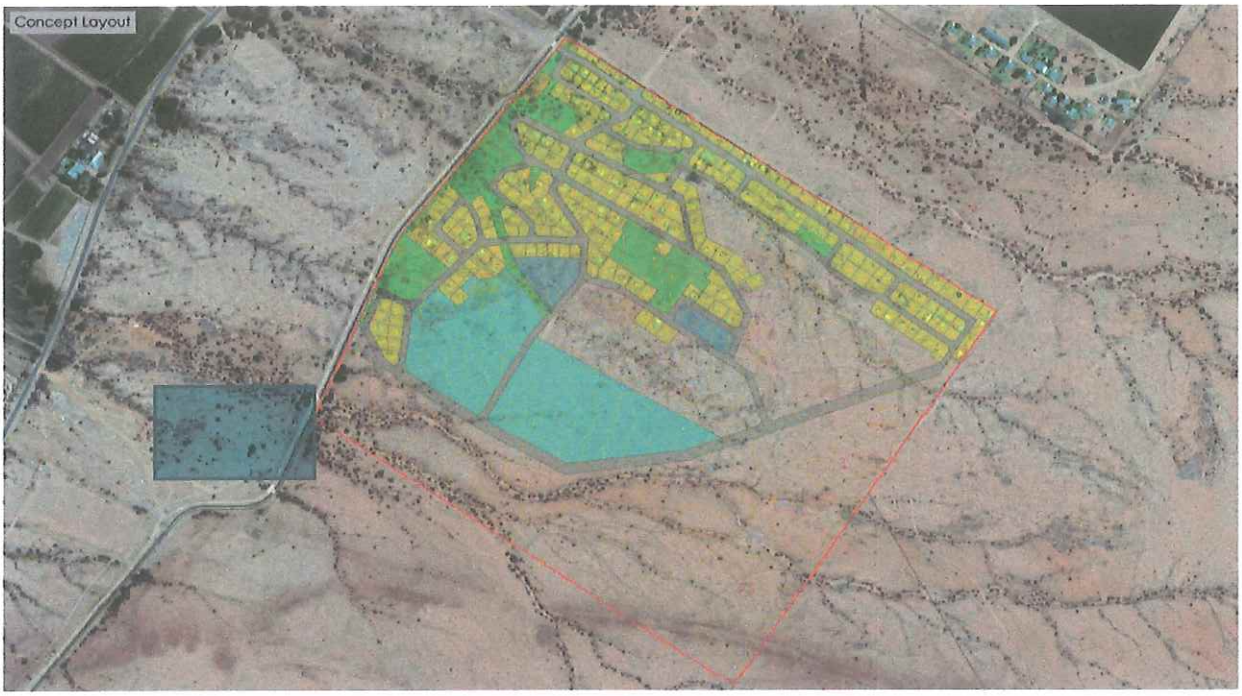
KAI! GARIB MUNICIPALITY



PLANGENI

CIVIL ENGINEERING SERVICES REPORT

SK3393

Prepared for:

Kai!Garib Municpality
P.O. Box 8
KEIMOES
8800
Tel: 054 461 6400
Fax: 054 461 6400
E-mail: admin@kaigarib.co.za

Prepared by:

Stabilis Development (Pty) Ltd
P.O. Box 861
KIMBERLEY
8300
Tel: 053 833 1654
Fax: 053 831 3786
E-mail: info@stabilis.co.za

FEBRUARY 2021

INDEX

Table of Contents

1. INTRODUCTION

The Barzani Group, on behalf of COCHSTA, appointed Mr Len Fourie of Macroplan in Upington to produce the plans and lay-out of several townships along the Lower Orange River, from Groblershoop to Keimoes and surrounds. The Plangeni settlement on the southern bank of the Orange River to the east of Keimoes and surrounds. The Plangeni settlemenmt on the southern bank of the Orange River to the east of Keimoes is one such development.

Macroplan appointed Stabilis Development (Pty) Ltd for the required Civil Engineering Services information.

2. BACKGROUND

Consideration is being given to the development of a new township, consisting of low-income housing, at Portion 30 of Farm Blaauwskop No. 36, Blaauwskop Settlement, Kenhardt Road, Kai !Garib Municipality, ZF Mgcawu District Municipality, Northern Cape.

The applicant is Kai !Garib Local Municipality who will undertake development responsible should it be approved.

The Coordinates for the proposed development are as follow:

Point	Coordinates
A	28°39'52.13S 21°05'50.89"E
B	28°40'10.69S 21°05'50.89"E
C	28°40'23.81S 21°06'12.90"E
D	28°40'05.51S 21°06'26.80"E

The locality drawings is attached as annexure A.

3. PURPOSE OF REPORT

The purpose of this report is to assist the application to register a township on the land for the planning of 500 residential sites. The absence of civil engineering services and possible development solutions for services are provided. The estimated development cost will be provided. The development of the land as a township will be done under the authority of Kai !Garib Local Authority.

4. GEOLOGY OF AREA

Very hard granite outcrops are visible on a large portion of the area. The granite is known as "Kanon Eiland Granite". The area is stable for house foundations, but the construction of underground services are expensive. The high percentage of hard rock excavation inflates the cost of services.

5. VEGETATION

The proposed site for the residential development is partly developed and has some natural vegetation present. According to the Vegetation map of South-Africa, Lesotho and Swaziland vegetation type is expected to be Bushmanland Ari. Bushmanland Arid Grassland is not considered threatened vegetation.

6. CLIMATE

Keimoes, the closest locality to Blaauwskop with on-line climate data, receives only 154mm of rain annually, which leaves the area semi-arid. The rainfall is entirely inadequate for growing crops. The large scale agriculture in the district is for all its needs dependant on irrigation out of the Orange River. Most of the rain is during summer. Rainfall often occurs in late afternoon sudden and violent electric thunder storms. Rainfall is highly variable, with occasional high rainfall events, perhaps once in a couple of years. Droughts are common, with dry periods lasting for years. The summers are hot and dry, with midday temperatures often more the 40° centigrade.

7. CIVIL ENGINEERING SERVICES

7.1 BULK SERVICES SUPPLY

The proposed development will require authorization under the National Water Act (Act no. 36 of 1998) to abstract water from the Orange River. The Department of Water and Sanitation, who administer the Act, will require an application. Include in the application an EIA for the construction work on the banks of the river will be required.

7.1.1 Water supply

No substantial bulk infrastructure exist for the proposed development.

The area is located next to an irrigation canal and 2,5km from the Orange River. The capacity of the irrigation canal is insufficient for the supply of sufficient raw water to the proposed development and the irrigation farmers. The canal is also each alternative 14 days "downtime".

The only sustainable abstraction will be from the Orange River. Servitudes over private owned land will be required.

7.1.2 External water demand

The external raw water demand will be calculated according to the standards supplied in" Guidelines for Human Settlements Planning and Design". The base of the information for the calculations are as follow:

- Proposed sites planned: 500
- Average household size: 4,8
- Population growth rate: 1%

- Planning period: 20 years
- Current population: 2400
- Future population: 2928
- Demand per person: 80ℓ/day

The demand calculation are as follow:

- Domestic demand 238,56 m³/day
- Municipal use and losses 15% 35,78 m³/day
- 20% over supply for external infrastructure 54,87 m³/day
- Purification losses 5% 16,46 m³/day
- **Total** **345,67 m³/day (350 m³/day)**

7.1.3 Purification and water storage

A purification plant with capacity of 350 m³/day is required for the proposed township. Water storage capacity will be based on the following:

- Ground water storage 72 hours
- Elevated storage 8 hours

The calculated storage to be provided is as follow:

- Ground storage 1050m³
- Elevated storage for peak demand 117m³

7.1.4 Domestic water distribution

For the design of the water distribution network the following principles will be applicable:

- PVC class 10 pipes
- Ring feeders must be maintained
- Minimum pressure under peak demand – 10m
- Peak factor – 4
- Underground network with a minimum cover on pipes of 600mm
- Maximum water velocity under peak demand conditions – 1m/s

7.1.5 Water demand management

The current water management policy of Kai !Garib Municipality will be implemented for the development. Each site will be supplied with a water management device. Free basic water will be supplied to the site until a consumption of 6m³ per month is reached. Slow supply of water will be available after 6m³ consumption until the end of the month or if additional water supply is purchase.

7.2 SANITATION

No sanitation infrastructure exists. Currently no policy is applied to the area because the formal planning is not completed.

The proposal for handling of waste water are:

- Grey water to be disposed on site
- Black water to be disposed on site utilizing VIP's or double put toilets.
- Septic tanks may be constructed, but the service cost of the tanks will be very expensive. The nearest waste water plant from Plangeni is Keimoes, 40km. Serious pressure will be put on the vacuum trucks of the municipality to accommodate the additional work. An additional vacuum tank will be required by the municipality.

7.3 ACCESS TO LAND

Access to the area is from a provincial road, R359 between Upington and Kakamas. The access road to the proposed residential area is provided with an interlocking paved road.

7.4 INTERNAL ROADS

The internal streets of the area will be graded gravel streets. The storm water run-off will be accommodated in the streets. Collector streets will be improved to supply a permanent surface (black or paved)

7.5 STORM WATER

The three drainage lines on the proposed area are mostly dry, with water only during rains and perhaps shortly thereafter. During the odd thunder storm, drainage lines can come down in flood. Because rainfall events are far apart, the flooding drainage lines is not an obstacle for the proposed development. Only two of the sub-catchments areas (no. 2 and 3) have an influence on the development of the residential area.

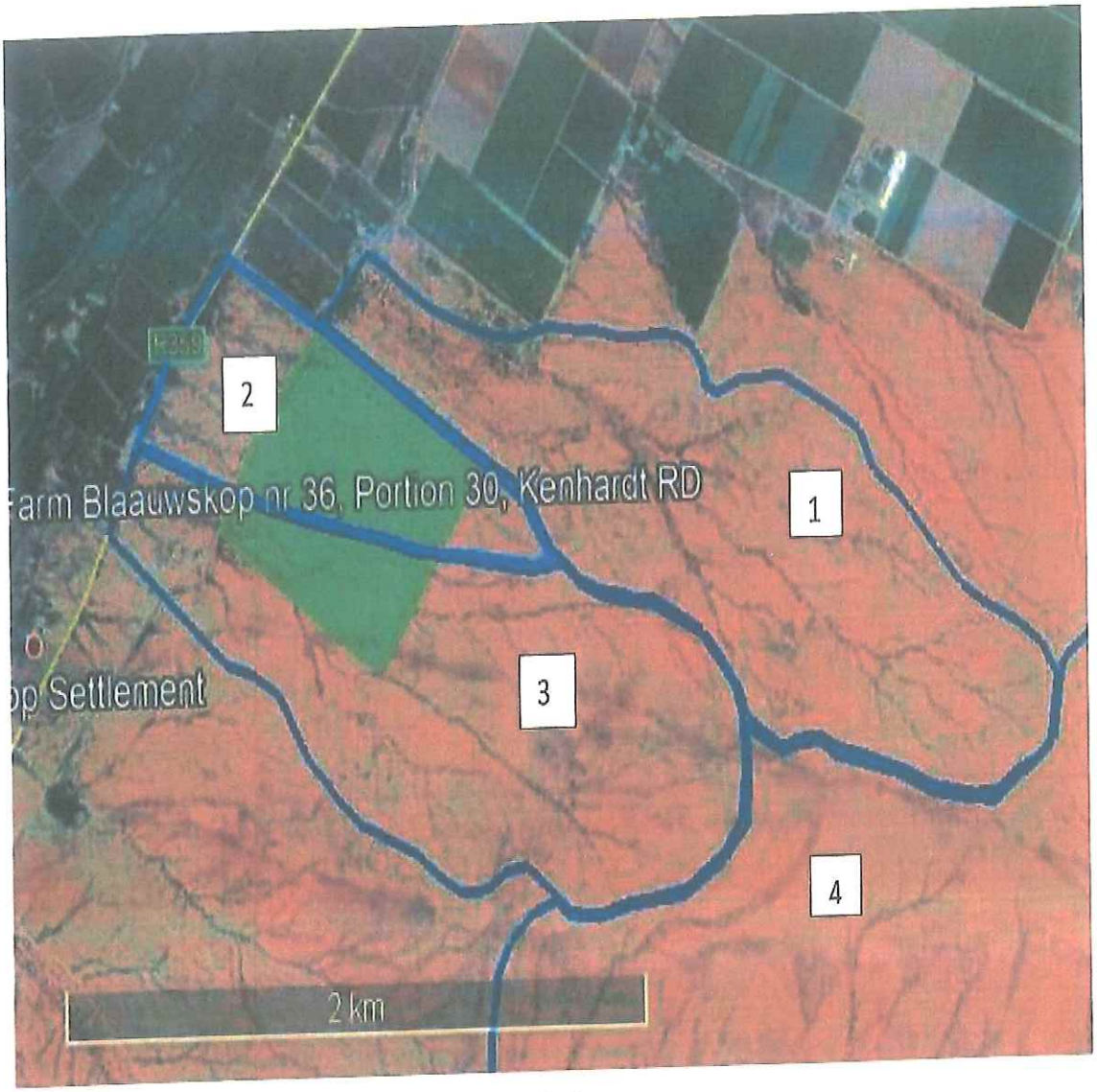


Figure 8 Catchment areas

+

No.	Area Ha	Circumference km	Highest Point masl	Lowest Point masl	Distance km	Slope
1	156	6.6	818	776	2.9	1.45
2	145	5.7	776	769	1.6	0.43
3	62	3.8	809	770	2.45	0.02
4	89380	153	1021	758	55	>0.01

The slope of sub-catchment 2 and 3 are only 0,02 to 0,43m drop over 100m. This slope ensure a run-off with a low velocity

The drainage lines pass over the irrigation canal with concrete slabs at each crossing. The run-off do not enter the canal. The town planning layout must accommodate the run-off lines. The storm water will be accommodated in the streets. This proposal will

ensure that no damage to private property will occur after heavy down poor. Additional storm water crossings over the canal are not foreseen.

7.6 SOLID WASTE REMOVAL

Kai !Garib Municipality did complete a feasibility study for the upgrading, development and application for permits from the Department of Water and Sanitation for solid waste removal sites. This process of upgrading is incorporated in the IDP of the municipality. Funding for the projects is from the MIG programme.

At Plangeni a small transfer facility will be required. Until this facility is established, all solid waste must be transported to the site in Kakamas. This site is the nearest facility with a permit.

7. GRAVEYARD

The town planning process will indicate a location for a graveyard. The development of the graveyard will be funded from the MIG programme after a permit for the site is received.

8. DEVELOPMENT STRATEGY AND COST

The provision of services for the Plangeni development is the responsibility of Kai !Garib Municipality. The proposed civil engineering services of the area will be incorporated in the IDP of the municipality. The IDP is updated each year, after negotiations with all communities in the jurisdiction area of Kai !Garib Municipality, the poverty for provision will contribute towards the timeless development of Plangeni.

The provision of services to address the backlog is done according to a three year development plan, compiled according to the yearly allocation to the municipality through the MIG programme. Funding from a different source will contribute towards the funders development of Plangeni.

A cost indication for the backlog in civil engineering services at Plangeni are as follow:

- External water supply	R 3 858 230.00
- Water purification and storage	R 6 950 000.00
- Water network	R 3 162 500.00
- Site connections with management device	R 2 012 500.00
- Streets and storm water	R 2 415 000.00
- Solid waste transfer site	R 850 000.00

- Graveyard development	R 2 500 000.00
	R 21 748 250.00
- VAT 15%	R 3 262 327.52
- **TOTAL**	**R 25 000 000.00**

9. EMERGENCY SERVICES

Households are already occupied sites on the area. Permanent and temporary structures are erected. The municipality was transporting potable water to the people over a distance of 10km. The potable water was stored in 5 000ℓ plastic tanks.

An emergency water supply and distribution project is currently under construction. The information of the project is as follow:

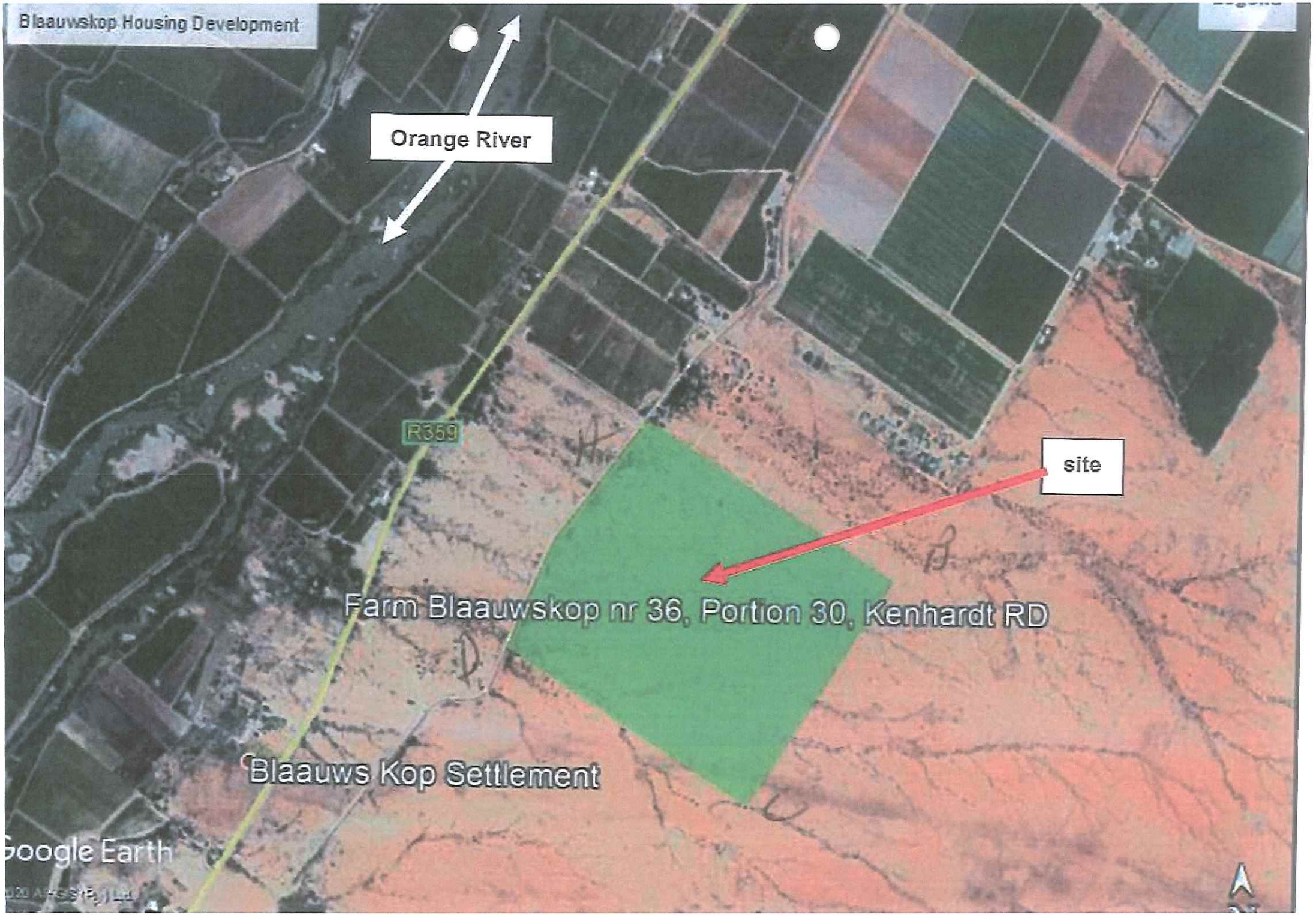
- Project no.:	MIG –SMIF/NC0691/W/2020
- Project amount:	R 2 848 369.25
- Water distribution network:	2646m of uPVC piping
- 5000ℓ tanks with standpipes:	15
- Water purification plant (Existing plant relocate from Bloemsmond:	1
- Raw water pump from irrigation canal:	2

J.H.C. THERON Pr. Eng.
STABILIS DEVLOPMENT (PTY) LTD

1. 3. 2021
DATE

ANNEXURE A

LOCALITY


Blaauwskop Housing Development
Orange River
R359
site
Farm Blaauwskop nr 36, Portion 30, Kenhardt RD
Blaauws Kop Settlement
Google Earth

ANNEXURE B

SLOPE OF AREA

SN 3393

KAI !GARIB MUNICIPALITY
CONCEPT TOWNSHIP ESTABLISHMENT

Design:	JP Theron (Pr. Pln. A/2394/2016)
Drawn:	JP Theron (Pr. Pln. A/2394/2016)
Date:	August 2020
Scale:	1:2000 (A1)

Plan is:

Concept Layout Plan
(DWG.TE) 200825 Blaauwskop/ Plangeni

Proposed Land Uses in terms of Land Use Management System

Colour & Numbers	Land Use Description	Total Units	Schedule of Sizes	Colour & Numbers	Land Use Description	Total Units	Schedule of Sizes
	Open Space Zone I				Undetermined Zone		
	Open Space Zone II	26			Business Zone I		
	Open Space Zone III				Business Zone II		
	Agricultural Zone I				Business Zone III		
	Agricultural Zone II				Business Zone IV		
	Resort Zone II				Business Zone V		
	Residential Zone I	501			Business Zone VI		
	Residential Zone II				Industrial Zone I		
	Residential Zone III				Industrial Zone II		
	Residential Zone IV				Industrial Zone IV		
	Residential Zone V				Industrial Zone IV		
	Residential Zone VI				Utility Zone I		
	Institutional Zone I	1			Utility Zone II		
	Institutional Zone II	3			Utility Zone III		
	Institutional Zone III				Transport Zone I		
	Authority Zone I				Transport Zone II		
	Authority Zone II				Transport Zone III		
	Special Zone			Total:		530	

Addisional Information:

- Contours
- Pipeline
- Sewerage Line
- Powerlines
- Buildings
- High Voltage Powerlines

Drawn:
MACROPLAN
TOWN & REGIONAL PLANNERS
JP THERON
PR.PLN A/2394/2015
T: 054 332 3642 • C: 082 821 1024
E: jptheron@mweb.co.za
Head Office
4A Murray Avenue, Upington 8801
Kimberley Office
4 Hemming Way, Kimberley 8301

Checked:
MACROPLAN
TOWN & REGIONAL PLANNERS
LEN J FOURIE
PR.PLN A/1052/2006
T: 054 332 3642 • C: 082 821 1025
E: manyplaz@mweb.co.za
Head Office
4A Murray Avenue, Upington 8801
Kimberley Office
4 Hemming Way, Kimberley 8301

Municipality:

KAI !GARIB

Postal Address:
Private Bag X6
Kakamas
8870

Tel No: 054 461 6700
Fax No: 054 461 6401

Client:

COGHSTA
Department:
Co-operative Governance
Human Settlements & Traditional Affairs
Northern Cape