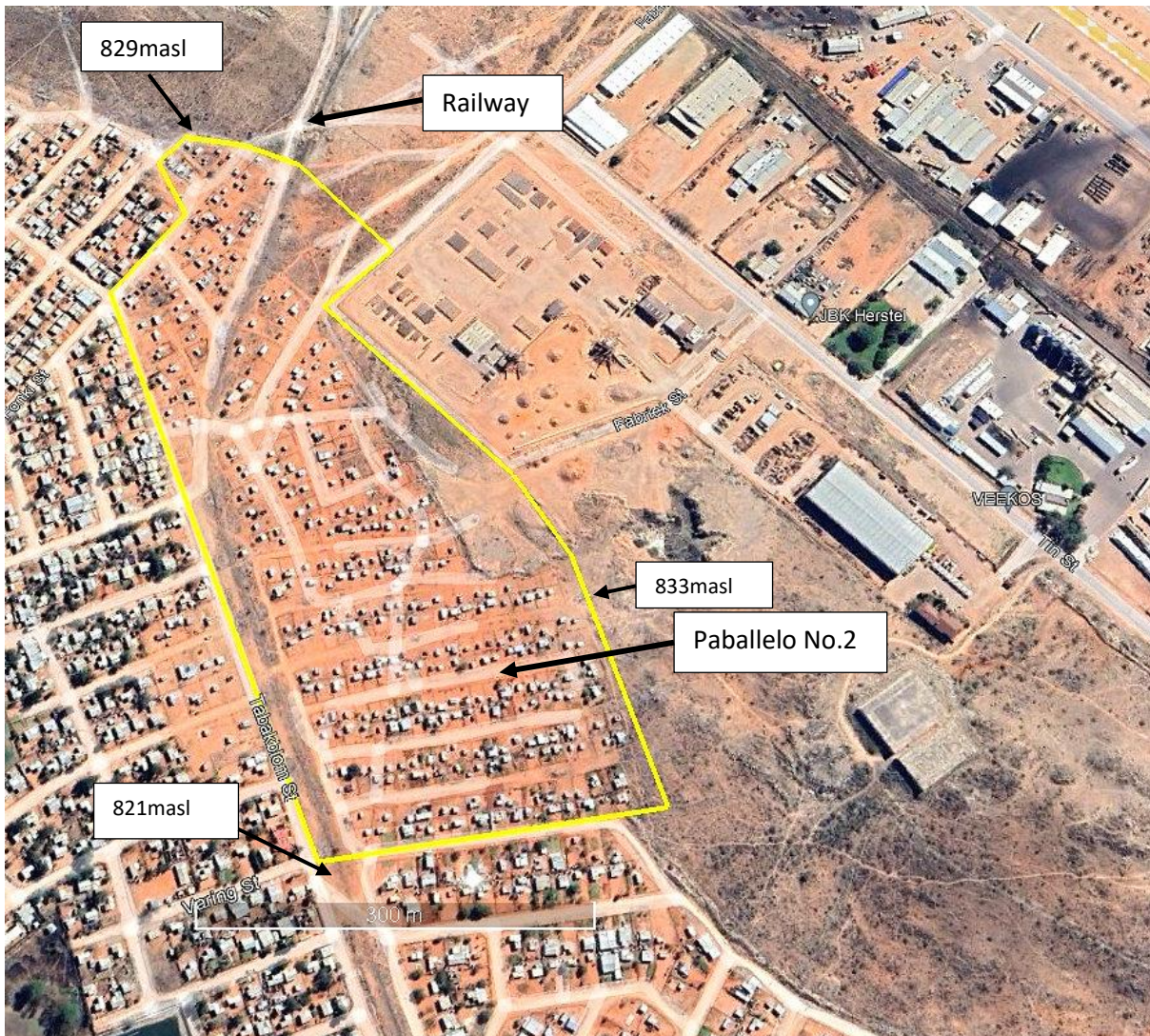
Eventually, each erf will be provided with a proper unit that consists of an outside toilet connected to the central waterborne sewerage as well as a tap connected to the formal municipal potable water provisioning system. This planning is still in the early stages, according to Mr Thys Neels from the municipality, and it will take time and funding to finalise. Meanwhile, the official authorisation processes must proceed, such as the EIA and the WULA.



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Household solid waste is currently removed according to a fixed schedule by the municipality utilising the so-called black bag system. The township is remarkably clean, according to observations.

Swales have been constructed in green zones among some of the houses. A swale is a shallow depression, perhaps half a metre deep and 2 metres wide, with gentle sloping sides, smoothed over and landscaped. Swales are part of the urban stormwater management system.



**Figure 8** Paballelo 2 Google Earth Image



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**Figure 9 Streets**



**Figure 10 Spaza Shop**

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**Figure 11** Toilet



## 8 Stormwater

The elevation on the northern boundary is 829masl (Figure 8), with the elevation at the southern boundary at 821masl (Figure 8). This is only a mean slope of 0.6 vertical metres in every 100 horizontal metres, which is a very gradual slope not conducive to a fast runoff. The erosion potential is low.

The mean slope from east to west is much more, 3.3 vertical metres in every 100 horizontal metres. Stormwater therefore runs down the existing streets from the east to the railway line with a potential high velocity, mobilizing the soil along with it, if it occasionally rains hard enough.

The seemingly disused railway line (Figure 7) seems to be a low watertight barrier. Stormwater can be expected to be diverted to the south along the railway line and then into the city's stormwater infrastructure and eventually out into the Orange River. If the railway line running through the township is porous, stormwater will find its way into the adjacent township further to the west. Tabakblom Street adjacent to the west of the railway line can serve as a stormwater cut-off to divert stormwater to the south into an open piece of land and then into the urban stormwater system. If stormwater ends up in the adjacent township to the west, it won't make much of a difference, as the lowest point in the township is approximately one street block away to the west, from where the flow path is to the south, underneath Dakota Street and then into the urban stormwater system towards the Orange River.

The urban catchments to the north along the railway line and to the east into the industrial area, are small. Given the low rainfall, a set of swales from east to west along each of the streets in the proposed development would probably be enough to effectively deal with stormwater.

## 9 Conclusions

There are no drainage lines on the premises or any other sign of aquatic habitat. Therefore, a WULA and supporting Freshwater Report is not required. A registered scientist or an engineer is required to make such a statement to validate this observation. Hence this Freshwater Statement.

Stormwater can probably be dealt with a shallow, levelled and landscaped swales along the streets, given the low rainfall and the arid nature of the Northern Cape. The usual underground urban conduits are probably not required.

## 10 References

Botes, PJJ. 2023. *Botanical scan and terrestrial biodiversity compliance statement*. PB Consult, Bredasdorp.

Mucina, L. & M.C Rutherford. 2006. *The vegetation of South Africa, Lesotho and Swaziland*. SANBI, Pretoria.

Van Diel, D. 2023. *Water use license application for the proposed urban development at Baballelo, Upington, Northern Cape. Freshwater report and stormwater management plan*. WATSAN Africa, Knysna



## 11 Declaration of Independence

I, Dirk van Driel, as the appointed independent specialist hereby declare that I:

- Act/ed as the independent specialist in this application
- Regard the information contained in this report as it relates to my specialist input/study to be true and correct and;
- 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 NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management act;
- Have and will not have vested interest in the proposed activity;
- Have disclosed to the applicant, EAP and competent authority any material information have or may have to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the environmental Impact Assessment Regulations, 2010 and any specific environmental management act.
- Am fully aware and meet the responsibilities in terms of the NEMA, the Environmental Impacts Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R543) and any specific environmental management act and that failure to comply with these requirements may constitute and result in disqualification;
- Have ensured that information containing all relevant facts on respect of the specialist input / study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties facilitated in such a manner that all interested and affected parties were provided with reasonable opportunity to participate and to provide comments on the specialist input / study;
- Have ensured that all the comments of all the interested and affected parties on the specialist input were considered, recorded and submitted to the competent authority in respect of the application;
- Have ensured that the names of all the interested and affected parties that participated in terms of the specialist input / study were recorded in the register of interested and affected parties who participated in the public participation process;
- Have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable or not and;
- Am aware that a false declaration is an offence in terms of regulation 71 of GN No. R543.

Signature of the specialist:



15 May 2023

**Dr Dirk van Driel**  
PhD, MBA, PrSciNat, MWISA  
Water Scientist

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### Experience

**WATSAN Africa, Cape Town. Scientist 2011 - present**

**USAID/RTI, ICMA & Chemonics. Iraq & Afghanistan 2007 -2011**  
Program manager.

**City of Cape Town 1999-2007**  
Acting Head: Scientific Services, Manager: Hydrobiology.

**Department of Water & Sanitation, South Africa 1989 – 1999**  
Senior Scientist

**Tshwane University of Technology, Pretoria 1979 – 1998**  
Head of Department

**University of Western Cape and Stellenbosch University 1994 - 1998 part-time**

- Lectured post-graduate courses in Water Management and Environmental Management to under-graduate civil engineering students
- Served as external dissertation and thesis examiner

### Service Positions

- Project Leader, initiator, member and participator: Water Research Commission (WRC), Pretoria.
- Director: UNESCO West Coast Biosphere, South Africa
- Director (Deputy Chairperson): Grotto Bay Homeowner's Association

## Reports

- Process Review Kathu Wastewater Treatment Works
- Effluent Irrigation Report Tydstroom Abattoir Durbanville
- River Rehabilitation Report Slangkop Farm, Yzerfontein
- Fresh Water and Estuary Report Erf 77 Elands Bay
- Ground Water Revision, Moorreesburg Cemetery
- Fresh Water Report Delaire Graff Estate, Stellenbosch
- Fresh Water Report Quantum Foods (Pty) Ltd. Moredou Poultry Farm, Tulbagh
- Fresh Water Report Revision, De Hoop Development, Malmesbury
- Fresh Water Report, Idas Valley Development Erf 10866, Stellenbosch
- Wetland Delineation Idas Valley Development Erf 10866, Stellenbosch
- Fresh Water Report, Idas Valley Development Erf 11330, Stellenbosch
- Fresh Water Report, La Motte Development, Franschhoek
- Ground Water Peer Review, Elandsfontein Exploration & Mining
- Fresh Water Report Woodlands Sand Mine Malmesbury
- Fresh Water Report Brakke Kuyl Sand Mine, Cape Town
- Wetland Delineation, Ingwe Housing Development, Somerset West
- Fresh Water Report, Suurbraak Wastewater Treatment Works, Swellendam
- Wetland Delineation, Zandbergfontein Sand Mine, Robertson
- Storm Water Management Plan, Smalblaar Quarry, Rawsonville
- Storm Water Management Plan, Riverside Quarry
- Water Quality Irrigation Dams Report, Langebaan Country Estate
- Wetland Delineation Farm Eenzaamheid, Langebaan
- Wetland Delineation Erf 599, Betty's Bay
- Technical Report Bloodhound Land Speed Record, Hakskeenpan
- Technical Report Harkerville Sand Mine, Plettenberg Bay
- Technical Report Doring Rivier Sand Mine, Vanrhynsdorp
- Rehabilitation Plan Roodefontein Dam, Plettenberg Bay
- Technical Report Groenvlei Crusher, Worcester
- Technical Report Wiedouw Sand Mine, Vanrhynsdorp
- Technical Report Lair Trust Farm, Augrabies
- Technical Report Schouwtoneel Sand Mine, Vredenburg
- Technical Report Waboomsrivier Weir Wolseley
- Technical Report Doornkraal Sand Mine Malmesbury
- Technical Report Berg-en-Dal Sand Mine Malmesbury
- Wetland Demarcation, Osdrif Farm, Worcester
- Technical Report Driefontein Dam, Farm Agterfontein, Ceres
- Technical Report Oewerzicht Farm Dam, Greyton
- Technical Report Glen Lossie Sand Mine, Malmesbury
- Preliminary Report Stellenbosch Cemeteries
- Technical Report Toeka & Harmony Dams, Houdenberg Farm, Koue Bokkeveld
- Technical Report Kluitjieskraal Sand & Gravel Mine, Swellendam
- Fresh Water Report Urban Development Witteklip Vredenburg
- Fresh Water Report Groblershoop Resort, Northern Cape
- Fresh Water Report CA Bruwer Quarry Kakamas, Northern Cape
- Fresh Water Report, CA Bruwer Sand Mine, Kakamas, Northern Cape
- Fresh Water Report, Triple D Farms, Agri Development, Kakamas
- Fresh Water Report, Keren Energy Photovoltaic Plant Kakamas
- Fresh Water Report, Keren Energy Photovoltaic Plant Hopetown
- Fresh Water Report Hopetown Sewer
- Fresh Water Report Hoogland Farm Agricultural Development, Touws River
- Fresh Water Report Klaarstroom Wastewater Treatment Works
- Fresh Water Report Calvinia Sports Grounds Irrigation

- Fresh Water Report CA Bruwer Agricultural Development Kakamas
- Fresh Water Report Zwartfontein Farm Dam, Hermon
- Statement Delsma Farm Wetland, Hermon
- Fresh Water Report Lemoenshoek Farms Pipelines Bonnyvale
- Fresh Water Report Water Provision Pipeline Brandvlei
- Fresh Water Report Erf 19992 Upington
- Botanical Report Zwartjongensfontein Sand Mine, Stilbaai
- Fresh Water Report CA Bruwer Feldspath Mine, Kakamas
- Sediment Yield Calculation, Kenhardt Sand Mine
- Wetland Demarcation, Grabouw Traffic Center
- Fresh Water Report, Osdrift Sand Mine, Worcester
- Fresh Water Report, Muggievlak Storm Water Canal, Vredenburg
- Fresh Water Report, Marksman's Nest Rifle Range, Malmesbury
- Biodiversity Report, Muggievlak Storm Water Canal, Vredenburg
- Strategic Planning Report, Sanitation, Afghanistan Government, New Delhi, India
- Fresh Water Report, Potable Water Pipeline, Komaggas
- Fresh Water Report, Wastewater Treatment Works, Kamieskroon
- Fresh Water Report, Turksvy Farm Dam, Upington
- Fresh Water Report, Groblershoop Urban Development, IKheis Municipality
- Fresh Water Report, Boegoeberg Urban Development, IKheis Municipality
- Fresh Water Report, Opwag Urban Development, IKheis Municipality
- Fresh Water Report, Wegdraai Urban Development, IKheis Municipality
- Fresh Water Report, Topline Urban Development, IKheis Municipality
- Fresh Water Report, Grootdrink Urban Development, IKheis Municipality
- Fresh Water Report, Gariiep Urban Development, IKheis Municipality
- Fresh Water Report, Bonathaba Farm Dam, Hermon
- Botanical Report, Sand Mine Greystone Trading, Vredendal
- Botanical Report Namakwa Klei Stene, Klawer
- Fresh Water Report Buffelsdrift Quarry, George
- Fresh Water Report Styerkraal Agricultural Development, Onseepkans.
- Technical Report Arabella Country Estate Wastewater Treatment Works, Kleinmond
- Fresh Water Report Calvinia Bulk Water Supply
- Fresh Water Report Swartdam Farm Dams, Riebeeck Kasteel
- Fresh Water Report Erf 46959, Gordon's Bay
- Fresh Water Report Melkboom Farm Dam, Trawal
- Stormwater Management Plan, Bot River Bricks
- Freshwater Report, Bot River Bricks
- Freshwater Report Sanddrif Farm, Joubertina
- Freshwater Report Zouterivier Cell phone tower, Atlantis
- Biodiversity Report Birdfield Sandmine, Klawer
- Freshwater Report New Wave Dam, Klawer
- Freshwater Report Harvard Solar Energy Plant, Bloemfontein
- Freshwater Report Doorn River Solar Energy Plant, Virginia
- Freshwater Report Kleingeluk Farm, De Rust
- Freshwater Report, Solar Energy Plant, Klein Brak River
- Site Verification Report Laaiplek Desalination Plant
- Freshwater Report, CA Bruwer Quarry, Kakamas
- Freshwater Report, Orren Managanese Mine, Swellendam
- Freshwater Report Bakentrant Boerdery, Kakamas
- Freshwater Report C & A van Niekerk Boerdery, Marchant
- Freshwater Report KTE Pipeline, Kenhardt
- Freshwater Report Delville Park, George
- Site Verification Report, Delville Park, George
- Freshwater Report Paballelo No1, Upington