

Locality Map 1:50000



Date created: 2024/06/12

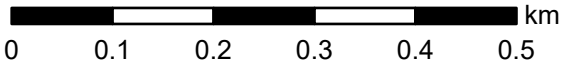


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Locality Map



Date created: 2024/06/12



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Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community



Critical Biodiversity Areas



Legend

- BSP CBA: Degraded
- CBA2: Terrestrial
- BSP CBA
- CBA: Wetland

Map Center: Lon: 22°28'42.1"E
Lat: 34°0'30.1"S
Scale: 1:4,514
Date created: 2024/06/12



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
CapeNature

Ecological Support Areas



Legend

- BSP ESA: Restore
- ESA2: Restore from other land use

Map Center: Lon: 22°28'42.1"E
Lat: 34°0'30.1"S
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CapeNature

Rivers



Legend

Rivers

- Perennial
- - Non-Perennial

Map Center: Lon: 22°28'42.1"E
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Wetlands



Legend

- Wetlands (NWM5)
 - River
- Wetlands (NFEPA)
 - Artificial

Map Center: Lon: 22°28'42.1"E
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SANBI Remnants



Legend

Red List of Ecosystems Remnants

■ Critically Endangered

Map Center: Lon: 22°28'42.1"E
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Date created: 2024/06/12



Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
South African National Biodiversity Institute

Vlok Vegetation Map



Legend

Vlok Vegmap - Variant VARIANT

- Groot Brak River Floodplain
- Herolds Bay Thicket-Grassy Fynbos
- Wolwedans Grassy Fynbos

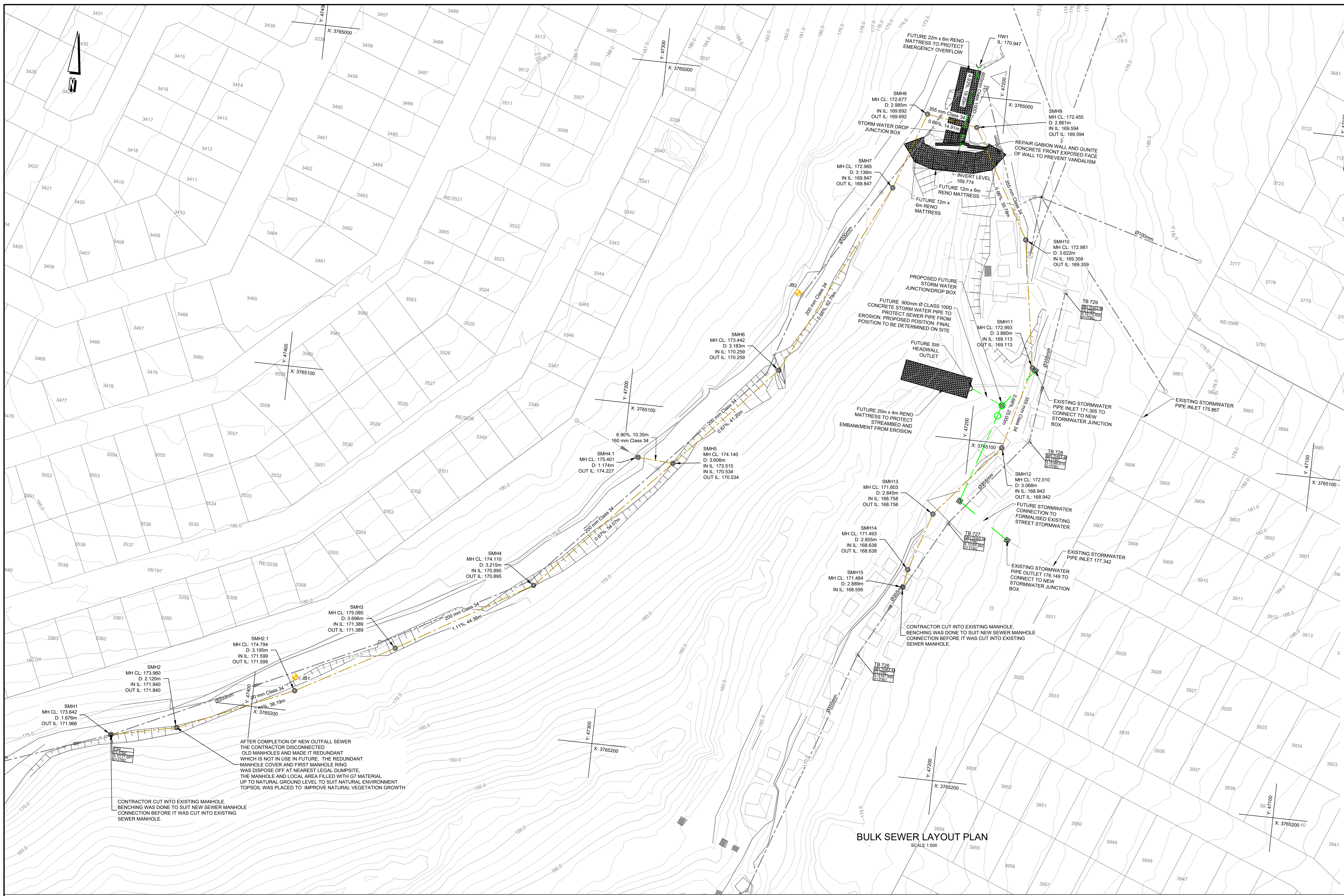
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Date created: 2024/10/09



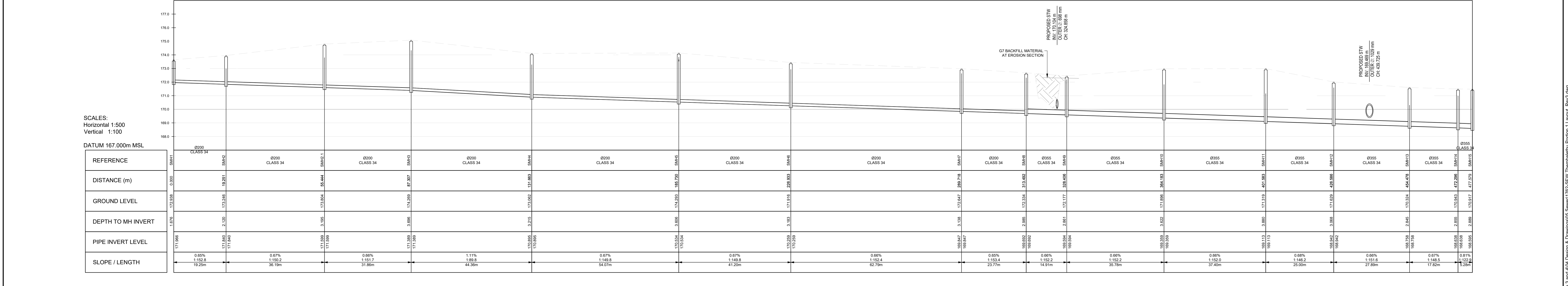
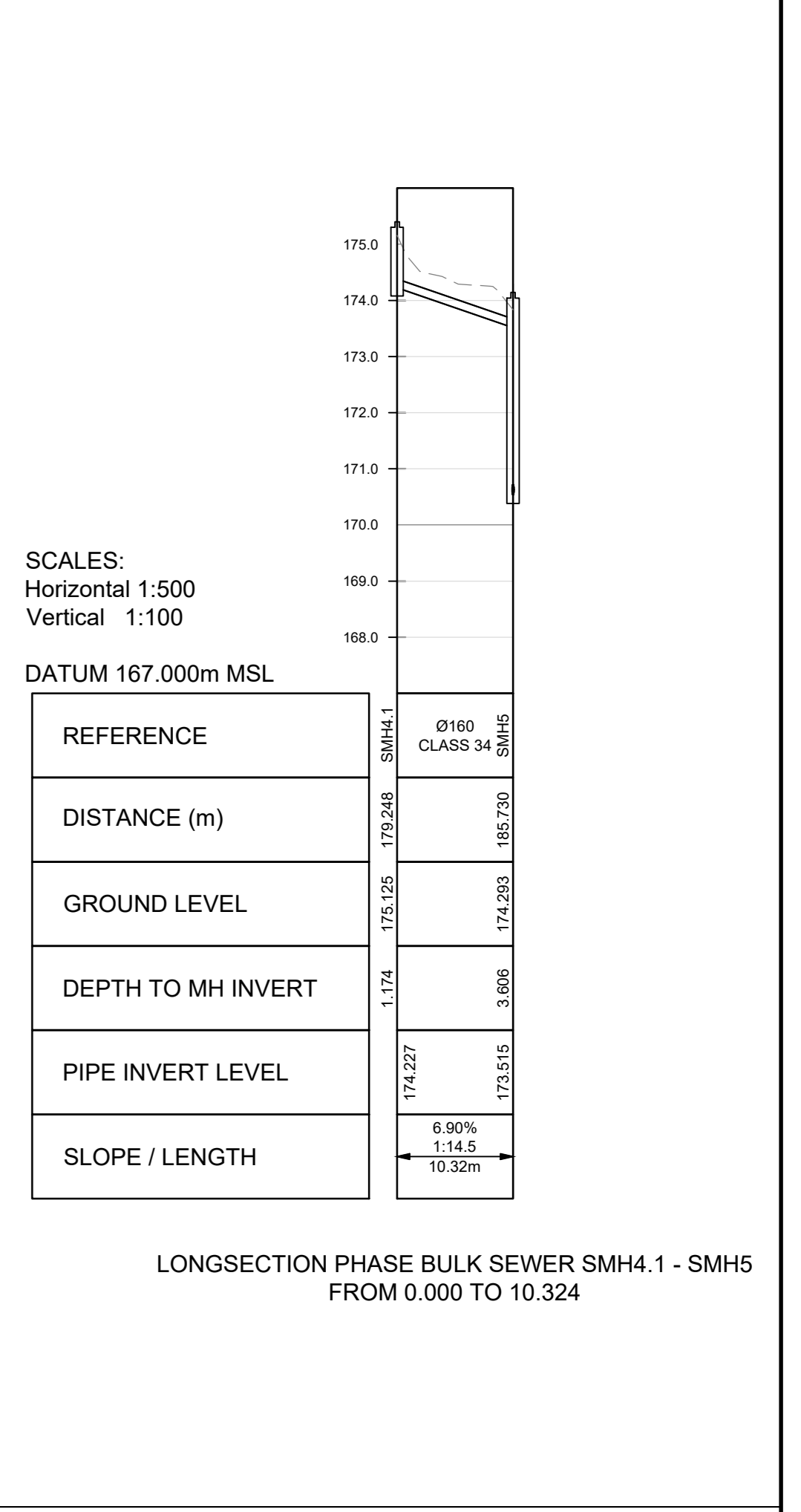
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STRUCTURE LIST-PHASE 1 BULK SEWER NETWORK

STRUCTURE NAME	Y	X	RIM ELEVATION	SUMP ELEVATION SUMP DEPTH	INVERT ELEVATION	MATERIAL
SMH1	47 499.935	3 765 212.827	173.842	171.965 1.876	P14-NV OUT 171.966	Upvc
SMH2	47 421.127	3 765 208.523	173.900	171.840 2.120	P14-NV IN 171.840 P3-NV OUT 171.840	Upvc
SMH2.1	47 387.598	3 765 194.084	174.794	171.599 3.195	P3-NV IN 171.599 P3 (4)-NV OUT 171.599	Upvc
SMH3	47 360.118	3 765 178.551	175.055	171.399 3.695	P3 (4)-NV IN 171.399 P4-NV OUT 171.389	Upvc
SMH4	47 321.955	3 765 155.944	174.110	170.895 3.215	P4-NV IN 170.895 P5-NV OUT 170.895	Upvc
SMH4.1	47 295.652	3 765 115.484	175.401	174.227 1.174	P29-NV OUT 174.227	Upvc
SMH5	47 285.350	3 765 116.154	174.140	170.534 3.605	P29-NV IN 173.515 P5-NV IN 170.534 P7-NV OUT 170.534	Upvc
SMH6	47 257.522	3 765 085.768	173.442	170.259 3.183	P7-NV IN 170.259 P8-NV OUT 170.259	Upvc
SMH7	47 230.263	3 765 029.209	172.965	169.847 3.138	P8-NV IN 169.847 P8 (5)-NV OUT 169.847	Upvc
SMH8	47 222.491	3 765 006.741	172.877	169.692 3.185	P8 (5)-NV IN 169.692 P10-NV OUT 169.692	Upvc
SMH9	47 207.759	3 765 009.063	172.455	169.594 2.861	P10-NV IN 169.594 P13-NV OUT 169.594	Upvc
SMH10	47 190.027	3 765 040.136	172.981	169.339 3.622	P13 (3)-NV IN 169.339 P13 (3)-NV OUT 169.339	Upvc
SMH11	47 184.070	3 765 077.059	172.993	169.113 3.880	P13 (3)-NV IN 169.113 P13 (1)-(1)(0) (4)-NV OUT 169.113	Upvc
SMH12	47 190.395	3 765 101.248	172.010	169.942 3.068	P13 (1)-(1)(0) (4)-NV IN 169.942 P13 (1)-(1)(0) (4)-NV OUT 169.942	Upvc
SMH13	47 208.306	3 765 122.630	171.603	169.758 2.845	P13 (1)-(1)(0) (4)-NV IN 169.758 P13 (1)-(1)(0) (4)-NV OUT 169.758	Upvc
SMH14	47 213.813	3 765 139.575	171.493	169.638 2.855	P13 (1)-(1)(0) (4)-NV IN 169.638 P13 (1)-(1)(0) (4)-NV OUT 169.638	Upvc
SMH15	47 214.685	3 765 144.786	171.484	169.595 2.889	P13 (1)-(1)(0) (4)-NV IN 169.595 P13 (1)-(1)(0) (4)-NV OUT 169.595	Upvc

- #### LEGEND
- EXISTING SERVICES
 - SEWER PIPELINE
 - STORMWATER PIPELINE
 - SEWER MANHOLE
 - FENCE LINE
 - GATE
 - SLOOT
 - BENCHMARK
 - PAVED ROAD
 - EXISTING ROAD
 - GABIONS AND RENO MATRESSES
 - PROPOSED SERVICES
 - SEWER PIPELINE
 - SEWER MANHOLE
 - STORMWATER PIPELINE
 - STORMWATER HEADWALL
 - GABIONS AND RENO MATRESSES
- #### GENERAL NOTES:
- SURVEY COORDINATE SYSTEM LO 23 HARTEBEESTHOEK 94.
 - ALL CONSTRUCTION WORK TO BE IN ACCORDANCE WITH THE RELEVANT SANS 1200 SPECIFICATIONS FOR CIVIL ENGINEERING CONSTRUCTION AS AMENDED BY THE SCOPE OF WORKS.
 - ANY CONSTRUCTION DETAILS NOT SHOWN ON THE DRAWINGS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE MUNICIPAL STANDARD DETAILS.
 - ALL SEWER CONNECTIONS TO BE Ø110mm uPVC CLASS 34 UNLESS OTHERWISE SHOWN OR REQUIRED.
 - IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCING WITH ANY EXCAVATIONS.
 - THE EXACT POSITIONS AND LEVELS OF ALL EXISTING SERVICES TO BE DETERMINED BY HAND EXCAVATION OR APPROVED LOCATION DEVICE BEFORE COMMENCING WITH CONSTRUCTION.
 - THE ENGINEER IS TO BE CALLED TO INSPECT ALL TRENCHES PRIOR TO ANY BACKFILL.
 - ALL MATERIAL TESTS FOR ALL CONSTRUCTION WORKS TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - ANY DISCREPANCIES TO BE BROUGHT TO THE ENGINEER'S ATTENTION IMMEDIATELY.
 - REFER TO DRAWING NO. 1762-GEN-002 FOR THE PHASE LOCALITY PLAN.
 - REFER TO DRAWING NO. 1762-GEN-002 FOR EXISTING SERVICES LAYOUT.
 - ALL SEWER GRAVITY PIPES TO BE 315mm HEAVY DUTY CLASS 34 FOR SEWER BULK COLLECTOR UNLESS OTHERWISE SHOWN OR REQUIRED.
 - SEWER MANHOLES ARE TO BE CONSTRUCTED USING 1.0m DIAMETER PRECAST RINGS TO DEPTHS IN ACCORDANCE WITH THE DESIGNS & DRAWINGS. MANHOLES DEEPER THAN 1.0m WILL BE REDUCED TO 0.75m WIDTH AT A DEPTH OF 1.0m. FOR DEPTHS GREATER THAN 4.0m TO A MAX. OF 6m DEEP BOTTOM PRECAST RING DIAMETER SHALL BE INCREASED TO 1.25m DIAMETER.
 - FINISHED COVER LEVELS:
 - CARRIAGEWAYS - COVER TO BE FLUSH WITH THE FINISHED ROAD SURFACE
 - ROAD RESERVE - COVER TO BE 50mm ABOVE THE FINISHED GROUND LEVEL
 - OPEN SPACES - COVER TO BE 500mm ABOVE FINISHED GROUND LEVEL



LONGSECTION PHASE 1 BULK SEWER NETWORK FROM 0.000 TO 477.579

REFERENCE	DISTANCE (m)	GROUND LEVEL	DEPTH TO MH INVERT	PIPE INVERT LEVEL	SLOPE / LENGTH
0+000	0.000	172.938	1.876	171.966	0.65%
0+050	50.000	173.548	2.102	171.446	1.16%
0+100	100.000	173.804	3.195	170.609	0.67%
0+150	150.000	173.804	3.696	170.108	1.14%
0+200	200.000	173.804	3.696	170.108	0.67%
0+250	250.000	173.804	3.696	170.108	1.14%
0+300	300.000	173.804	3.696	170.108	0.67%
0+350	350.000	173.804	3.696	170.108	1.14%
0+400	400.000	173.804	3.696	170.108	0.67%
0+450	450.000	173.804	3.696	170.108	1.14%
0+500	500.000	173.804	3.696	170.108	0.67%
0+550	550.000	173.804	3.696	170.108	1.14%
0+600	600.000	173.804	3.696	170.108	0.67%
0+650	650.000	173.804	3.696	170.108	1.14%
0+700	700.000	173.804	3.696	170.108	0.67%
0+750	750.000	173.804	3.696	170.108	1.14%
0+800	800.000	173.804	3.696	170.108	0.67%
0+850	850.000	173.804	3.696	170.108	1.14%
0+900	900.000	173.804	3.696	170.108	0.67%
0+950	950.000	173.804	3.696	170.108	1.14%
10+000	10000.000	173.804	3.696	170.108	0.67%

LEGEND

BOUNDARIES

- TOP OF BANK
- EXISTING FENCE
- EXISTING PROPERTY BOUNDARY
- EXISTING DRIVEWAY
- EXISTING DRIVE
- EXISTING GATE
- EXISTING DRIVEWAY
- EXISTING DRIVEWAY
- EXISTING DRIVEWAY
- EXISTING DRIVEWAY
- EXISTING DRIVEWAY

PROPOSED SERVICES

- PROPOSED FENCE
- PROPOSED DRIVEWAY
- PROPOSED DRIVEWAY
- PROPOSED DRIVEWAY
- PROPOSED DRIVEWAY
- PROPOSED DRIVEWAY
- PROPOSED DRIVEWAY
- PROPOSED DRIVEWAY
- PROPOSED DRIVEWAY
- PROPOSED DRIVEWAY

DATE

NO. REVISED

REVISIONS

DATE

BY

DESCRIPTION

DATE

BY

DESCRIPTION

DATE

BY

DESCRIPTION

APPROVED

DATE

2017/03/04

DATE: 2016/03/03

CONTRACT NO. / PROJECT NO. / DRAWING NO. / SHEET NO. / SHEET TOTAL

2017/03/04 / 2017/03/04 / 1762-SEW-002 / 1 OF 1 SHEETS / 1762-SEW-002

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REGISTERED ENGINEERS (PE/CE)

GEORGE LOCAL MUNICIPALITY

THEMBALETHU BULK SEWER PHASE 3 & 4

PORTION 2 BULK SEWER KEY PLAN



LAYOUT PLAN
SCALE: 1:1000



GEORGE MUNICIPALITY

PROJECT 20 (5): UPGRADING THEMBALETHU BULK SEWER – PHASE 3 AND 4

CONCEPT & VIABILITY REPORT

REPORT NO: 1762: REV NO. 1

3 MAY 2024

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GEORGE MUNICIPALITY

PROJECT 20 (5): UPGRADING THEMBALETHU BULK SEWER – PHASE 3 AND 4
CONCEPT & VIABILITY REPORT
REPORT NO: 1762 REVISION 1
3 MAY 2024

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DRAWINGS

Drawing No	Drawing Name	Rev
1762-GEN-001	Bulk Sewer Phase 3&4: Portion 1 - Locality Plan	0
1762-GEN-002	Bulk Sewer Phase 3&4: Portion 1 - Existing Services Layout	0
1762-GEN-004	Bulk Sewer Phase 3&4: Portion 2 - Existing Services Layout Plan	P0
1762-SEW-001	Bulk Sewer Phase 3&4: Portion 1 - Bulk Sewer Layout Plan	2
1762-STW-001	PORTION 1 : STREAM CROSSING, STORMWATER OVERFLOW AND STORMWATER DETAILS	0
1762-SEW-002	PORTION 2 BULK SEWER KEY PLAN	P0
1762-SEW-003	PORTION 2 BULK SEWER LAYOUT PLAN(SHEET 1 OF 7)	P0
1762-SEW-004	PORTION 2 BULK SEWER LAYOUT PLAN(SHEET 2 OF 7)	P0
1762-SEW-005	PORTION 2 BULK SEWER LAYOUT PLAN(SHEET 3 OF 7)	P0
1762-SEW-006	PORTION 2 BULK SEWER LAYOUT PLAN(SHEET 4 OF 7)	P0
1762-SEW-007	PORTION 2 BULK SEWER LAYOUT PLAN(SHEET 5 OF 7)	P0
1762-SEW-008	PORTION 2 BULK SEWER LAYOUT PLAN(SHEET 6 OF 7)	P0

Drawing No	Drawing Name	Rev
1762-SEW-009	PORTION 2 BULK SEWER LAYOUT PLAN(SHEET 7 OF 7)	P0
1762-SEW-010	TYPICAL SEWER DETAILS	P0
1762-STW-002	PORTION 2 : STREAM CROSSING AND STORMWATER DETAILS	P0

ANNEXURES

- Annexure A : Project Organogram
- Annexure B : Geotechnical Report
- Annexure C : Sewer Design Flows
- Annexure D : Civil Engineering Drawings



GEORGE MUNICIPALITY

PROJECT 20 (5): UPGRADING THEMBALETHU BULK SEWER – PHASE 3 AND 4
CONCEPT & VIABILITY REPORT
REPORT NO: 1762 REVISION 1
3 MAY 2024

1. INTRODUCTION

1.1 BACKGROUND

The purpose of this Concept and Viability Report is to establish George Municipality's requirements and preferences for the concept design for the upgrading of bulk sewer mains in Thembalethu in support of the Upgrading of Informal Settlements Programme (UISP). The Phase 3 and 4 bulk sewer mains are required to accommodate upstream flow as well as future housing developments to allow fully serviceable sites and the implementation of formal housing units in the identified areas. The proposed bulk sewer forms part of the overall bulk sewer upgrades required in Thembalethu as part of the Sanitation Master Plan.

The Municipality is placed under strain when dealing with the operation and maintenance of these sewerage systems due to constant blockages by foreign matter, not only causing a financial burden but resulting in environmental spillages and increased operation and maintenance requirement. The informal areas within Thembalethu currently do not have waterborne sanitation systems and a portion of this project will address these services allowing formal development of the area by extending the current bulk network to include areas that can easily be connected to the existing sanitation infrastructure. The existing upstream bulk sewers and pump stations will be utilised, where possible sewage will be conveyed through the new bulk sewer Phase 3 and 4 to the Outeniqua Waste Water Treatment Works (WWTW).

The bulk sewer will be implemented in a phased approach subject to available funding.

1.2 TERMS OF REFERENCE

George Municipality has appointed Lukhozi Consulting Engineers (Pty) Ltd as their professional engineering service provider for the Upgrading of Thembalethu Bulk Sewer Phase 3 and Phase 4.

The scope of services under the appointment is outlined below:

- Inception, concept design, detail design, documentation & procurement and implementation of Thembalethu Phase 3 and 4 bulk sewerage Infrastructure.
- Advise on criteria that could influence the project life cycle cost significantly.
- Provide the necessary information within the agreed scope of the project to other consultants involved.

- Provision of additional services required to develop and implement the project including construction monitoring.

1.3 PURPOSE OF THE REPORT

The purpose of this report is to provide details pertaining to the concept and viability planning, design, and implementation of Thembaletu Bulk Sewers- Phase 3 and 4.

This report outlines the recommended levels of services to be installed in conformance with the minimum design standards and requirements and, serves to establish the design criteria to be applied to the project.

1.4 PROJECT TEAM

The parties listed below will be involved in the planning, design and implementation of this project.

EmployerGeorge Municipality (GM)
Consulting Engineer Lukhozi Consulting Engineers Pty (Ltd)
Geotechnical Engineers Outeniqua Geotechnical Services
Engineering Surveyors Joubert & Brink Surveys (Pty) Ltd
Health and Safety AgentsXaks Consulting
Environmental Assessment Practitioner (EAP) Cape EAPrac

Refer to **Annexure A** – project organogram, for details of the Professional teams’ members.

2. SITE DETAILS

2.1 LOCALITY

Thembaletu is located within the jurisdictional boundaries of George Local Municipality of the Western Cape Province.

Coordinates of the centre of the area are 34°0'39.94" S & 22°28'38.70" E.

Access to Thembaletu is obtained via the Thembaletu interchange on the N2 national road from Knysna to Mossel Bay. The site spans along the western boundary of Thembaletu along the Schaapkop River. Access to the site is via Nelson Mandela Boulevard and residential roads, where available.

Refer to locality plan in **Figure 1** below.

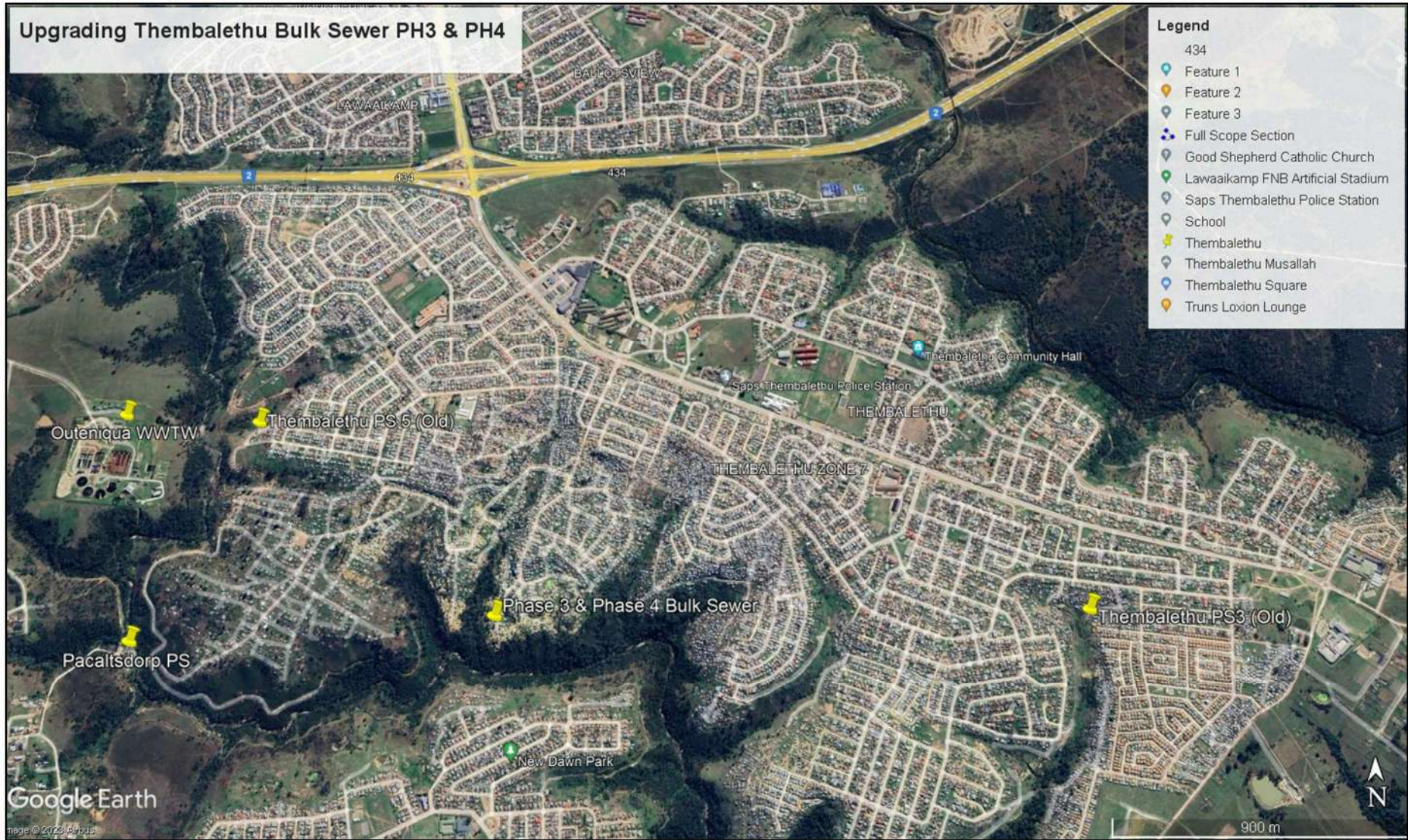


Figure 1: Locality of the planned Phase 3 & Phase 4 bulk sewer and decommissioned Thembalethu pump station no. 3

2.2 ENGINEERING SURVEY

Joubert and Brink Surveys were appointed as the engineering surveyor for this project. A LiDAR and Topographical survey were performed for areas being considered under the Thembaletu Bulk Sewers- Phase 3 and 4 scope of works. The engineering survey was completed, and the final information supplied to Lukhozi on 20 November 2023 and has been used in the concept & viability design.

2.3 GEOTECHNICAL INVESTIGATION

Outeniqua Lab and Geotechnical Services were appointed as the geotechnical engineering sub-consultant for this project. A geotechnical site investigation and report was prepared and submitted for areas being considered under the Thembaletu Bulk Sewers- Phase 3 and 4 scope of works. This is required to focus on identifying potential hazards, defining ground conditions, and offering detailed soil profiles and groundwater occurrence. The geotechnical site investigation was completed in December 2023 and the provisional soil test data was supplied on 14 December 2023. The final soil test and report was submitted on 1 February 2024. A copy of the geotechnical report is attached as Annexure B to this report.

Early indications from the soil test data show that the area will be suitable for the installation of sewers, with soils generally expected to be classified as 'soft excavation' over the majority of the route. Some trench shoring may be required in isolated areas with poor soil stability and dewatering of marshy areas may also be needed. These specifics will be confirmed through field and laboratory testing which will form part of the detailed geotechnical investigation report.

2.4 ENVIRONMENTAL INVESTIGATION

An Environmental Assessment Practitioner (EAP), Cape EAPrac, has been appointed to assess the Thembaletu Bulk Sewers- Phase 3 and 4 scope, and commence with the application to the Department of Environmental Affairs & Development Planning (DEA&DP), necessary permit/s with Department of Forestry, Fisheries and the Environment (DFFE) and necessary Water Use License Authorisation (WULA).

An existing environmental authorisation is in place for the implementation of various sanitation infrastructure in Thembaletu, including the Phase 3 & 4 bulk sewers. However, any change to the scope or alignment of the authorisation will require amendment.

The EAP, fresh water ecologist and other specialists undertook a site inspection on 1 November 2023, to determine the environmental sensitivity in relation to any potentially concerning environmental features.

CAPE EAPrac completed the Notice of Intent (NOI) and submitted it to the DEA&DP on 1 December 2023. A feedback letter with respect to the NOI letter was received from DEA&DP on 26 January 2024. The Department indicated that a Part 1 amendment to the existing Environmental Authorisation (EA) can be applied for if the proposed amendment will not change the scope of a valid environmental authorisation, nor increase the level or nature of the impact, which impact was initially assessed and considered when an application was made for an environmental authorisation; or relates to the change of ownership or transfer of rights and obligations. They further indicated that since the

proposed amendment (i.e. this Phase 3 & 4) will change the scope of the authorisation (i.e. new pipeline route not currently in the authorisation), regardless of what the reason is, a Part 1 amendment process cannot be followed for this change. DEA&DP is therefore of the opinion that a Part 2 amendment should be applied for instead.

Further environmental investigation and specialist studies will proceed as required by DEA&DP and a Part 2 amendment which will identify any environmental concerns that may affect the implementation of the Thembaletu Bulk Sewers- Phase 3 and 4 scope. This will be further addressed as the detail design stage will proceed.

Necessary adjustments to the designs will be made based on the final findings of the Basic Assessment if required.

3. **SCOPE OF WORKS**

3.1 **PORTION 2**

The Phase 3 and Phase 4 bulk sewers will serve the following areas that will tie into an existing 250mm Diameter bulk sewer line, situated south and south-east of the UISP Areas 5 & 6A and will gravitate to the existing Pacaltsdorp Sewer Pump Station 1. This pump station transfers the sewage to the Outeniqua WWTW, see Figure 2 below. This scope of work is seen as Portion 2.

During the detailed design stage it will be determined if the existing 250mm diameter bulk sewer line requires an upgrade to accommodate the new bulk sewer that will service Phase 3 and Phase 4 internal sewers.

Table 1: Portion 2 Estimated Bulk Gravity Sewers per concept design

Phase	Area	Anticipated Length	Planned Pipe Dia
3	Area 2 and the remainder of the bulk services required to fully service Area 5, 6A and 6B	Approx. 1460m	200mm (160mm was the proposed diameter per the Municipality's project appointment. This diameter is regarded as too small for bulk sewer reticulation for this area due to the small hydraulic loading and the nature and characteristics of the sewage)
4	Old All Brick Quarry Area	Approx. 970m	
Total estimated length of Planned Bulk Gravity Sewer		2 430m	

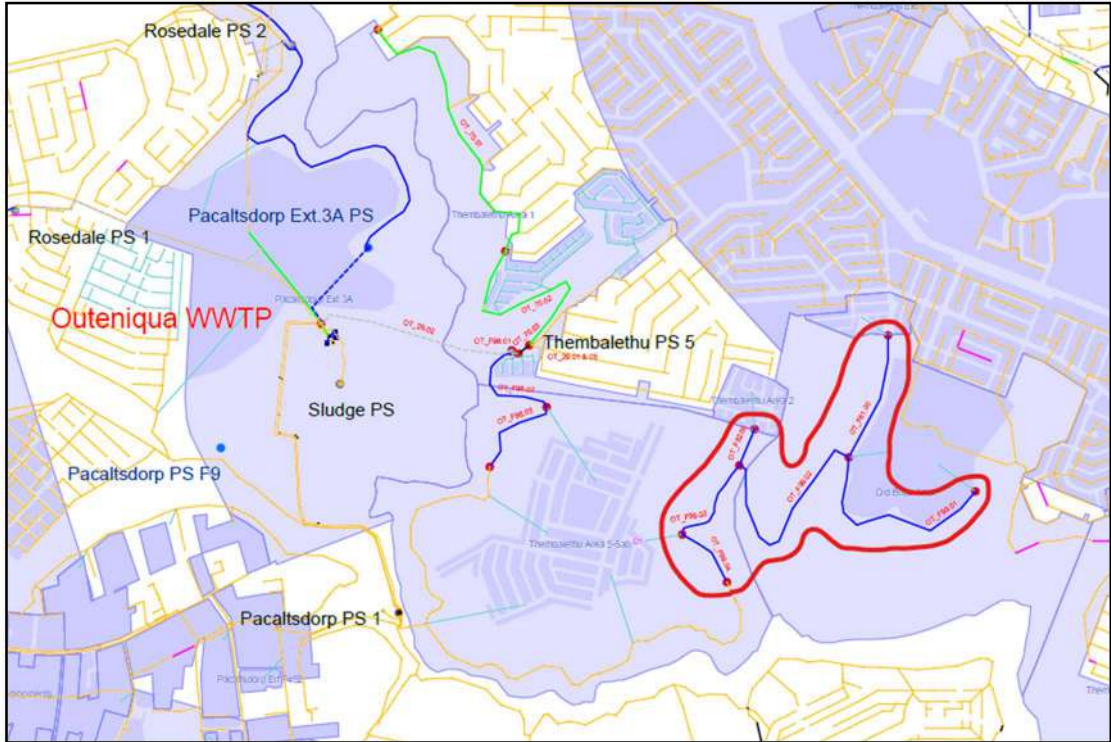


Figure 2: Portion 2 - Phase 3 and Phase 4 gravity bulk sewer (Outlined in red)

3.2 PORTION 1

A portion of the existing gravity sewer near the old, decommissioned Thembaletu sewer pump station no. 3 must be connected to the existing gravity sewer network to the western embankment of Ward 21 existing bulk sewer. This portion of the work is situated east of the planned Phase 3 and Phase 4 bulk sewer lines, but in totality creates the western bulk sewer line at this portion. Refer to Figure 3 below.

This portion of the scope of construction works will include the following as a minimum:

- Sewer connection to existing gravity sewer
- Stream crossing
- Construction of associated manholes
- Bulk earthworks and stabilization of erosion donga
- Stormwater crossing for future draining of Siyabulela and Eluxolweni Streets.

This scope of work is currently under construction, as part of T/ING/008/2020: The Appointment of Ad-Hoc Civil Engineering Contractors for a period of three years.

Table 2: Portion 1 Estimated Bulk Gravity Sewers per concept design

Portion	Area	Anticipated Length	Planned Pipe Dia
1A	Ward 9	316 m (200 mm Dia) 50 m (355 mm Dia)	200 mm and 355 mm Dia as per the existing pipeline with steeper falls of minimum 1 in 150
1B	Ward 21	120 m (355 mm Dia)	355 mm Dia as per the existing pipeline with steeper falls of minimum 1 in 150

Portion	Area	Anticipated Length	Planned Pipe Dia
Total estimated length of Planned Bulk Gravity Sewer for Portion 1		486m	



Legend:
— Existing bulk sewer with poor gradient
— New bulk sewer with min fall 1 in 150

Figure 3: Portion 1A&B Ward 9 & Ward 21 existing bulk sewer upgrade

4. WAYLEAVE APPLICATION STATUS

Planning wayleave applications to be submitted when applied for. Table 3 below indicates the status and outcome of each application.

Construction wayleaves will be applied for prior to commencing with construction by the applicable contractor/s.

Table 3: Wayleave Application Status

Service Provider	Service Affected	Comments
George: Electricity Department	Yes	Must be notified 5 days prior any construction. Electrical Representatives to inspect area prior excavation. Form to be filled out.
George: Civil Engineering Services	Yes	Sewer and water affected.
George: Environmental Services	Yes	Check if yellow woods or other protected trees will be in the way of new bulk sewer.

5. SUB-CONSULTANTS AND SPECIALIST SERVICE PROVIDERS

5.1 HEALTH AND SAFETY INVESTIGATION

George Municipality has appointed Xaks Consulting as the H&S Agent on 24 May 2023 for this project and will be involved during all required stages of the project.

The Health and Safety Agent is required to:

- a) Attend design meetings.
- b) Prepare baseline risk assessment and site-specific health and safety specification. A draft of the baseline risk assessment and site-specific health and safety specification was completed on 14 August 2023. This baseline risk assessment and site-specific health and safety specification will have to be reviewed and finalised during the compilation of the tender document for construction for portion 2. Review the bill of quantities to confirm there are sufficient items and acceptable quantities and pricing prior to and post pricing.
- c) Evaluate and approve the successful Contractor's Health and Safety Plan, which will be prepared in response to the risk assessment and specification.
- d) Prepare and apply for a Construction Work Permit if required.
- e) Attend monthly site meetings and perform monthly audits (minimum two site visits per month).
- f) Prepare and submit monthly Health and Safety audit reports.
- g) Manage the Contractor's compliance with his Health and Safety Plans, the Health and Safety Specifications and the OHS legislation.
- h) Prepare and submit a Health and Safety close-out report on completion of both construction contracts.
- i) Accept the duties and responsibilities of the Client as set out in the Construction Regulations.

6. CONCEPT DESIGN CRITERIA

6.1 STANDARDS APPLIED

The following references will be used for the design of the sewerage reticulation network:

- The Neighbourhood Planning & Design Guide: Section K - Sanitation (Red Book 2019)
- SANS 10400-P: Drainage
- George Municipality Civil Engineering Services: Civil Engineering Standards & Requirements for Services (Updated January 2009)

6.2 SEWER FLOW

The Instantaneous Peak Wet Weather Flows (IPWWF) for each of the drainage areas have been calculated using the sewer flow and peak factor method contained in section K.4 of the Human Settlements Planning and Design Guidelines (Red Book 2019). The following was allowed for in the design.

- Unit Hydrographs : UH 4 (PDDWF)
- Peak factor : 2.0 (IPDWF)

- Groundwater infiltration rate : 0.03 (l/min/m/m Ø)
- Allowance for stormwater ingress : 50 % (IPWWF)

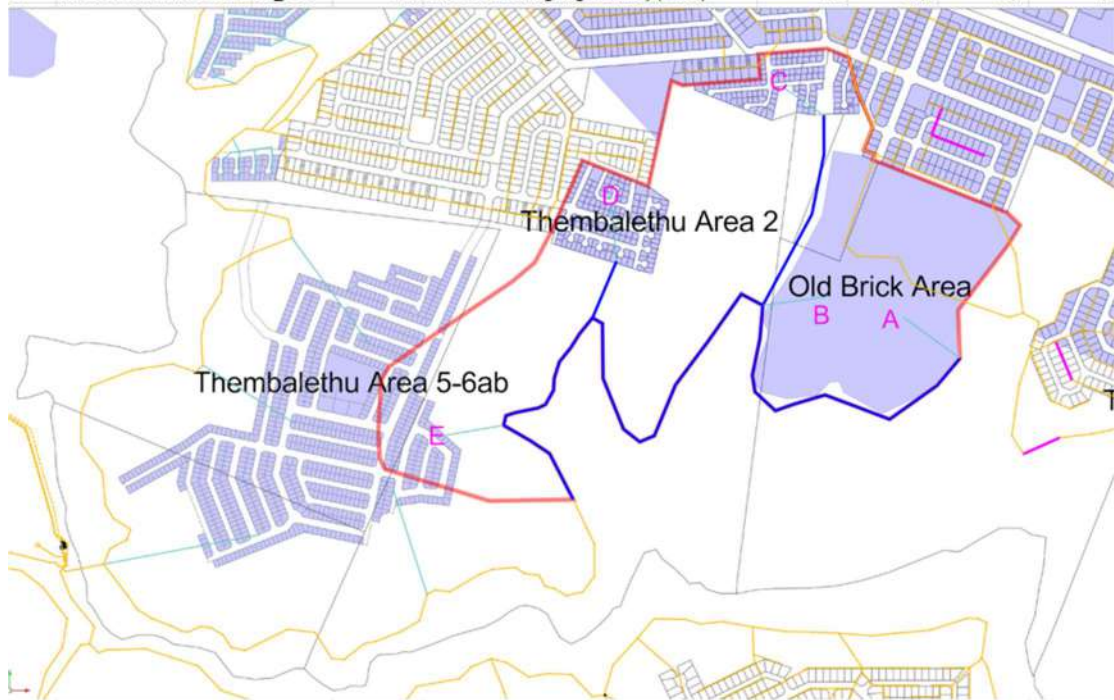
Refer to **Annexure C** attached to this Report for the design flow calculations for the bulk sewer as determined by Lukhozi.

6.2.1 Future Development flows

Table 4 provides a summary of the accumulated flows per drainage areas to a collection point that will drain via the proposed bulk sewers titled phase 3 and 4 in Thembaletu from the recent Sanitation Master Plan.

Table 4: GLS Design flows for Phase 3 and 4

Point	Future Development	Link Code	Portion	Landuse	Units	AADD (kl/d)	PDDWF (kl/d)	MP Design Flow (L/s)
A	Old Brick Area	FG_1120	50%	Low cost housing, very high density (G&W)	206	80,1	78,8	2,0
B	Old Brick Area	FG_1127	50%	Low cost housing, very high density (G&W)	206	80,1	78,8	2,0
C	Thembaletu Area 2	FG_0021	50%	Low cost housing, high density (G&W)	125	55,6	53,4	1,3
D	Thembaletu Area 2	FG_0035	50%	Low cost housing, high density (G&W)	125	55,6	53,4	1,3
E	Thembaletu Area 5-6ab	FG_0030	16%	Low cost housing, high density (G&W)	152	67,3	64,7	1,6



In accordance with the sanitation master plan, the theoretical design flows of the gravity sewer is indicated in **Table 5** below.

Table 5: GLS latest design flows for Phase 3 and 4

Drainage Area	Model Type	MP Item Type	MP Item No	Project No	Project Description	MP Description	Design Flow	Design Flow Unit
Outeniqua WWTW	Gravity	FM	OT_F81.00	RET_OT_060	Construct Thembaletu (2) outfall sewer	New Gravity	1.35	L/s
Outeniqua WWTW	Gravity	FM	OT_F82.00	RET_OT_060	Construct Thembaletu (2) outfall sewer	New Gravity	1.32	L/s
Outeniqua WWTW	Gravity	FM	OT_F99.01	RET_OT_061	Construct Old Brick Area outfall sewer	New Gravity	2.03	L/s
Outeniqua WWTW	Gravity	FM	OT_F99.02	RET_OT_060	Construct Thembaletu (2) outfall sewer	New Gravity	5.41	L/s
Outeniqua WWTW	Gravity	FM	OT_F99.03	RET_OT_060	Construct Thembaletu (2) outfall sewer	New Gravity	6.76	L/s
Outeniqua WWTW	Gravity	FM	OT_F99.04	RET_OT_060	Construct Thembaletu (2) outfall sewer	New Gravity	8.37	L/s

From the design flow calculations, as indicated by GLS, it can be seen that the future design flows are in the order of 1.3 to 2.0 l/s for the various areas with a maximum total design flow of 8.2l/s to 8.4 l/s. The design flow calculations as determined by Lukhozi (including an additional 50% stormwater infiltration) are in the order of 2.04 l/s to 6.75 l/s with a maximum total design flow of 13.5 l/s. The design flows are higher than the calculations as seen on GLS master planning reports, however this is mainly due to the high stormwater infiltration, of 50%, designed for by Lukhozi. When working on an average stormwater infiltration rate of 15% the flows compare closer with the flows as calculated by GLS i.e. in the order of 1.96 l/s to 5.2 l/s with a maximum total design flow of 10.35 l/s. We find the flows rates as calculated by GLS in a low design. It is necessary to determine the peak flow when sizing the proposed bulk sewer infrastructure and we therefore recommend the maximum design flow rate of 13.5l/s, as calculated by Lukhozi, be used for design purposes.

6.3 SEWERS

6.3.1 Bulk Sewer

The bulk sewers will be installed at an absolute minimum gradient of 1 in 150 per the Municipality's requirements.

The site is not a "greenfield" site since there are informal dwellings that exist along most of the planned bulk sewers proposed route. It can therefore be classified as "brownfield" site. This will mean some informal dwellings will have to be moved to temporary positions during construction to enable the installation of the bulk sewer pipelines as can be seen on the concept design layouts attached to the report. Refer to Annexure D. The exact scope of dwellings to be relocated is unknown and will be determined during detail design and the construction stages.

In addition to the extend of the informal dwellings that are restricting access and construction, benching of steep sloped areas will be required to allow access, and create workable platforms and allow maintenance of the bulk sewer pipelines in future. Sufficient allowance will be made in the tender document to perform this activity ahead of construction. Reinstatement and rehabilitation will be required of all disturbed areas.

The proposed bulk sewers will be positioned along the boundaries of existing informal areas, to allow drainage of the areas below gradients of 1 in 25. However, it will not be possible to drain all the existing informal dwellings. Some of these dwellings are developed at embankments steeper than 1 in 25, where the Municipality does not allow formal development. It is recommended, that these dwellings also be relocated to formal areas as part of the Thembalethu Upgrading of Informal Settlement Programme(UISP) for the area, by the Housing Department.

Single stop and go traffic lane will be created during construction to allow residents access to their properties during the construction phase. Re-instatement of existing roads, stormwater, water and sewer reticulation will form part of the works where required.

The anticipated length of bulk sewer and manholes to be constructed are indicated in Table 6 below.

Table 6: Summary of quantities

Phase	Estimated Sewer Pipe Length (m) / Dia (mm)	Estimated Manholes (No.)
3 (Pipeline A from SMH A34 to SMH A61 including pipelines B and C see drawings Annexure D)	Approx. 1470 (200mm Dia)	48
4 (Pipeline A from SMH A1 to SMH A34 see drawings Annexure D)	Approx. 970 (200mm Dia)	34
TOTAL	2 430	82
Portion 1A	316m (200mm Dia) 50m(355 mm Dia)	11
Portion 1B	120m(355 mm Dia)	6
TOTAL	486	17

6.3.2 Design

The bulk sewers are designed to the following standards:

- Minimum full pipe velocity : 0.7 m/s (due to the low design flows calculated velocities are as low as 0.4-0.5m/s)
- Maximum full pipe velocity : 2.2 m/s
- Minimum cover to pipes : 1.0 m below finished road level
0.8 m below finished ground level.
- Maximum depth : 4.0 m below finished ground level
- Maximum manhole spacing : 80 m
- Minimum pipe size : 200 mm diameter
- Minimum Erf Connection size : 110 mm diameter
- Minimum gradient sewer main : 1:150 (per George Municipality requirements)

The sewerage reticulation will be designed according to the minimum diameters and gradients shown.

6.3.3 Pipe Materials

Sewer mains will be uPVC Class 34 heavy-duty solid wall complying with SANS 1601, with a pipe stiffness of 400 kPa and smooth inner and outer walls complete with integral sockets, joints, and rubber seal rings.

All fittings will comply with SANS 791.

6.3.4 Manholes

Sewer manholes are to be constructed using 1.0 m diameter precast concrete rings to depths in accordance with the designs and drawings. Manholes deeper than 1.5 m will be reduced to 0.75 m diameter precast rings up to a depth of 1.5 m and 1.0 m diameter precast rings for the rest of the depth. Heavy duty precast concrete type manhole cover and frames will be used for all manholes constructed in the roadways. The manhole cover for sewers with diameter 315 mm Diameter and below will be standard concrete manhole covers. The

manhole cover for sewers with diameter above 355 mm Diameter will be specially made security concrete manhole covers to prevent the public from tampering with manholes.

Finished manhole cover levels will be flush with road level in roadways, 50 mm above finished ground level in road reserves and 500 mm above finished ground level in open spaces.

Precast manhole sections will comply with SANS 1294.

6.3.5 Main stream crossings

Due to the topography of Thembaletu and Skaapkop River that flow at the foot hills, various minor and main streams commence within the settlement until it reaches the river.

Because the proposed new gravity sewer follows the lowest possible contour line to obtain maximum drainage, three(3) main stream crossings will have to be crossed and accommodated in the design along the length of the bulk sewer pipelines. The sewer pipelines will have to cross these main stream crossings by means of a sewer pipe bridges as indicated on the layout and long section drawings.

It is proposed that the main stream and/or river crossings be constructed with reinforced concrete bridge structures. The detail for these crossings is shown on the stream crossings and stormwater detailed drawings found in Annexure D of this document.

The reasons for proposing reinforced concrete bridge structures are as follows;

- a) Concrete is renowned for its exceptional durability, with concrete exhibiting resistance to corrosion, fire, and external forces. They can withstand challenging environments and provide long-lasting service life, reducing maintenance and replacement costs.
- b) Concrete possess excellent structural strength, enabling it to bear heavy loads and resist deformation under pressure.
- c) Properly designed concrete mixes can be resistant to chemical attacks, such as sulphur or acidic substances, making them suitable for a wide range of applications, including sewer systems and industrial environments.
- d) Concrete offers a reliable and cost-effective solution due to its longevity and minimal maintenance requirements. It requires fewer repairs and replacements compared to alternative materials, resulting in reduced lifecycle costs.
- e) It is robust and will last for years as can be seen at other concrete pipe bridges in the Thembaletu area.
- f) The bridge structure can be designed in such a way that the bulk sewer pipe can be safely supported within the concrete bridge structure with concrete lids supported over its entire length. This can protect the pipe against vandalism and also allow pipe replacement by removing the concrete lids with lifting equipment should maintenance be required in future.

Steel bridge structures were considered but are not recommended due to the following reasons;

- a) Steel in the Thembaletu area is prone to vandalism and/or theft.
- b) Steel is not resistant to chemical attacks where leaks can occur, such as sulphur or acidic substances, making them unsuitable for this installation.

- c) The main disadvantage of steel bridges, compared to concrete, is that they corrode under the action of the atmosphere, easily rust, and have high maintenance costs, which are expensive in comparison to concrete bridge structures.
- d) Steel bridges have design limitations, which can make them unsuitable for certain applications, such as long-span bridges and high-load bridges.
- e) Some people may find steel bridges to be unattractive or visually intrusive, particularly in scenic or historic areas.
- f) Steel bridges require ongoing maintenance and inspections to ensure their safety and structural integrity over the long term.

Pipe and/or rectangular culverts are proposed for the minor stream crossings. The detail for these minor crossings will also be designed during the detailed design stage.

6.3.6 Minor stream crossings

Due to the topography of Thembaletu and Skaapkop River that flow at the foot hills, various minor and main streams commence within the settlement until it reaches the river.

Because the proposed new gravity sewer follows the lowest possible contour line to obtain maximum drainage, various minor stream crossings will also have to be crossed and accommodated in the design along the length of the bulk sewer pipeline. At these various minor stream crossings the sewer pipelines will have to be protected from being undermined or scoured away by stormwater by means of stormwater protection measures as indicated on the detail drawings.

Piping of stormwater is proposed above or below the new bulk sewer pipelines. The detail of these minor stream crossings is detailed under the drawings found in Annexure D of this document. The inlets and outlets to these stormwater piped structures will be protected by a combination of soil rip-rap, gabion baskets and reno mattresses where required, to prevent erosion. It is recommended that the exposed faces of these baskets and mattresses be protected by means of "shotcrete"/gunite from vandalism as well as theft experienced in the Thembaletu area.

6.3.7 Erf Connections

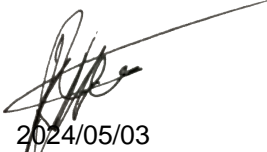
Erf connections (if/where required) will be constructed for each erf indicated on the drawings and will comprise of 110 mm uPVC pipe. Typically, erf connections extend 1.0 m into the erf boundary however, this is a brownfields project with established homes with concrete block boundary walls, fencing, retaining block walls etc. The Employer should therefore consider revising this standard to have the erf connection terminate just outside the boundary of the erf, to avoid any potential damage that may occur to this privately owned infrastructure.

Each erf will receive a single erf connection from the main sewer and where feasible, will be positioned in a manner that aligns itself with the existing sewers, septic / conservancy tanks (if any) to allow for ease of connection.

Female stop end pieces to be solvent welded to the ends of erf connection pipes after the required air testing has been carried out.

It is further recommended that the George Municipality:

- Confirm the funding availability.
- Approve this report and provide instruction to commence with the detailed design stage.



2024/05/03
KOENRAAD POTGIETER (Pr Tech Eng)
PROFESSIONAL ENGINEERING TECHNOLOGIST



08/05/2024
GREG TUCKER (Pr Eng, Pr CPM)
MANAGING DIRECTOR

for **LUKHOZI CONSULTING ENGINEERS (PTY) LTD**

LUKHOZI CONSULTING ENGINEERS (PTY) LTD

8 St John's Street

St John's Place

Dormehlsdrift

GEORGE

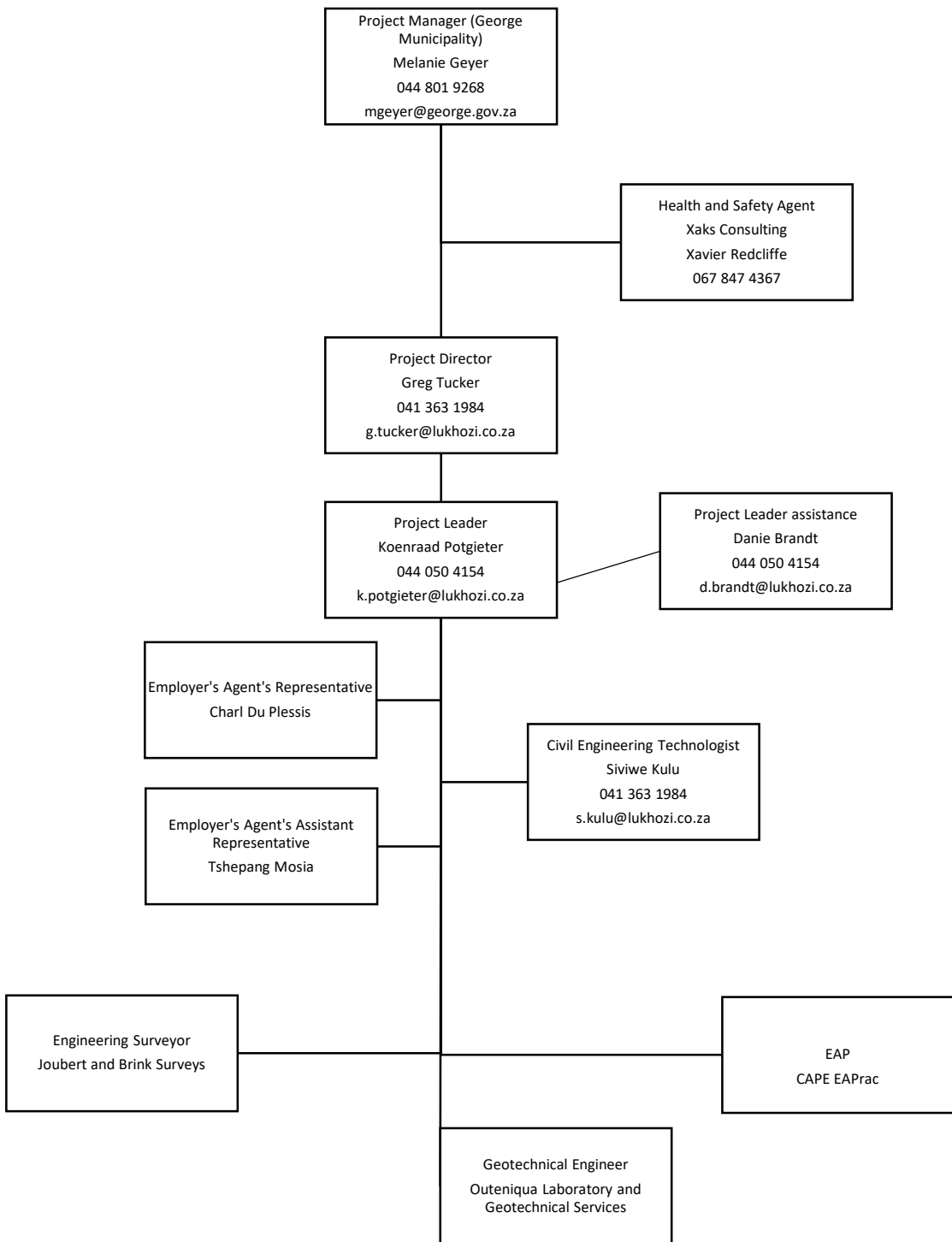
6529

www.lukhozi.co.za

Tel: 044 050 4154

Date: 3 May 2024

ANNEXURE A
PROJECT ORGANOGRAM





Land Management (Region 3)

REFERENCE: 16/3/1/1/D2/50/0060/12
ENQUIRIES: Shireen Pullen
DATE OF ISSUE: 2014 -03- 14

The Municipal Manager
George Municipality
Private Bag 19
GEORGE
6530



Attention: Mr. S. Erasmus

Tel: (044) 801 9111
Fax: (044) 873 3377

Dear Sir

CORRECTION NOTICE FOR THE ENVIRONMENTAL AUTHORISATION ("EA") ISSUED ON 4 MARCH 2014 FOR THE THEMBALETHU HOUSING AREAS 8 A&B AND THEMBALETHU BULK SERVICES

1. Please be informed that in terms of Section 47A(1)(b) of the National Environmental Management Act, 1998 (Act no. 107 of 1998, as amended) the description of the approved development on page 7 under Section B of the EA is hereby corrected to read as follows:

"The applicant is herein authorised to undertake the following alternatives related to the listed activities:

Formalisation of Area 8A&B (Erf 4056 & Erf 4055):

This authorization is only for the formalisation of 186 erven within Area 8A(Erf 4056) and 8B (Erf 4055) in Thembaletu appropriate to the Draft Subdivisional Plan for Areas 8A&B Alternative 1 – Preferred done by Delplan and dated January 2013. It entails the following:

- 181 residential erven;
- an erf for the existing Telkom tower;
- an erf for the existing crèche and church;
- an erf for the existing corner shop,

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93 York Street, George, 6529
tel: +27 44 805 8600 fax: +27 44 874 2423

Private Bag X6509, George, 6530

www.westerncape.gov.za/eadp

- two areas of public open space (one as a thoroughfare between two blocks of erven and one large area designated over the dam area).
- Internal road, water, sewerage, electrical and stormwater services/infrastructure.

Upgrade of Bulk Sewer Infrastructure:

Approximate to Plan No: 108429 GE 400 Rev 1, dated 13 November 2013, including:

- New bulk gravity and rising mains totalling a distance of approximately 12km to service for UISP Areas 1, 2, 3, 5, 6A&B, 7 and 8A,B &C;
- Upgrade of Pacaltsdorp No. 1 Pumpstation and Thembalethu No. 6 Pumpstation;
- Decommissioning of Thembalethu Pumpstations No. 3, 4 & 5 and associated rising main sewer lines; and
- Five pipe bridges over the Schaapkop River, as well as several stream / tributary crossings as detailed and defined by the Water Use License Application.

Installation of Bulk Electrical Powerline:

A 66kV overhead powerline, aligned from Kraaibosch area, south-east of Thembalethu Areas 4A and 4C to link to the authorised 66kV powerline running along the northern edge of Pacaltsdorp to the Protea Substation. This powerline is to cross over the Schaapkop River in two places."

2. Condition 5 of the EA must also be corrected to read as follows:

"This authorization is only for the formalisation of 186 erven within Area 8A (Erf 4056) and 8B (Erf 4055), the upgrade of bulk sewer infrastructure and the construction of a powerline. The proposed development will comprise of the following:

5.1 Formalisation of Area 8A&B (Erf 4056 & Erf 4055):

The proposed formalisation will take place in accordance with the Draft Subdivisional Plan for Areas 8A&B and with the preferred lay-out done by Delplan and dated January 2013. It entails the following:

- 5.1.1 181 residential erven;
- 5.1.2 an erf for the existing Telkom tower;
- 5.1.3 an erf for the existing crèche and church;
- 5.1.4 an erf for the existing corner shop,
- 5.1.5 two areas of public open space (one as a thoroughfare between two blocks of erven and one large area designated over the dam area).
- 5.1.6 Internal road, water, sewerage, electrical and stormwater services/infrastructure.

5.2 Upgrade of Bulk Sewer Infrastructure:

Approximate to Plan No: 108429 GE 400 Rev I, dated 13 November 2013, including:

- 5.2.1 New bulk gravity and rising mains totalling a distance of approximately 12km to service for UISP Areas 1, 2, 3, 5, 6A&B, 7 and 8A,B &C;
- 5.2.2 Upgrade of Pacaltsdorp No. 1 Pumpstation and Thembaletu No. 6 Pumpstation;
- 5.2.3 Decommissioning of Thembaletu Pumpstations No. 3, 4 & 5 and associated rising main sewer lines; and
- 5.2.4 Five pipe bridges over the Schaapkop River, as well as several stream / tributary crossings as detailed and defined by the Water Use License Application.

5.3 Installation of Bulk Electrical Powerline:

A 66kV overhead powerline, aligned from Kraaibosch area, south-east of Thembaletu Areas 4A and 4C to link to the authorised 66kV powerline running along the northern edge of Pacaltsdorp to the Protea Substation. This powerline is to cross over the Schaapkop River in two places."

- 3. Please ensure that reference is made to this correction notice in all future correspondence and that the notice is at all times attached to the environmental authorisation when distributed.
- 4. The Department apologise for any inconvenience caused.

Yours Faithfully



MR. KOBUS MUNRO

DIRECTOR: LAND MANAGEMENT (REGION 3)

DATE OF NOTICE: 14 March 2014

Copied to: Ms Siân Holder (Cape EAPrac)

Fax: (044) 874 0432



DIRECTORATE: LAND MANAGEMENT
REGION 3

EIA REFERENCE: 16/3/1/1/D2/50/0060/12
NEAS EIA REFERENCE: WCP/EIA/0001610/2014
EXEMPTION REFERENCE: 16/3/1/4/D2/50/0029/13
NEAS EXEMPTION REFERENCE: WCP/EIA/0001114/2012
ENQUIRIES: Shireen Pullen
DATE OF ISSUE: 2014-03-04



The Municipal Manager
George Municipality
Private Bag 19
GEORGE
6530

Attention: Mr. S. Erasmus

Tel: (044) 801 9111
Fax: (044) 873 3377

Dear Sir

APPLICATION FOR ENVIRONMENTAL AUTHORISATION AND EXEMPTION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2010: THE PROPOSED THEMBALETHU HOUSING AREAS 8 A&B AND THEMBALETHU BULK SERVICES

With reference to your application for the abovementioned, find below the outcome with respect to this application.

ENVIRONMENTAL AUTHORISATION AND EXEMPTION

DECISION

By virtue of the powers conferred on it by the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2010, ("NEMA EIA Regulations") the competent authority herewith **grants environmental authorisation and exemption** to the applicant to undertake the list of activities specified in section B below with respect to the preferred alternative described in the Final Basic Assessment Report ("final BAR") dated 25 November 2013.

The applicant is herewith exempted from the following provisions of the NEMA EIA Regulations:

Regulation 10(2)(d) of Government Notice No. R.543, which reads as follows:

10(2) *The applicant must, in writing, within 12 days of the date of the decision of the application*

4th Floor, 93 York Street, George, 6530 Private Bag X6509, George, 6530
tel: +27 44 805 8600 fax: +27 44 874 2423 www.westerncape.gov.za/eadp

(d) publish a notice –

(i) informing interested and affected parties of the decision;

(ii) informing interested and affected parties where the decision can be accessed; and

(iii) drawing the attention of interested and affected parties to the fact that an appeal may be lodged against the decision in terms of Chapter 7 of these Regulations, if such appeal is available under the circumstances of the decision,

in the newspapers contemplated in regulation 54(2)(c) and (d) and which newspaper was used for the placing of advertisements as part of the public participation process.

The granting of this environmental authorisation and exemption (hereinafter referred to as the "environmental authorization") is subject to compliance with the conditions set out in section E below.

A. DETAILS OF THE APPLICANT FOR THIS ENVIRONMENTAL AUTHORISATION

The Municipal Manager
George Municipality
% Mr. S. Erasmus
Private Bag 19
GEORGE
6530

Tel: (044) 801 9111

Fax: (044) 873 3377

The abovementioned Municipality is the holder of this environmental authorisation and is hereinafter referred to as "the applicant".

B. LIST OF ACTIVITIES AUTHORISED

Government Notice No. R544 of 18 June 2010 –

Activity Number: 9

Activity Description:

The construction of facilities or infrastructure exceeding 1000 meters in length for the bulk transportation of water, sewage or storm water -

(i) with an internal diameter of 0,36 meters or more; or

(ii) with a peak throughput of 120 liters per second or more,

excluding where:

a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or

b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.

Activity Number: 11

Activity Description:

The construction of:

- (i) canals;
- (ii) channels;
- (iii) bridges;
- (iv) dams;
- (v) weirs;
- (vi) bulk storm water outlet structures;
- (vii) marinas;
- (viii) jetties exceeding 50 square meters in size;
- (ix) slipways exceeding 50 square meters in size;
- (x) buildings exceeding 50 square meters in size; or
- (xi) infrastructure or structures covering 50 square meters or more

Where such construction occurs within a watercourse or within 32 meters of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.

Activity Number: 18**Activity Description:**

The infilling or depositing of any material of more than 5 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from

- (i) a watercourse;
- (ii) the sea;
- (iii) the seashore;
- (iv) the littoral active zone, an estuary or a distance of 100 meters inland of the high-water mark of the sea or an estuary, whichever distance is the greater- but excluding where such infilling, depositing, dredging, excavation, removal or moving:
 - (i) is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or
 - (ii) occurs behind the development setback line.

Activity Number: 23**Activity Description:**

The transformation of undeveloped, vacant or derelict land to –

- (i) residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or
- (ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; -

except where such transformation takes place for

- (i) linear activities;
- (ii) for purposes of agriculture or afforestation, in which case Activity 16 of Notice No. R. 545 applies.

Activity Number: 37**Activity Description:**

The expansion of facilities or infrastructure for the bulk transportation of water, sewage or storm water where:

- (a) the facility or infrastructure is expanded by more than 1000 meters in length; or
- (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more—

excluding where such expansion:

- (i) relates to transportation of water, sewage or storm water within a road reserve; or
- (ii) where such expansion will occur within urban areas but further than 32 meters from a watercourse, measured from the edge of the watercourse.

Activity Number: 40

Activity Description:

"The expansion of

- (i) jetties by more than 50 square metres;
- (ii) slipways by more than 50 square metres; or
- (iii) buildings by more than 50 square metres
- (iv) Infrastructure by more than 50 square metres

within a watercourse or within 32 meters of a watercourse, measured from the edge of a watercourse, but excluding where such expansion will occur behind the development setback line";

Activity Number: 56

Activity Description:

"Phased activities for all activities listed in this Schedule, which commenced on or after the effective date of this Schedule, where any one phase of the activity may be below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold; -

excluding the following activities listed in this Schedule:

- 2;
- 11(i)-(vii);
- 16(i)-(iv);
- 17;
- 19;
- 20;
- 22(i) & 22(iii);
- 25;
- 26;
- 27(iii) & (iv);
- 28;
- 39;
- 45(i)-(iv) & (vii)-(xv);
- 50;
- 51;
- 53; and
- 54".

Government Notice No. R546 of 18 June 2010—

Activity Number: 4

Activity Description:

The construction of a road wider than 4 metres with a reserve less than 13, 5 meters.

(d) In Western Cape:

- i. In an estuary;
- ii. All areas outside urban areas;
- iii. In urban areas:
 - (aa) Areas zoned for use as public open space within urban areas; and
 - (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose.

Activity Number: 13

Activity Description:

The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:

- (1) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from this list.
- (2) the undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No 544 of 2010.

d) In the Western Cape

- i. In an estuary;
- ii. Outside urban areas, the following:
 - (aa) A protected area identified in terms of NEMPAA, excluding conservancies;
 - (bb) National Protected Area Expansion Strategy Focus areas;
 - (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;
 - (dd) Sites or areas identified in terms of an International Convention;
 - (ee) Core areas in biosphere reserves;
 - (ff) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;
 - (gg) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.
- iii. In urban areas, the following:
 - (aa) Areas zoned for use as public open space;
 - (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;
 - (cc) Areas seawards of the development setback line;

(dd) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined.

Activity 16

The construction of:

- (i) jetties exceeding 10 square meters in size;
- (ii) slipways exceeding 10 square meters in size;
- (iii) buildings with a footprint exceeding 10 square meters in size; or
- (iv) infrastructure covering 10 square meters or more

where such construction occurs within a watercourse or within 32 meters of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line

(d) In Western Cape:

- i. All watercourses;
- ii. In an estuary;
- iii. Outside urban areas, in:
 - (aa) A protected area identified in terms of NEMPAA, excluding conservancies;
 - (bb) National Protected Area Expansion Strategy Focus areas;
 - (cc) World Heritage Sites;
 - (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;
 - (ee) Sites or areas identified in terms of an International Convention;
 - (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;
 - (gg) Core areas in biosphere reserves;
 - (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;
 - (ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.
- iv. Inside urban areas:
 - (aa) Areas zoned for use as public open space;
 - (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;
 - (cc) Areas seawards of the development setback line or within 100 metres of the high water mark where no setback line.

Activity Number: 24

Activity Description:

The expansion of

- (a) jetties where the jetty will be expanded by 10 square meters in size or more;
- (b) slipways where the slipway will be expanded by 10 square meters or more;

- (c) buildings where the buildings will be expanded by 10 square meters or more in size; or
- (d) infrastructure where the infrastructure will be expanded by 10 square meters or more

where such construction occurs within a watercourse or within 32 meters of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.

- i. In an estuary;
- ii. All watercourses;
- iii. Outside urban areas, in:
 - (aa) A protected area identified in terms of NEMPAA, excluding conservancies;
 - (bb) National Protected Area Expansion Strategy Focus areas;
 - (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;
 - (dd) Sites or areas identified in terms of an International Convention;
 - (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;
 - (ff) Core areas in biosphere reserves;
 - (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;
 - (hh) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined.
- iv. Inside urban areas:
 - (aa) Areas zoned for use as public open space;
 - (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.

Activity Number: 26

Activity Description:

Phased activities for all activities listed in this Schedule and as it applies to a specific geographical area, which commenced on or after the effective date of this Schedule, where any phase of the activity may be below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold.

All the areas as identified for the specific activities listed in this schedule.

The abovementioned list is hereinafter referred to as "the listed activities".

The applicant is herein authorised to undertake the following alternative related to the listed activities:

This authorization is only for the formalization of 186 erven within Area 8A(erf 4056) and 8B (erf 4055) in Thembaletu approximate to the Draft subdivisional Plan for Areas 8A&B Alternative 1:-Preferred done by Delplan and dated January 2013. It entails the following:

- 181 residential erven;
- an erf for the existing Telkom tower;
- an erf for the existing crèche and church;
- an erf for the existing corner shop,
- two areas of public open space (one as a thoroughfare between two blocks of erven and one large area designated over the dam area).
- The proposal also entails the upgrade of the bulk services approximate to Plan No: 108429 GE 400 Rev I dated 13 November 2013 including:
 - New bulk gravity and rising mains totaling a distance of approximately 8km, mainly to provide service for UISP Areas 1, 5, 6A, 6B and 2.
 - Upgrade to the Pacaltsdorp No.1 Sewer Pump Station as well as the Thembaletu No. 6 Sewer Pump Station.
 - decommissioning of Pumpstations 3 and 5 and installation of associated rising main sewer lines.
 - Several pipe bridges over the Schaapkop River or tributaries

C. PROPERTY DESCRIPTION AND LOCATION

The listed activities will take place on Erf 4056 (8A) and Erf 4055 (8B) Tyolora, which is located within the Thembaletu suburb, 3km south of the N2 national road.

The proposed bulk sewerage pipelines and associated infrastructure will be aligned predominantly on the edge of the Thembaletu residential settlement, along the edge and within the Schaapkop River valley to the south, which separates Thembaletu from Pacaltsdorp.

Co-ordinates:

POINTS ON SITE	LATITUDE	LONGITUDE
Revised starting point of the activity	34° 00' 51.76"S	22° 29' 39.95"E
Middle point of the activity	34° 00' 40.48"S	22° 28' 26.16"E
End-point of the activity	33° 59' 48.39"S	22° 27' 56.11"E
Area 8 A & B	34° 00' 46.81"S	22° 29' 30.41"E
River Crossing 1	34° 00' 46.57"S	22° 28' 58.87"E
River Crossing 2	34° 01' 10.97"S	22° 27' 46.10"E

hereinafter referred to as "the site".

D. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Cape EAPrac (Pty) Ltd.
 c/o Ms. S. Holder
 PO Box 2070
GEORGE
 6530

Tel: (044) 874 0365
 Fax: (044) 874 0432

E. CONDITIONS OF AUTHORISATION

1. This environmental authorisation is valid for a period of **five years** from the date of issue. The holder must commence with all the listed activities within

the said period or this environmental authorisation lapses and a new application for environmental authorisation must be submitted to the competent authority, unless the holder has lodged a valid application for the amendment of the validity period of this environmental authorisation, before the expiry of this environmental authorisation. In such instances, the validity period will be automatically extended ("the period of administrative extension") from the day before this environmental authorisation would otherwise have lapsed, until the amendment application for the extension of the validity period is decided. The listed activities, including site preparation, may not commence during the period of administrative extension.

2. The listed activities, including site preparation, may not commence within 20 (twenty) calendar days of the date of issue of this environmental authorisation. In the event that an appeal notice and subsequent appeal is lodged with the competent authority, the effect of this environmental authorisation may be suspended until such time as the appeal is decided.
3. The applicant must in writing, within 12 (twelve) calendar days of the date of this decision and in accordance with regulation 10(2)–
 - 3.1 notify all registered interested and affected parties of –
 - 3.1.1 the outcome of the application;
 - 3.1.2 the reasons for the decision as included in Annexure 1;
 - 3.1.3 the date of the decision; and
 - 3.1.4 the date of issue of the decision;
 - 3.2 draw the attention of all registered interested and affected parties to the fact that an appeal may be lodged against the decision in terms of Chapter 7 of the Environmental Impact Assessment Amendment Regulations, 2010 detailed in section F below; and
 - 3.3 draw the attention of all registered interested and affected parties to the manner in which they may access the decision.
4. Seven calendar days notice, in writing, must be given to the competent authority before commencement of construction activities.
 - 4.1. The notice must make clear reference to the site details and EIA Reference number given above.
 - 4.2. The notice must also include proof of compliance with the following conditions described herein:

Conditions: 2, 3, 9, 12 and 18
5. This authorization is only for the formalization of 186 erven within Area 8A (erf 4056) and 8B(erf 4055) in Thembaletu approximate to the Draft subdivisional Plan for Areas 8A&B Alternative 1:-Preferred done by Delplan and dated January 2013. It entails the following:
 - 5.1 181 residential erven;

- 5.2 an erf for the existing Telkom tower;
- 5.3 an erf for the existing crèche and church;
- 5.4 an erf for the existing corner shop,
- 5.5 two areas of public open space (one as a thoroughfare between two blocks of erven and one large area designated over the dam area).
- 5.6 The preferred alternative also includes the upgrade of the bulk services approximate to Plan No: 108429 GE 400 Rev 1, 13/11/13 (option 3) including:
 - 5.6.1 New bulk gravity and rising mains totalling a distance of approximately 8km, mainly to provide service for UISP Areas 1, 5, 6A, 6B and 2.
 - 5.6.2 Upgrade to the Pacaltsdorp No.1 Sewer Pump Station as well as the Thembaletu No. 6 Sewer Pump Station.
 - 5.6.3 Decommissioning of Pumpstations 3 and 5 and installation of associated rising main sewer lines.
 - 5.6.4 Several pipe bridges over the Schaapkop River or tributaries.
6. The holder is responsible for ensuring compliance with the conditions by any person acting on his/her behalf, including an agent, sub-contractor, employee or any person rendering a service to the holder.
7. Any changes to, or deviations from the scope of the description set out in section B above must be accepted or approved, in writing, by the competent authority before such changes or deviations may be implemented. In assessing whether to grant such acceptance/approval or not, the competent authority may request such information as it deems necessary to evaluate the significance and impacts of such changes or deviations and it may be necessary for the holder to apply for further authorisation in terms of the applicable legislation.
8. The applicant must notify the competent authority in writing, within 24 hours thereof if any condition herein stipulated is not being complied with.
9. The draft Environmental Management Programme ["EMP"] submitted as part of the application for environmental authorisation must:
 - 9.1. be amended to:
 - 9.1.1. incorporate the conditions of authorisation given in this Environmental Authorisation;
 - 9.1.2. include the removal of alien vegetation to co-incide with the end of the construction phase;
 - 9.1.3. The development of a long-term alien management plan after completion of the project which must include follow up removal of invasive alien vegetation and removal of any rubble at least twice a year for a period of not less than 10 years after construction;
 - 9.1.4. incorporate measures pertaining to the identification and allocation of environmental management roles, responsibilities and accountability, including timeframes for the implementation of the EMP;

9.1.5. make provision for the compilation of method statements that are to the satisfaction of the appointed Environmental Control Officer ("ECO");

9.1.6. be submitted to the Directorate: Land Management (Region 3) for consideration at least three weeks prior to the commencement of construction activities;

9.2. be approved by the Department before the commencement of any construction activities and

9.3. meet the requirements outlined in Section 24N (2) & (3) of the National Environmental Management Act, 1998 (Act no 107 of 1998, as amended) ("NEMA") and regulation 34 of the Environmental Impact Assessment Regulations 2010;

An application for amendment to the EMP must be submitted to the competent authority if any further amendments are to be made to the EMP, other than those mentioned above and approved by the competent authority, and this may only be implemented once the amended EMP has been authorised by the competent authority.

10. The applicant must compile and submit an Environmental Audit Report six months after commencement of construction and thereafter annually with the last report within 12 months after completion of construction activities. Such audit report must indicate the date on which construction activities were commenced with and when it was completed and detail compliance with the mitigation/rehabilitation measures and recommendations referred to in the EMP and conditions of this Environmental Authorisation.
11. Disturbance through the sensitive forest areas must be limited and this area must be demarcated with shade cloth "walling" above and below the work area.
12. A clearly demarcated working footprint must be established, prior to construction activities commencing and all areas outside the demarcated area must be treated as no-go areas.
13. A copy of the environmental authorisation and the EMP must be kept at the site where the listed activities will be undertaken. Access to the site referred to in section C above must be granted and, the environmental authorisation and EMP must be produced to any authorised official representing the competent authority who requests to see it for the purposes of assessing and/or monitoring compliance with the conditions contained herein. The environmental authorisation and EMP must also be made available for inspection by any employee or agent of the applicant who works or undertakes work at the site.
14. The applicant must submit an application for amendment of the environmental authorisation to the competent authority where any detail with respect to the environmental authorisation must be amended, added, substituted, corrected, removed or updated. Further, the rights granted by this environmental authorisation are personal rights (i.e. not attached to a

property, but granted to a natural or juristic person). As such, only the holder may undertake the activities authorised by the competent authority. Permission to transfer the rights and obligations contained herein must be applied for in the following manner:

- 14.1 The applicant must submit an originally signed and dated application for amendment of the environmental authorisation to the competent authority stating that he/she wishes the rights and obligations contained herein to be transferred, and including (a) confirmation that the environmental authorisation is still in force (i.e. that the validity period has not yet expired or the activity/ies was/were lawfully commenced with); (b) the contact details of the person who will be the new holder; (c) the reasons for the transfer; (d) an originally signed letter from the proposed new holder acknowledging the rights and obligations contained in the environmental authorisation and indicating that he/she has the ability to implement the mitigation and management measures and to comply with the stipulated conditions.
- 14.2 The competent authority will issue an amendment to the new holder either by way of a new environmental authorisation or an addendum to the existing environmental authorisation if the transfer is found to be appropriate.
15. Non-compliance with a condition of this environmental authorisation or EMP may result in suspension of this environmental authorisation and may render the holder liable for criminal prosecution.
16. Notwithstanding this environmental authorisation, the holder must comply with any other statutory requirements that may be applicable to the undertaking of the listed activities.
17. The holder must appoint a suitably experienced environmental control officer ("ECO") for the construction phase of implementation before commencement of any land clearing or construction activities to ensure compliance with the EMP and the conditions contained herein.
18. An integrated waste management approach, which is based on waste minimisation and incorporates reduction, recycling, re-use and disposal, where appropriate, must be employed. Any solid waste must be disposed of at a landfill licensed in terms of the applicable legislation.
19. No surface or ground water may be polluted due to any actions on the site. The applicable requirements with respect to relevant legislation pertaining to water must be met.
20. The applicable requirements with respect to relevant legislation pertaining to cutting, damaging, disturbing or destroying protected trees or trees from a natural forest must be adhered to.
21. The applicable requirements with respect to relevant legislation pertaining to occupational health and safety must be adhered to.

22. Should any heritage remains be exposed during excavations or any actions on the site, these must immediately be reported to the Provincial Heritage Resources Authority of the Western Cape, Heritage Western Cape (in accordance with the applicable legislation). Heritage remains uncovered or disturbed during earthworks must not be further disturbed until the necessary approval has been obtained from Heritage Western Cape. Heritage remains include: archaeological remains (including fossil bones and fossil shells); coins; indigenous and/or colonial ceramics; any articles of value or antiquity; marine shell heaps; stone artifacts and bone remains; structures and other built features; rock art and rock engravings; shipwrecks; and graves or unmarked human burials.
23. A qualified archaeologist must be contracted where necessary (at the expense of the applicant and in consultation with the relevant authority) to remove any human remains in accordance with the requirements of the relevant authority.

F. APPEALS

Appeals must comply with the provisions contained in Chapter 7 of the NEMA EIA Regulations.

1. An appellant must –

- 1.1. submit a notice of intention to appeal to the Minister, within 20 (twenty) calendar days of the date of the decision;
- 1.2. submit the appeal within 30 (thirty) calendar days after the lapsing of the 20 (twenty) calendar days contemplated in regulation 60(1), for the submission of the notice of intention to appeal; and
- 1.3. within 10 (ten) calendar days of having lodged the notice of intention to appeal, provide each person and organ of state registered as an interested and affected party in respect of the application, or the applicant, with –
 - 1.3.1. a copy of the notice of intention to appeal form; and
 - 1.3.2. a notice indicating where and for what period the appeal submission will be made available for inspection by such person, organ of state, or applicant, on the day of lodging it with the Minister, and that a responding statement may be made on the appeal within 30 (thirty) calendar days from the date the appeal submission was lodged with the Minister.
2. A person, organ of state or applicant who submits a responding or answering statement in terms of regulation 63 must within 10 (ten) calendar days of having submitted the responding or answering statement, serve a copy of the statement on the other party.
3. All notice of intention to appeal and appeal forms must be submitted by means of one of the following methods:

By post: Western Cape Ministry of Local Government, Environmental Affairs and Development Planning
Private Bag X9186
CAPE TOWN

8000

By facsimile: (021) 483 4174; or

By hand: Attention: Mr J. de Villiers Tel: (021) 483 3721
Room 809
8th Floor Utilitas Building,
1 Dorp Street, Cape Town, 8001

- 4. A prescribed notice of intention to appeal form and appeal form as well as assistance regarding the appeal processes is obtainable from the office of the Minister at: Tel. (021) 483 3721, E-mail Jaap.DeVilliers@westerncape.gov.za or URL <http://www.westerncape.gov.za/eadp>

G. DISCLAIMER

The Western Cape Government, the Local Authority, committees or any other public authority or organisation appointed in terms of the conditions of this environmental authorisation shall not be responsible for any damages or losses suffered by the holder, developer or his/her successor in any instance where construction or operation subsequent to construction is temporarily or permanently stopped for reasons of non-compliance with the conditions as set out herein or any other subsequent document or legal action emanating from this decision.

Your interest in the future of our environment is appreciated.

Yours faithfully



KOBUS MUNRO
DIRECTOR: LAND MANAGEMENT (REGION 3)

DATE OF DECISION:

4.3.2014

Copied to:

Ms Siôn Holder (Cape EAPrac)

Fax: (044) 874 0432

FOR OFFICIAL USE ONLY:	
EIA REFERENCE:	16/3/1/1/D2/50/0060/12
NEAS EIA REFERENCE:	WCP/EIA/0001610/2014
EXEMPTION REFERENCE:	16/3/1/4/D2/50/0029/13
NEAS EXEMPTION REFERENCE:	WCP/EIA/0001114/2012

ANNEXURE 1: REASONS FOR THE DECISION

In reaching its decision, the competent authority, *inter alia*, considered the following:

- a) The information contained in the application form dated 13 November 2013; the Basic Assessment Report (BAR) received by the competent authority on 27 November 2013 and the EMP submitted together with the BAR on 27 November 2013;
- b) Relevant information contained in the Departmental information base, including, the Guidelines on Public Participation, Alternatives and Exemptions (dated March 2013);
- c) The objectives and requirements of relevant legislation, policies and guidelines, including section 2 of the National Environmental Management Act, 1998 (Act No. 107 of 1998);
- d) The comments received from interested and affected parties and the responses provided thereon, as included in the BAR dated 25 November 2013.
- e) The sense of balance of the negative and positive impacts and proposed mitigation measures; and

A site visit was conducted on 11 February 2014 attended by Ms. S. Holder from Cape EA Prac, Mr. Danie Swanepoel from this Department and Mr. A. Molendorf from Aurecon.

All information presented to the competent authority was taken into account in the consideration of the application for environmental authorisation. A summary of the issues which, according to the competent authority, were the most significant reasons for the decision is set out below.

1. Exemption

Exemption from regulation 10(2)(d) was granted due to the small number of comments received during the public participation process. All registered interested and affected parties ("I&AP's) were notified of the exemption application, as required. No significant concerns were raised by I&APs in this regard.

As such, the exemption application was regarded as appropriate by the competent authority in this instance based on the adequate public participation process and the limited number of comments submitted with respect to the application.

2. Public Participation

The public participation process included:

- Identification of and engagement with interested and affected parties;
- Site Notices in English, Afrikaans and Xhosa were placed at the gate on Area 8 and along the main sewer alignment routes (visible to the public) on 10 and 11 February 2013 and 13 and 26 March 2013;

- Initial Notification Letters were sent on 10 and 11 February 2013 (in English and Xhosa), explaining the project, environmental process and the opportunity to register as Interested & Affected Parties (I&APs) were hand delivered by the EAP and Community Liaison Officer (CLO) to occupiers of Area 8 and directly adjacent neighbours of Area 8;
- Notifications sent to Ward Councillors, Stakeholders, State Departments & Organs of State detailing proposal and process on 18 February 2013;
- Hard copies of the Draft Basic Assessment Report (DBAR) were placed at the George Municipal offices (Planning Department, Progress Street) and Thusong Service Centre (located in Jeriko Street, Thembaletu), for a review & comment period of 40-days. The DBAR has also been made available on the Cape EAPrac website: www.cape-eaprac.co.za/active on 2 October 2013;
- Hard copies of this Final Basic Assessment Report (FBAR) have been placed at the George Municipal offices (Planning Department, Progress Street) and Thusong Service Centre (located in Jeriko Street, Thembaletu), for review & comment period of 21-days. The DBAR has also been made available on the Cape EAPrac website: www.cape-eaprac.co.za/active on 25 November 2013
- A newspaper advertisement was placed in the George Herald dated 31 January 2013.

No objections were received from I&APs and all the concerns raised by interested and affected parties were responded to and adequately addressed during the public participation process. Specific management and mitigation measures have been considered in this environmental authorization and in the EMP to adequately address the concerns raised. CapeNature submitted their support for the development of Areas 8 A&B, but does not support the encroachment of development into the remaining Afro Temperate forest patched and fynbos. The Department of Health did not have any objection to the proposed development. The Department of Agriculture, Forestry and Fisheries supports the development proposal subject to mitigation measures that includes amongst others that trenches in the forest must be hand-dug to disturb the forest as little as possible. This is unfortunately not possible, and mitigation measures such as strict demarcation with shade cloth "walling" above and below the area is included in the EMP.

This Department concurs with the environmental assessment practitioner's responses to the issues raised during the public participation process and has included appropriate conditions in this environmental authorization and in the EMP.

3. Alternatives

3.1 Development Lay-out Alternatives

Two possible layouts have been designed for the combined Area 8 (Erf 4056 & 4055) property, being:

3.1.1 Lay-out Alternative 1 (Preferred Lay-out) to be read together with the preferred sewer alignment alternative

This lay-out is proposed within 32 meters of the small dam on Area 8b. This layout proposes the formalisation of 186 erven, which include the following:

- 181 residential erven;

- an erf for the existing Telkom tower;
- an erf for the existing crèche and church;
- an erf for the existing corner shop,
- two areas of public open space (one as a thoroughfare between two blocks of erven and one large area designated over the dam area).
- Internal road, water, sewerage, electrical and stormwater services/infrastructure.

The findings of the ecological assessment of the dam revealed that it is not sensitive to disturbance and that the area would be acceptable for infill. Furthermore, the community wants the dam removed for safety reasons and therefore the proposal to reshape the dam area to allow for the removal of deep standing water and creation of an effective stormwater system within this area of open space. According to the BAR the formalisation of a stormwater channel will allow for the continued management of run-off from the property towards the tributary and river valley to the east.

3.1.2 Lay-out Alternative 2

According to the BAR this layout was design to restrict encroachment of erven into the 32m buffer of the small dam, with the partial overlap of six erven and a portion of an access road into this buffer. This layout proposes the formalisation of 173 residential erven; with the Telkom, crèche / church, corner shop erven and two public open space areas as described in the above layout. The proposal to retain the small dam as it is currently is included in this development proposal. Comment in this regard has been sought from the Department of Water Affairs. Considering the reduced number of residential erven, as well as the low ecological sensitivity and safety risk associated with the small dam, this alternative is not considered to be a desirable option.

3.2 Bulk Sewer Infrastructure Alternatives

Various other sewer infrastructure proposals/alternatives were investigated to solve some of the sewer service difficulties and demands. The proposed bulk sewer infrastructure, involves approximately 12km of sewer pipeline, the upgrade and decommissioning of sewer pumpstations, five (5) river crossings and several stream / tributary crossings, within the Schaapkop River Valley.

Activity Need and Desirability

It is submitted in the BAR that the existing Thembaletu bulk sewer system is overloaded, with blockages and leaks resulting in pollution and sewage spillage into the Schaapkop River, which is a common occurrence. In addition, the BAR further states that the lack of proper sewerage reticulation in the new and proposed formal extensions of Thembaletu UISP (over 4939 erven) and proposed Syferfontein Housing Project (7700 erven) would aggravate the current situation and generate a range of additional, environmental and health problems. The proposed development has been designed to rectify several of the constraints / problems experienced by the current system, while providing the necessary capacity to handle the new and proposed housing developments proposed for the area.

According to the BAR there is currently a need for the George Municipality to intervene as a matter of urgency in order to relieve the lack of services in the informal settlements and to prevent potential community unrest. The development proposal is thus not to create a new township, but rather to upgrade / formalise the *in situ* / existing informal settlement

area, as well as to provide the necessary internal bulk services required for the on-going formalisation of erven throughout Thembaletu.

The currently sewerage reticulation system for Thembaletu includes the following:
From pumpstation 4 sewage is piped through the township to pumpstation 3 and then to pumpstation 5, which pumps the sewage over River crossing 4 to the Outeniqua Waste Water Treatment Works.

The current proposal is to replace this system with new gravity lines on the edge of Thembaletu, that will feed into the Pacaltsdorp pumpstation 1 (which must be upgraded) and pumpstation 6 (which will also be upgraded). From pumpstation 6 the existing rising main will be augmented by a new rising main over the existing bridge crossing 1 over the Schaapkop River to the existing 800/700mm diameter bulk sewer gravity line that feeds pumpstation 1. This will result in the decommissioning of three existing pumpstations (3, 4 & 5) and the upgrading of two pumpstations (1 & 6)

Several infrastructure alternatives were considered, but most have been rejected by the Municipality due to higher cost (higher energy requirements and more pumpstations to maintain. These include the following:

3.2.1 Upgrading of Thembaletu Pumpstation No.3 and existing 200mm diameter rising main

This alternative was considered, since pumpstation 3 and associated 200mm-diameter rising main are currently at or over their design capacity, as well as its potential to open up an additional 700 erven (in Areas 3, 7 & 8) for development in the next housing phases. This alternative was decided against as it was not as financially effective as the preferred alternative.

3.2.2 Upgrading of pumpstation 3 and assisting the existing Rising Main from Pumpstation No.3 to the WWTW Alternatives

3.2.2.1 Alternative 1

A 3.8km-long, 250mm-diameter PVC-u rising main aligned to intersect the least existing services (water, sewer, stormwater, electrical and Telkom cables, roads and sidewalks) and high points (dark blue dotted line running approx. parallel to yellow line on drawing 108429GE 400 Rev.F). Due to the relatively high pumping head (powerful pumps) required for this line and the need to for an additional River Crossing No.4 (see below), this option was considered costly.

3.2.2.2 Alternative 2

Linked to the upgrade of Thembaletu Pumpstation No.5, this would require a 315mm-diameter rising main from Pumpstation No.3 to a point connecting to the proposed 350-400mm-diameter bulk gravity sewer proposed to drain Areas 5, 6A & 6B (orange dotted line below Old 'All-Brick' Works on drawing 108429GE 400 Rev.F). Although this option would be economical to operate, it would require a larger diameter bulk gravity line around Areas 5, 6A&B (to accommodate the increased flow), and the upgrade of Pumpstation 3.

Preferred option to be read together with the preferred sewer alignment alternative (Drawing 108429GE 400 Rev. I)

The preferred alternative includes two alternatives with two gravity lines, draining east and west of the 'All-Brick' property: **Orange line:** 200mm diameter line draining to the west of the 'All-Brick' property to link to the red gravity line, south of Area 6B; and **Blue line:** 250mm diameter line draining to the east of 'All-Brick' property along the same alignment of an existing sewer line to link to Option 1 (at the decommissioned Pumpstation No.3).

3.2.3 Upgrade of Pumpstation No.5

This alternative requires the demolition of the existing pumpstation building and that it be re-built at a position lower down the slope to allow the upgraded northern bulk sewer (draining Area 1) to gravitate to the new pumpstation. The upgrade would increase the flow-capacity from 15l/s to 180l/s, and entail a new inlet works, a new pumpstation building, new pumps and mechanical screens, a back-up generator and associated electrical reticulation upgrades, as well as some gabion works, a new access road, a telemetry system and a new fence.

3.2.4 River Crossing No.4 (In accordance with Drawing: 108429 REV 402 Rev C done by Aurecon)

This alternative entails the construction of a 50m concrete pipe-bridge across the Schaapkop River to accommodate a 450mm-diameter rising main servicing flows from Pumpstations 3 & 5 to the WWTW.

The option of re-aligning option 3 bulk gravity line from Area 8 to pumpstation 6 to avoid the remnant indigenous forest as recommended by the ecological specialist has been included in the revised activity proposal.

3.6 "No-Go" Alternative

The no-go alternative would result in Area 8A&B not being formalised and the bulk sewer infrastructure required for the greater Thembaletu UISP Housing Project not being built, which would give rise to a number of negative socio-economic, environmental and health impacts. The existing system is overloaded and blockages with sewage spills into the Schaapkop River is currently a common occurrence. The additional pressure on this existing system which the new extensions of Thembaletu are to create (i.e. UISP Areas 7 to 8) would not only aggravate the existing situation and the resultant pollution to this watercourse, but generate a range of environmental and health problems.

The no-go alternative is thus not considered desirable from both social and environmental perspectives (i.e. erosion, pollution and health & safety risks) and the proposed development can be viewed in a positive light when compared to the no-go alternative.

4. Impact Assessment and Mitigation Measures

4.1. Regional/ Planning Context

The proposed site (Erven 4056 and 4055, Tyolora) are registered in the name of George Municipality and are being utilised as an informal settlement at present. The site is currently zoned "Institutional I" (place of instruction) and will have to be rezoned to "Subdivisional Area" to allow for the establishment of infill development. According to the BAR the Western Cape Department of Education confirmed in writing that they do not

require the properties for educational purposes and consequently the land use has been transferred to George Municipality.

George is considered in the Provincial Spatial Development Framework ("PSDF") to be an area for high priority fixed investment urban settlement, with the formalisation of erven and provision of basic services to existing settlements. The Thembalethu settlement is one such area of focus.

The George Spatial Development Framework ("George SDF") includes this area within the urban edge. Infill development and densification is highly recommended in the document. The proposed development of Area 8A and 8B is infill development and therefore adheres to the principles for densification as described in the Western Cape Provincial Spatial Development Framework (WCPSDF)(June 2009), as well as the Draft George Spatial Development Framework. Existing services are utilised and additional costs for the upgrading of services are minimised.

The formalisation / upgrade of informal settlements (UIS) and provision of basic services are highlighted as a priority in the George Integrated Development Plan ("George IDP"). Thus this UIS Project aligns with the IDP forward planning into the future.

The Draft Thembalethu Spatial Development Plan ("TSDP") was compiled as a component of the Draft George SDF. This plan is being revised at present so that it can be approved as a local structure plan. This plan shows that the future growth and development of housing within Thembalethu must be managed through strategic infill and densification. Area 8A and 8B is indicated as a special area for re-development.

4.2. Services/ Bulk Infrastructure Internal Services for Area 8

The internal water, sewerage and stormwater reticulation networks will link to the existing Municipal services. Provision for effective stormwater drainage will be made by means of a combination of underground pipes and concrete lined V-drains running parallel to the roadways and discharging into the existing stormwater outlets surrounding Area 8 A&B. Energy dissipaters will be placed strategically to avoid erosion and additional runoff into the water courses, as well as litter traps to avoid this type of pollution entering these systems.

The old farm dam will be transformed to serve as an effective stormwater retention pond. A conventional stormwater network of catchpits, manholes and headwalls will convey stormwater generated on Area 8 into this retention pond, after which the stormwater will flow through an outlet pipe, discharging stormwater into the adjacent tributator via a stormwater outlet and silt retention structure, into the tributary to the east.

The services lay-out for Area 8 include a network of 10m wide internal roads, which gain access via the following three access points:

- off the existing Lingelethu Street (western property boundary),
- off the existing Makhaza Street (eastern property boundary), and
- via an existing road of 8m between existing erven 3810 & 3812 (northern property boundary).

Internal and linking electricity, water, sewerage and stormwater services will be aligned with the road network / road reserve as far as possible.

The solid waste generated by the current and future occupants of Area 8 will be picked up by the George Municipality and disposed of at a licenced Solid Waste Management/ Disposal Facility on a weekly basis.

4.3. Cumulative

Phase 8 A&B: The cumulative loss of currently intact habitat within listed vegetation types may impact the countries' ability to meet its conservation targets. The site is located within the Garden Route Granite Renosterveld vegetation type, which is listed as Endangered under the National List of Threatened Ecosystems and any further loss of this vegetation type would be considered highly undesirable. The extent of intact habitat at the site is however low and the amount of habitat that would be lost within these areas would be similarly low. In addition, the fragmentation of the surrounding landscape and the high anthropogenic impact in the area suggests that the long-term viability of the remnant patches is probably compromised.

Upgrade of bulk sewer services: Transformation within Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs") would potentially disrupt the functioning of the CBAs or result in biodiversity loss. In addition, the presence of the sewer line with access track will increase the fragmentation of habitat and increase access to a significant area of currently inaccessible areas which may have negative consequences for biodiversity in these areas due to increased levels of hunting or plant collection. The area is already highly fragmented and impacted and the sewer line will fragment the major unfragmented portion of the site.

However, the loss of biodiversity and a functioning ecosystem must be weighed up against the need to provide sewerage services. The lack of sewerage services will result in the pollution and potential health risk.

4.4. Biophysical Impacts

Upgrade of bulk sewer services: According to the BAR the site contains fynbos in proximity to the Old Brick Works and Afrotemperate Forest patches within the Schaapkop River valley. Although these areas are considered sensitive and retain significant biodiversity, the long-term viability and persistence of these areas is uncertain due to the high alien plant invasion pressure, as well as anthropogenic impacts such as hunting, livestock grazing and collection of plants for traditional medicine.

The forest patch area near Thembaletu No.6 Pump Station is considered to be most sensitive. The construction of the sewer access track will facilitate access to this area which currently represents relatively safe refuge for fauna and flora. A section of gravity pipeline has been re-aligned to avoid the sensitive indigenous forest patches in proximity to Pumpstation No. 6. However, the sewer line from Area 3 cannot be realigned to avoid the forest area, but it will be located high up on the slope as far as possible to minimise disturbance of the forest.

Phase 8 A&B: The small dam on Area 8 was found to be highly disturbed and thus not sensitive from an ecological perspective. Based on this assessment and the community's wish to have the dam removed due to safety risks associated with it (drowning), the preferred alternative thus included the option to maintain an area of open space around the dam site, remove deep standing water and formalise the dam into a functional stormwater management system. Some of the mitigation measures recommended

include a focus on avoidance of sensitive areas where possible and reducing the development footprint as far as possible, as well as ensuring that the construction approach results in a robust end result, which resists impacts such as erosion, since the long-term maintenance of the access tracks by the municipality is unlikely.

4.5. Biodiversity

The entire Schaapkop River and associated tributaries, to be traversed by the Bulk Sewer & Electrical infrastructure, is designated as a Critical Biodiversity Area ("CBA") and Ecological Biodiversity Area ("ESA"). Transformation within the ESA would potentially disrupt the functioning of the CBA and result in biodiversity loss.

The site is characterized by a few sensitive areas, which include CBA and Endangered Garden Route Granite fynbos and protected Afrotropical Forest patches. Although these areas are considered sensitive and retain significant biodiversity, the long-term viability and persistence of these areas is uncertain due to the high alien plant invasion pressure as well as anthropogenic impacts such as hunting, livestock grazing and collection of plants for traditional medicine.

The most sensitive area is forest patch near to the Thembolethu No.6 Pump Station. The construction of the sewer access track will facilitate access to this area, which currently represents a relatively safe refuge for fauna and flora. The report by Simon Todd Consulting recommends that an alternative alignment for the sewer line must be investigated, which avoids a greater portion of the forest, or if this isn't possible, building the line without the access track. The applicant proposes to use excavators, which disturb 5 meters during turning movements of the boom and bucket. Manual labour is impractical as the manhole rigs weigh 850kg each. The disturbance area will be rehabilitated to a maintenance access of 3,5 meters wide.

4.6. Visual / Sense of Place

According to the BAR the proposed development will have a positive local medium-term impact on the surrounding environment since it will result in the rehabilitation of some severely eroded sites, including pump stations along the routes.

4.7. Heritage

The heritage specialist indicates in his recommendations that the proposal constitutes infill development and that no heritage resources would be impacted through future development of the site and that no further heritage-related studies would therefore be necessary. Heritage Western Cape (HWC) as the competent authority in terms of the National Heritage Resources Act also confirmed in their final comment dated 26 June 2013, that no further processes in terms of Section 38 of the NHRA apply to the proposed development.

4.8. Socio-economic

According to the BAR the socio-economic impacts of the project, other than the employment opportunities to be created during construction and operation, include the provision of secure tenure on erven and access to basic services for the current informal residents or Areas 8A&B specifically. The BAR further submits that the provision of the bulk services component of this development proposal is to support the Upgrade of Informal Settlements Plan (UISP) for the greater Thembolethu area (Areas 1-8), and the socio-economic benefits of secure erven tenure and access to basic services associated with this.

4.9 Impact Assessment and significance

Overall, the impacts of the development of the bulk sewer infrastructure at Tembalethu are likely to be of local extent, moderate to low intensity and of overall low significance.

National Environmental Management Act Principles

The National Environmental Management Principles (set out in section 2 of the NEMA, which apply to the actions of all organs of state, serve as guidelines by reference to which any organ of state must exercise any function when taking any decision, and which must guide the interpretation, administration and implementation of any other law concerned with the protection or management of the environment), *inter alia*, provides for:

- the effects of decisions on all aspects of the environment to be taken into account;
- the consideration, assessment and evaluation of the social, economic and environmental impacts of activities (disadvantages and benefits), and for decisions to be appropriate in the light of such consideration and assessment;
- the co-ordination and harmonisation of policies, legislation and actions relating to the environment;
- the resolving of actual or potential conflicts of interest between organs of state through conflict resolution procedures; and
- the selection of the best practicable environmental option.

The development will result in both negative and positive impacts.

Negative Impacts:

This includes the disturbance of fynbos vegetation, disturbance of Afromontane forest and the transformation within the ESAs, which can potentially disrupt the functioning of the CBAs or result in biodiversity loss. In addition hereto, the presence of the sewer line with access tracks will increase the fragmentation of habitat and increase access to a significant area of currently inaccessible areas, which may have a negative effect on biodiversity in these areas due to increased levels of hunting or plant collection.

Notwithstanding the afore-mentioned, the negative impacts can partially be mitigated to low and very low levels by minimising the development footprint as far as possible and avoiding the creation of access tracks. The pipeline was also aligned as a mitigation measure to run on the edge of the Tembalethu settlement, along the edge and within the Schaapkop River valley to the south, separating Tembalethu from Pacaltsdorp.

Positive impacts:

The proposed development will result in the removal of the small dam on Area 8, which poses a safety risk. This dam will be formalised into a functional stormwater management system, which will in turn assist with the stormwater management in the area. Another positive impact of the proposed development is the alleviation of housing needs as the proposal includes the formalisation of informal housing in Areas 8A and B. The existing sewage system is overloaded and blockages with sewage spills into the Schaapkop River are currently a common occurrence and the approval of the proposed development will also eliminate this. This Department is therefore of the opinion that the positive impacts of

the proposed development largely outweighs the negative impacts and that the negative impacts can be mitigated to an acceptable level.

In view of the above, the NEMA principles, compliance with the conditions stipulated in this environmental authorisation, and compliance with the EMP, the competent authority is satisfied that the proposed listed activities will not conflict with the general objectives of integrated environmental management stipulated in Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and that any potentially detrimental environmental impacts resulting from the listed activities can be mitigated to acceptable levels.

-----END-----



water & sanitation

**Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA**

WESTERN CAPE REGION
PRIVATE BAG X16, SANDHAMPTON, 7531

Tel.: 021 941 6795, Fax: 086 579 4133, E-mail: Nthungenin@dwa.gov.za

Enquiry: N. Nthungeni
File number: 27/21/K232/113/06

George Local Municipality – Thembalethu Bulk Sewer System
P O Box 19
George
6573

Dear Sir/Madam

APPLICATION FOR WATER USE LICENSE APPLICATION IN TERMS OF SECTION 40 AND 41 OF THE NATIONAL WATER ACT, 1998 (ACT 36 OF 1998: IMPEDING OR DIVERTING THE FLOW OF WATER IN A WATERCOURSE: VARIOUS PROPERTIES

Your Water Use License Application has reference.

Attached please find the original Water Use License number 16/K30C/CI/2723 dated 15 December 2014 that was issued with regard to the above-mentioned application.

Please ensure that all conditions within the License are adhered to.

Water use charges or levies will be imposed from time to time by responsible authority or the Department in terms of the Raw Water pricing Strategy as published.

If you need further information, you are welcome to contact this office.

Yours faithfully

WESTERN CAPE: HEAD OF PROVINCIAL OPERATIONS
DATE: 19 January 2015



water & sanitation

Department
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Private Bag X315, Pretoria, 0001, Sedibeng Building, 185 Francis Baard Street, Pretoria.
Tel: (012) 336-7600 Fax: (012) 323-4472 / (012) 326-2715

LICENCE IN TERMS OF CHAPTER 4 OF THE NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998) (THE ACT)

I, **Anil Bijman Singh**, in my capacity as Director-General (Acting) in the Department of Water and Sanitation acting under authority of the powers delegated to me by the Minister of Water and Sanitation, hereby authorize the following water uses in respect of this licence.

SIGNED:

DATE: 15/12/14

LICENCE NO: 16/K30C/CU/2723
FILE NO: 27/2/1/K330/113/8

1. **Licensee:** George Local Municipality: Thembalethu Bulk Sewer System
P.O Box 19
GEORGE
6573
2. **Water Uses:**
 - 2.1 Section 21(c) of the Act: Impeding or diverting the flow of water in a watercourse, subject to the conditions set out in Appendices I and II.
 - 2.2 Section 21(i) of the Act: Altering the bed, banks course or characteristics of a watercourse, subject to the conditions set out in Appendices I and II
3. **Properties in respect of which this licence is issued.**
 - 3.1 Farm 7197/4 Tyolora
 - 3.2 Farm 7197/9, Tyolora
 - 3.2 Erf 3879, Tyolora
 - 3.3 Erf 5006, Tyolora
 - 3.4 Erf 3274, Tyolora
 - 3.5 Farm 7197/40 Tyolora

- 3.6 Farm 7197/50, Tyolora
- 3.7 Farm 7197/58 Tyolora
- 3.9 Portion 11 of the farm Sandkraal No 197
- 3.10 Farm 7197/4 Tyolora

4. Registered owner of the Properties

Table 1: Registered owner of properties

Farm 7197/40, Tyolora	T89142/07	George Municipality	34° 0'29.10"S 22°28'28.50"E
Erf 3274, Tyolora	T68142/07	George Municipality	34° 0'35.75"S 22°29'7.99"E
Farm 197/11, Sandkraal	T45867/89	George Municipality	34° 0'39.60"S 22°27'52.08"E
Farm 7197/9, Tyolora			34° 0'37.58"S 22°28'3.38"E
Farm 7197, Tyolora	T18564/69	George Municipality	34° 0'10.62"S 22°28'13.06"E
Farm 7197/4, Tyolora			34° 0'35.76"S 22°29'7.99"E
Farm 7197/50, Tyolora			34° 0'35.75"S 22°28'7.99"E
Farm 7197/58, Tyolora			34° 0'41.14"S 22°29'18.68"E
Erf 3878, Tyolora			34° 1'21.24"S 22°29'15.51"E
Erf 5006 Tyolora			34° 0'44.03"S 22°28'17.46"E

5. Licence and Review Period

- 5.1 This licence is valid for a period of twenty (20) years from the date of issuance and as provided for under Section 49 of the Act, it may be reviewed in every five (5) years after issuance.

6. Definitions

"Any word or term defined under the Act shall have the same meaning as defined in the Act, unless otherwise specifically stated"

"Provincial Head" The "Provincial Head" means the Head of Western Cape Provincial Operations, Department of Water and Sanitation, Private Bag X16; Sanlamhof, 7532

7. Description of activity

The water uses authorised for construction of sewer pipelines consist of impeding or diverting the flow of water and altering the bed, banks, course or characteristics of Schaeppkop River and its tributaries during the the construction of the sewer pipeline. The sewer pipeline will be situated within the Breeds-Gouritz Water Management Area, in quaternary catchment K300.

APPENDIX I

General conditions for the licence

1. This licence is subject to all applicable provisions of the National Water Act, 1998 (Act 36 of 1998).
2. The responsibility for complying with the provisions of the licence is vested in the Licensee and not any other person or body.
3. The Licensee must immediately inform the Provincial Head of any change of name, address, premises and/or legal status.
4. If the property/ies in respect of which this licence is issued is subdivided or consolidated, the Licensee must provide full details of all changes in respect of the properties to the Provincial Head within 60 days of the said change taking place.
5. If a Water User Association is established in the area to manage the resource, membership of the Licensee to the Association is compulsory. Rules, regulations and water management stipulation of such association must be adhered to.
6. The Licensee must be responsible for any water use charges and/or levies imposed by a Responsible Authority.
7. While effect must be given to the Reserve as determined in terms of the Act, where a lower confidence determination of the Reserve has been used in issuance of this licence, the licence conditions may be amended should a higher confidence reserve be conducted.
8. The licence shall not be construed as exempting the Licensee from compliance with the provisions of any other applicable Act, Ordinance, Regulation or By-law.
9. The licence and amendment of this licence are also subject to all the applicable procedural requirements and other provisions of the Act, as amended from time to time.
10. The Licensee must conduct an annual internal audit on compliance with the conditions of this licence. A report on the audit shall be submitted to the Provincial Head within one month of the finalization of the audit.
11. The Licensee must appoint an independent external auditor to conduct an annual audit on compliance with the conditions of this licence. Both these audits may be subjected to external audit.
12. If the water use authorised in this licence is not exercised within 3 years of the date of issuance of the licence, the authorization will be withdrawn. Upon commencement of the water use, the Licensee must inform the Relevant Authority in writing.
13. Notices prohibiting unauthorized persons from entering water use premises must be displayed.
14. The Department accepts no liability for any damage, loss or inconvenience, of whatever nature, suffered as a result of amongst other things:
 - 14.1 Inundation of flood;

- 14.2 Any *force majeure* event;
- 14.3 Siltation of the river or dam basin; and
- 14.4 Required Reserve releases.

APPENDIX II

Section 21(c) of the Act: Impeding or diverting the flow of water in a watercourse and/or

Section 21(i) of the Act: Altering the bed, banks, course or characteristic of a watercourse

1. GENERAL

1.1 This licence authorises George Local Municipality for the construction of a sewer pipelines within Schaapkop River and its tributaries for the Section 21(c) and (i) water use activities, for the Thambalethu bulk sewer infrastructure as set out in Table 2.

Table 2: Water use activities

River Crossing No.	Name of the water resources	Property Description (Farm/Erif Number)	Coordinates	Purpose
1	Tributary of Schaapkop River	Farm 7197 Tyolora	34° 0'10.62"S 22°28'13.06"E	Sewage pipeline river crossing
2	Tributary of Schaapkop River	Farm 7197/4 Tyolora	34° 0'22.92"S 22°28'7.49"E	Sewage pipeline river crossing
3	Tributary of Schaapkop River	Farm 7197/4 Tyolora	34° 0'30.96"S 22°28'4.16"E	Sewage pipeline river crossing
4	Tributary of Schaapkop River	Farm 7197/8 Tyolora	34° 0'37.56"S 22°28'3.38"E	Sewage pipeline river crossing
5	Tributary of Schaapkop River	Erif 5008 Tyolora	34° 0'43.73"S 22°28'10.41"E	Sewage pipeline river crossing
6	Tributary of Schaapkop River	Erif 5006 Tyolora	34° 0'44.03"S 22°28'17.48"E	Sewage pipeline river crossing
7	Tributary of Schaapkop River	Farm 7197/40 Tyolora	34° 0'29.10"S 22°28'26.50"E	Sewage pipeline river crossing
8	Tributary of Schaapkop River	Farm 7197/50 Tyolora	34° 0'27.09"S 22°28'1.20"E	Sewage pipeline river crossing
9	Tributary of Schaapkop River	Erif 3274 Tyolora	34° 0'35.75"S 22°28'7.89"E	Sewage pipeline river crossing
10	Tributary of Schaapkop River	Farm 7197/58 Tyolora	34° 0'41.24"S 22°28'19.68"E	Sewage pipeline river crossing
11	Schaapkop River	Erif 3878 Tyolora	34° 1'21.24"S 22°28'15.51"E	Sewage pipeline river crossing
12	Schaapkop River	Portion 11 of the farm Sandkraal No. 197	34° 0'39.60"S 22°27'52.08"E	Sewage pipeline river crossing
13	Tributary of Schaapkop River	Portion 11 of the farm Sandkraal No. 197	34° 0'32.12"S 22°27'43.37"E	Sewage pipeline river crossing
14	Tributary of Schaapkop River	Farm 7197/8 Tyolora	34° 0'16.67"S 22°27'58.09"E	Sewage pipeline river crossing
15	Tributary of Schaapkop River	Erif 3879 Tyolora	34° 1'17.42"S 22°28'22.20"E	Sewage pipeline river crossing
16	Schaapkop River	Farm 7197/6 Tyolora	34° 0'42.37"S 22°27'54.89"E	Sewage pipeline river crossing

- 1.2 The Licensee must carry out and complete all the activities listed under condition 1.1 according to the following:
 - 1.2.1. Reports submitted to the Department or the Responsible Authority, specifically:
 - 1.2.1.1. Water Use Licence Application (WULA) report compiled by Water & Wastes Utilisation Solution, November 2013.
 - 1.2.1.2. The conceptual drawings included in appendix E of the WULA report designed by Aurecon, October 2013
 - 1.2.1.3. Technical Report for Bulk Services compiled by Aurecon, August 2013.
 - 1.2.1.4. Draft Basic Assessment Report for upgrade of informal settlements project (UISP) – area 8a&b & bulk services on Erf 4056 & 4055 (Area 8A&B) compiled by Cape EAPrac Environmental Assessment Practitioners, September
 - 1.2.1.5. Ecological Assessment Report compiled by Simon Todd Consulting, September 2013.
 - 1.2.2. Reserve determination, dated June 2012;
 - 1.2.3. Environmental Authorisation; 4 March 2014 ;
 - 1.2.4. Conditions of this licence; and
 - 1.2.5. Any other written direction issued by the Provincial Head in relation to this licence.
- 1.3 No activity must take place within the 1:100 year flood line or the delineated riparian habitat, whichever is the greatest, or within 500 m radius from the boundary of any wetland unless authorised by this licence.
- 1.4 The conditions of the authorisation must be brought to the attention of all persons (employees, sub-consultants, contractors etc.) associated with the undertaking of these activities and the Licensee must take such measures that are necessary to bind such persons to the conditions of this licence.
- 1.5 If the Licensee is not the end user/beneficiary of the water use related infrastructure and will not be responsible for long term maintenance and management of the infrastructure, the Licensee must provide a programme for hand over to the successor-in-title including a brief management /maintenance plan and the agreement for infrastructure along with allocation of responsibilities, within three (3) months of the date of issuance of this licence.
- 1.6 A copy of the water use licence and reports set out under condition 1.2 must be on site at all times.
- 1.7 A suitably qualified person(s), appointed by the Licensee, and approved in writing by the Provincial Head, must be responsible for ensuring that the activities are undertaken in compliance with the specifications as set out in reports submitted to the Department and the conditions of this licence.

2. FURTHER STUDIES AND INFORMATION REQUIREMENTS

- 2.1 The current ecological status should not change as the result of the authorised activity and the pipeline crossing the watercourse should not have any joining parts

- 2.2 A rehabilitation, mitigation and maintenance plan including its associated method statement should be submitted for approval prior commencement to the Provincial Head.
- 2.2 The Licensee shall submit in writing under reference 27/2/1/K330/113/6 a complete set of construction drawings of the river crossing for approval prior construction
- 2.3 The Licensee shall within 30 days after completion of the activities inform the Provincial Head in writing and this shall be accompanied by a signature of approval of the registered professional engineer that the construction was done according to the construction drawings.
- 2.4 The Licensee shall submit an operation and maintenance manual with special reference to:
- i. The operation of the scour valves in order to prevent pollution to the Schaapkop River and its tributaries.
 - ii. The management of culverts to be kept clean in order to prevent debris build up and blockages.

3. PROTECTIVE MEASURES

3.1 Storm Water Management

- 3.1.1. Storm water management practices must be constructed, operated and maintained in a sustainable manner throughout the project and for the water use activities set out in condition 1.1 and must include but are not limited to the following:
- 3.1.1.1 Increased runoff due to vegetation clearance and/or soil compaction must be managed, and steps must be taken to ensure that storm water does not lead to bank instability and excessive levels of silt entering the watercourse(s);
 - 3.1.1.2. The velocity of storm water discharges must be attenuated and the banks of the watercourses protected; and
 - 3.1.1.3. Sheet runoff from paved surfaces and access roads need to be curtailed.

3.2 Structures, Construction Plant and Materials

- 3.2.1. The necessary erosion prevention measures must be employed to ensure the sustainability of all structures.
- 3.2.2. The height, width and length of structures must be limited to the minimum dimension necessary to accomplish the intended function.
- 3.2.3. Structures must not be damaged by floods exceeding the magnitude of floods occurring on average once in every 100 years.
- 3.2.4. Structures must be non-erosive, structurally stable and must not induce any flooding or safety hazard.
- 3.2.5. Structures must be inspected regularly for accumulation of debris, blockage, erosion of abutments and overflow areas - debris must be removed and damages must be repaired and reinforced immediately.

- 3.2.6. The construction camp, plant and material stockpiles must be located outside the extent of the watercourse(s) and must be recovered and removed one (1) month after construction has been completed
- 3.2.7. During construction erosion berms should be installed to prevent gully formation, according to the slope.
- 3.2.8. All areas affected by construction should be rehabilitated upon completion of the construction phase of the development. Areas should be reseeded with indigenous vegetation species as required, and the use of seednets is recommended to prevent erosion.
- 3.2.9. During the construction phase no vehicles shall be allowed to indiscriminately drive through any wetland areas.
- 3.2.10. No construction is allowed within the 1:100 year flood line and/or delineated riparian habitat, whichever is the greatest, or within 500 m radius from the boundary of any wetland unless authorised in this license.
- 3.2.11 The length of solid pipe (no joints) across the riparian area and/or 1:100 year flood line (whichever is the greatest) to avoid spillages into the watercourse.
- 3.2.12 The pipe will be elevated over the riparian area and/or 1:100 year flood line (whichever is the greatest) in relation to the other sections of the adjoining pipeline to facilitate no return flow to the watercourse in the event of a spill.
- 3.2.13 The pipe has to be raised over the riparian area and/or 1:100 year flood line (whichever is the greatest) above the maximum flood level to avoid obstruction and damage.
- 3.2.14 No structures to be placed within the 1:100 year flood line and/or the delineated riparian areas unless authorised in this license.
- 3.2.15 The structure of sewer pipeline crossing the watercourse(s) must be non-erosive, structurally stable and may not induce any flooding. Accumulation of debris, blockage, erosion of abutments and overflow must be inspected regularly and damaged areas must be repaired immediately.
- 3.2.16 Once the installation of the pipe has been completed, all construction material e.g. excess plastic will be removed, and the banks of the stream in the position of the bridge will be stabilized and rehabilitated.
- 3.2.17 The manholes or pump stations for the pipeline should be placed at least 30 m away from the river to ensure that no spillages occur into the river should there be a problem with the pipeline.
- 3.2.18 Where the pipeline is closest to the river (that is approximately 10m from the river), the manholes should be sealed as far as possible to minimize spills from these manholes that may occur as a result of pipeline blockages.
- 3.2.19 All manholes within the 1:100 year flood line or delineated riparian habitat, whichever is the greatest, must be encapsulated in concrete to hold a pre-determined capacity to avoid spillage into the river.

- 3.2.20 The proposed pipeline must be constructed in such a way so as to allow any spills from the pipeline to be quickly observed and repaired.
- 3.2.21 The pipeline should be regularly monitored and maintained to ensure that any problems with the pipeline are rectified before it can impact on the Schaapkop river and its tributaries.

3.3 Water Quality

- 3.3.1 The Licensee shall sample the water quality weekly (during construction) and monthly (operation) for the mentioned variables (Table 2) at monitoring points both upstream and downstream of the activities and report to the Provincial Head within thirty (30) days after the results of each sampling event is received:

Table 3: Water quality parameters relevant for sampling.

Variable	Limit
Flow (l/s)	Not applicable
Temperature (°C)	<10% variation
pH	8.0 – 8.5
Electrical conductivity (EC) (mS/m)	<60
Suspended solids (SS) (mg/l)	<25
Dissolved oxygen (mg/l)	>6
Turbidity (NTU)	<3
Secchi disk depth (m)	>1 meter
Alkalinity (mg CaCO ₃ /l)	<100
PO ₄ (mg/l)	<0.5
NO ₂ /NO ₃ (as N) (mg/l)	<6
BTEX, TPH (mg/l)	<1
Faecal coliforms (counts/100ml)	<130

The variables may be amended on discretion of the Responsible Authority. Only an accredited (SANS 17025) laboratory to be used for analysis.

- 3.3.2 Monitoring must continue for three (3) years after the cessation of the activities listed in condition 1.1.
- 3.3.3 Monitoring must be undertaken as set out in section 5.
- 3.3.4 Activities that lead to elevated levels of turbidity of any watercourse(s) must be prevented, reduced, or otherwise remediated. Activities must be scheduled to take place during the dry seasons when flows are lowest where reasonably possible. If this is not possible and if management measures have not been provided for in the reports submitted to the Provincial Head, the Licensee must submit such to the Provincial Head for written approval before these activities commence. Natural in stream hydrology is to be used to determine which months constitute the low flow months.
- 3.3.5 The Licensee must ensure that the quality of the water to downstream water users does not decrease because of the of the water use activities listed under condition 1.1.
- 3.3.6 A qualified person must be appointed to assess the quality of water both upstream and downstream of the activities prior to commencement of construction.

- 3.3.7 Pollution of and disposal/spillage of any material into the watercourse must be prevented, reduced, or otherwise remediated through proper operation, maintenance and effective protective measures.
- 3.3.8 Vehicles and other machinery must be serviced well above the 1:100 year flood line or delineated riparian habitat, whichever is the greatest. Oils and other potential pollutants must be disposed off at an appropriate licensed site, with the necessary agreement from the owner of such a site.
- 3.3.9 Any hazardous substances must be handled according to the relevant legislation relating to transport, storage and use of the substance.
- 3.3.10 All reagent storage tanks and reaction units must be supplied with a bunded area built to the capacity of the facility and provided with sumps and pumps return the spilled material back into the system. The system must be maintained in a state of good repair and standby pumps must be provided.

3.4 Flow

- 3.4.1 The Licensee must determine flood lines (1:50 and 1:100 year) prior to construction to ensure risks are adequately managed. Flood lines must be clearly indicated on the site plan(s).
- 3.4.2 The activities must be conducted in a manner that does not negatively affect catchment yield, hydrology and hydraulics. The Licensee must ensure that the overall magnitude and frequency of flow in the watercourse(s) does not decrease, other than for natural evaporative losses and authorised attenuation volumes.
- 3.4.3 Appropriate design and mitigation measures must be developed to minimise impacts on the natural flow regime of the watercourse i.e. through placement of structures/supports and to minimise turbulent flow in the watercourse.
- ✓ 3.4.4 Structures to be designed in a way to prevent the damming of stream/river water and not impact on the flow of the water, during the construction and operational phases of all developments.
- 3.4.5 The development may not impede natural drainage lines.
- 3.4.6 The diversion structures may not restrict river flows by reducing the overall river width or obstructing river flow.

3.5 Riparian and In-stream Habitat (Vegetation and Morphology)

- ✓ 3.5.1 Activities (including spill clean-up) must start up-stream and proceed into a down-stream direction, so that the recovery processes can start immediately, without further disturbance from upstream works.
- ✓ 3.5.2 Operation and storage of equipment must not take place within the 1:100 year flood line or delineated riparian habitat, whichever is the greatest unless authorised in this license.
- ✓ 3.5.3 Activities must not occur in sensitive riffle habitats.

- ✓ 3.5.4 Indigenous riparian vegetation, including dead trees, outside the limits of disturbance indicated in the site plans must not be removed from the area.
- ✓ 3.5.5 Alien and invader vegetation must not be allowed to further colonise the area, and all new alien vegetation recruitment must be sustainably eradicated or controlled.
- ✓ 3.5.6 Existing vegetation composition must be maintained or improved by maintaining the natural variability in flow fluctuations. Rehabilitated areas shall have a vegetation basal cover of at least 15% at all times.
- ✓ 3.5.7 Recruitment and maintaining of a range of size classes of dominant riparian species in perennial channels must be stimulated.
- ✓ 3.5.8 Encroachment of additional exotic species and terrestrial species in riparian zones must be discouraged.
- ✓ 3.5.9 Accumulation of woody debris on terraces by periodic flooding must be discouraged.
- ✓ 3.5.10 Existing flood terraces and deposition of sediments on these terraces to ensure optimum growth, spread and recruitment of these species must be maintained.
- ✓ 3.5.11 All reasonable steps must be taken to minimise noise and mechanical vibrations in the vicinity of the watercourses.
- ✓ 3.5.12 The necessary erosion prevention mechanisms must be employed to ensure the sustainability of all structures and activities and to prevent in-stream sedimentation.
- ✓ 3.5.13 Soils that have become compacted through the water use activities must be loosened to an appropriate depth to allow seed germination.
- 3.5.14 Slope/bank stabilisation measures must be implemented with a 1:3 ratio or flatter and vegetated with indigenous vegetation immediately after the shaping.
- 3.5.15 Stockpiling of removed soil and sand must be stored outside of the 1:100 flood line or delineated riparian habitat, whichever is the greater, to prevent being washed into the river and must be covered to prevent wind and rain erosion.
- 3.5.16 The indiscriminate use of machinery within the instream and riparian habitat will lead to compaction of soils and vegetation and must therefore be strictly controlled.
- 3.5.17 The overall macro-channel structures and mosaic of cobbles and gravels must be maintained by ensuring a balance (equilibrium) between sediment deposition and sediment conveyance maintained. A natural flooding and sedimentation regime must thus be ensured as far as reasonably possible.
- 3.5.18 As much indigenous vegetation growth as possible should be promoted within the proposed development area in order to protect soil and to reduce the percentage of the surface area which is paved.
- 3.5.19 Run-off from paved surfaces should be slowed down by the strategic placement of berms.

3.6 Biota

- 3.6.1 The Licensee must take all reasonable steps to allow movement of aquatic species, including migratory species.
- 3.6.2 All reasonable steps must be taken not to disturb the breeding, nesting and/or feeding habitats and natural movement patterns of aquatic biota.
- 3.6.3 The current level of diversity of biotopes and communities of animals, plants and microorganisms must be maintained.

4 REHABILITATION AND MANAGEMENT

- 4.1 The Licensee must embark on a systematic long-term rehabilitation programme to restore the watercourse(s) to environmentally acceptable and sustainable conditions after completion of the activities, which must include, but not be limited to the rehabilitation of disturbed and degraded riparian areas to restore and upgrade the riparian habitat integrity to sustain a bio-diverse riparian ecosystem.
- 4.2 All disturbed areas must be re-vegetated with an indigenous seed mix in consultation with an indigenous plant expert, ensuring that during rehabilitation only indigenous shrubs, trees and grasses are used in restoring the biodiversity.
- 4.3 An active campaign for controlling invasive species must be implemented within disturbed zones to ensure that it does not become a conduit for the propagation and spread of invasive exotic plants.
- 4.4 Rehabilitation must be concurrent with construction.
- 4.5 Topsoil must be stripped and redistributed.
- 4.6 Compacted and disturbed areas must be shaped to natural forms and to follow the original contour. In general cut and fill slopes and other disturbed areas must not exceed 1:3 (v:h) ratio. It must be protected, vegetated, ripped and scarified parallel with the contour.
- 4.7 The Provincial Head must sign a release form indicating that rehabilitation was done satisfactory according to specifications as per this license.
- 4.8 A photographic record must be kept as follows and submitted with reports as set out in section 5:
 - 4.8.1 Dated photographs of all the sites to be impacted before construction commences;
 - 4.8.2 Dated photographs of all the sites during construction on a monthly basis; and
 - 4.8.3 Dated photographs of all the sites after completion of construction, seasonally.
- 4.9 Rehabilitation structures must be inspected regularly for the accumulation of debris, blockages instabilities and erosion with concomitant remedial and maintenance actions.

5 MONITORING AND REPORTING

- 5.1 The Provincial Head must be notified in writing one week prior to commencement of the licensed activity and again upon completion of the activity.
- 5.2 A comprehensive and appropriate environmental assessment and monitoring programme (including bio-monitoring) to determine the impact, change, deterioration and improvement of the aquatic system associated with the activities listed under condition 1.1 as well as compliance to these water use licence conditions must be developed and submitted to the Provincial Head for written approval before commencement and must subsequently be implemented as directed.
- 5.3 Six (6) monthly monitoring reports must be submitted to the Provincial Head until otherwise agreed in writing with the Provincial Head: Western Cape Region.
- 5.4 A qualified and responsible scientist must be retained by the Licensee who must give effect to the various licence conditions and to ensure compliance thereof pertaining to all activities impeding and/or diverting flow of watercourses as well as alterations to watercourses on the properties as set out in condition 1.1.
- 5.5 The audit reports must include but are not limited to:
- 5.5.1 Reporting in respect of the monitoring programme referred to in condition <5.2>;
 - 5.5.2 A record of implementation of all mitigation measures including a record of corrective actions; and
 - 5.5.3 Compensation measures for damage where mitigation measures have failed to adequately protect the in-stream and riparian habitat or any other characteristic of the watercourses.
- 5.6 The Licensee must apply in writing to the Provincial Head for alternative reporting arrangements for which written approval must be provided.
- 5.7 Monitoring must continue throughout the operation of the sewer pipeline and for the activities listed in condition 1.1.

6 OTHER WATER USERS

- 6.1 The Licensee must attempt to prevent adverse effect on other water users. All complaints must be investigated by a suitable qualified person and if investigations prove that the Licensee has impaired the rights of other water users, the Licensee must initiate suitable compensative measures.

7. POLLUTION PREVENTION, INCIDENTS AND MALFUNCTIONS

- 7.1 Pollution incidents shall be dealt with in accordance with Section 19 and 20 of the Act
- 7.2 Any incident that may cause pollution of any water resource shall immediately be reported to the Responsible Authority

- 7.3 If surface and/or groundwater pollution has occurred or may possibly occur, the Licensee must conduct, and/or appoint specialists to conduct the necessary investigations and implement additional monitoring, pollution prevention and remediation measures to the satisfaction of the Responsible Authority.
- 7.4 The Licensee shall keep all records relating to the compliance or non-compliance with the conditions of this licence in good order. Such records shall be made available to the Provincial Head within 14 (fourteen) days of receipt of a written request by the Department for such records.
- 7.5 The Licensee shall keep an incident report and complaints register, which must be made available to any external auditors and the Department.

8 BUDGETARY PROVISIONS

- 8.1 The water user must ensure that there is a budget sufficient to complete and maintain the water use and for successful implementation of the rehabilitation programme as set out in this licence.
- 8.2 The Department may at any stage of the process request proof of budgetary provisions for rehabilitation and closure of project.

[END OF LICENCE]



REFERENCE: 16/3/1/1/D2/50/0060/12
ENQUIRIES: Shireen Pullen
DATE OF ISSUE: **17 November 2021**

The Municipal Manager
George Municipality
Private Bag 19
GEORGE
6530

Attention: Ms. L. Mooiman

Tel: (044) 801 9111
Email: lc mooiman@george.gov.za

Dear Madam

ACCEPTANCE OF THE UPDATED ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THEMBALETHU BULK SERVICES, GEORGE

1. The above-mentioned document received by the Directorate: Development Management (Region 3) hereinafter referred to a "this Directorate" on 18 October 2021 refers.
2. Based on the review of the content of the updated EMPr and by virtue of the powers conferred on it by the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended), the competent authority herewith approves the amended EMPr.
3. In addition to the above, please be reminded that the EMPr is a working document and can be amended at times to address certain changes (if any) that may be required, provided that the outcomes of the EMPr are still the same and remains relevant.
4. Currently, the EMPr contains an updated Site Development Plan (SDP) and not the SDP referred to in the Environmental Authorisation (EA). In the new updated plan, the pipeline follows the contours slightly up the stream valley, instead of straight across, as indicated on the approved SDP. This section of pipeline was re-aligned to the top of the valley slope to avoid traversing the remaining Afrotropical Forest patches located within this section of the Schaapkop River Valley. It is hereby confirmed that no application for amendment is required as this slight change in the routing is considered to still be approximate to the site development plan approved as part of the development.
5. A compliance monitoring inspection will be undertaken after commencement of construction activities, in order to determine compliance with the Environmental Authorisation issued on 6 April 2021.

6. Your attention is further drawn to the audit requirements of the aforementioned Environmental Authorisation. Please note that in light of the recent official feedback received from the Chief Director: Development Planning regarding environmental audits, neither the Environmental Assessment Practitioner (EAP) or the Environmental Control Officer (ECO) can undertake an audit nor a person from the same company as the EAP or ECO, as it would represent a circumstance that may compromise the objectivity of the audit. Therefore, all audits to be conducted must be done by an independent auditor (not the EAP/ECO).
7. Please note that it is an offence in terms of Section 49A of the NEMA to fail to comply with the provisions of an Environmental authorisation. Failure to comply with the requirements of Section 24F of the NEMA shall result in the matter being referred to the Environmental Compliance and Enforcement Directorate of this Department. A person convicted of an offence in terms of the above is liable to a fine not exceeding R10 million or to imprisonment for a period not exceeding 10 years, or to both such fine and imprisonment.
8. Kindly quote the abovementioned reference number in any future correspondence in respect of the abovementioned development.
9. This Department reserves the right to revise initial comments and request further information from you based on any new or revised information received.

Yours faithfully

Malcolm
Fredericks

pp _____

Digitally signed by Malcolm
Fredericks
Date: 2021.11.16 16:07:01
+02'00'

HEAD OF COMPONENT: ENVIRONMENTAL: IMPACT MANAGEMENT SERVICES
DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING

Copies to:

Ms Siân Holder
Mr. A. Molendorf

Cape EAPrac
George Municipality

Email: sian@cape-eaprac.co.za
Email: avmolendorff@george.gov.za

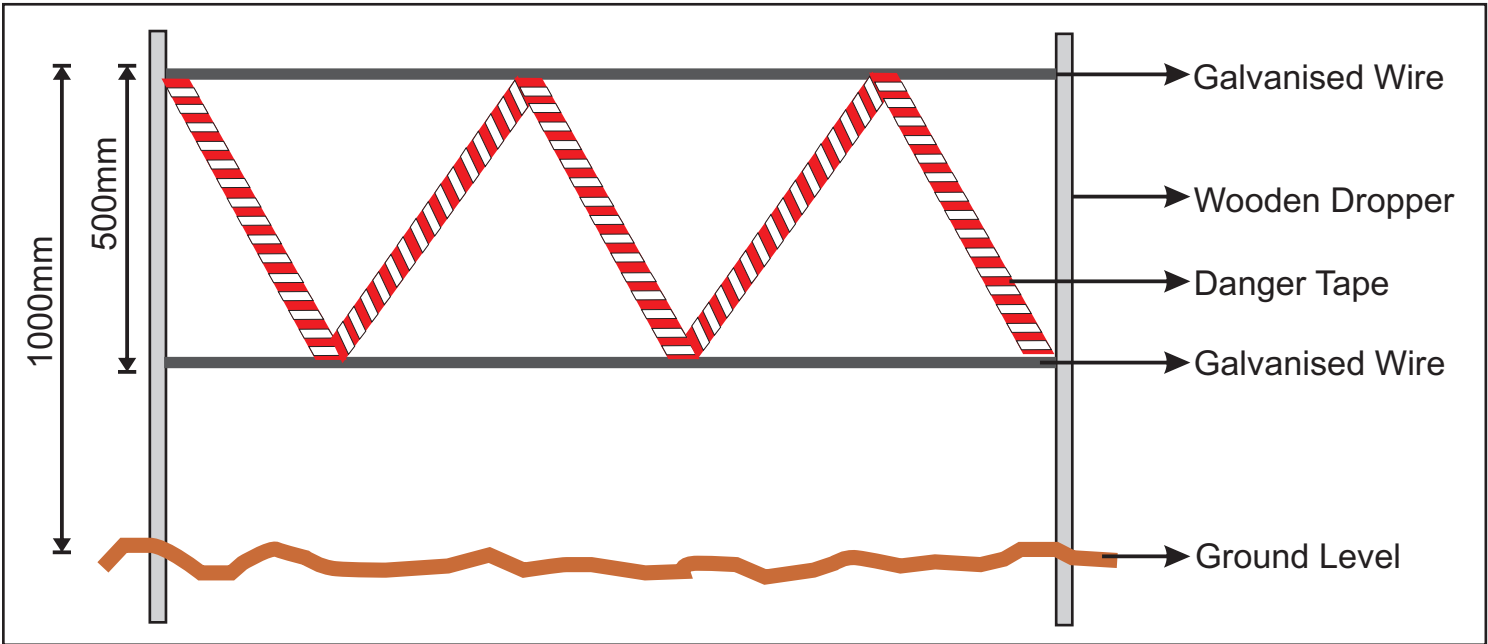


Plate A: Showing a cross section of a typical method of demarcation of no-go areas.

Where demarcation is required on a down slope, it can be more cost effective to include the required silt protection mechanisms on the same support structure as the demarcation. This is detailed in **Plate B** below and must be read in conjunction with the details on erosion control included in the previous diagram.

GENERAL CONSIDERATIONS FOR DEMARCATION OF NO GOAREAS

- The demarcation must include all areas that are going to be disturbed in the total construction (including all service lines)
- The no -go areas may not be accessed by any person (including lunch, tea breaks etc.). Without the explicit written permission from te ECO.
- Maximum fines will be issued for any non compliance with regards to the no go policy.

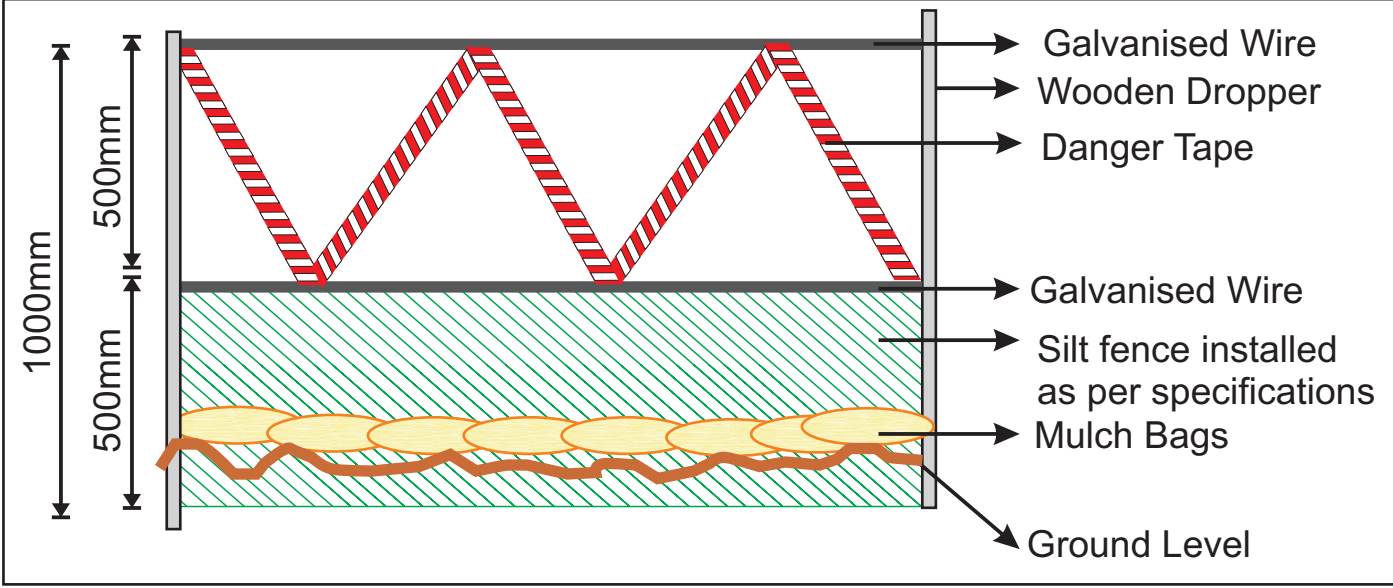
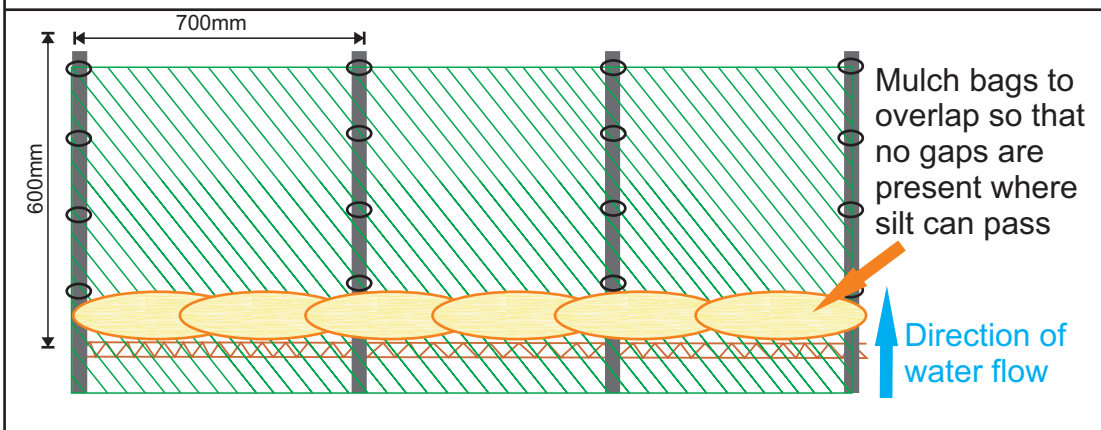


Figure 1: Demarcation of No - Go Areas During Construction



Cape Environmental Assessment Practitioners (Pty) Ltd

Frontal View



The purpose of a silt fence is to create a temporary barrier to maintain sediment on a construction site in order to prevent soil erosion and pollution through sediment and nutrient loading. Silt fences are designed to detain sediment from the disturbed construction area and also prevent sheet erosion by decreasing the velocity of the run off.

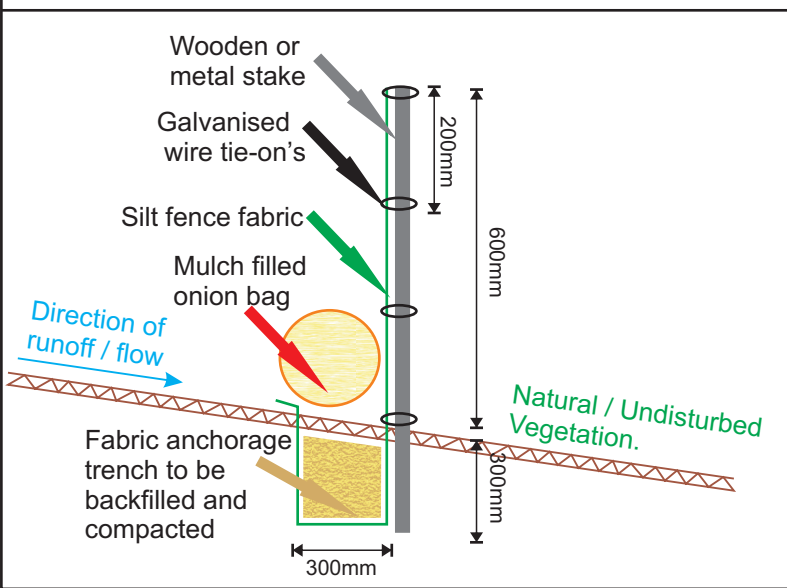
Technical Specifications

- Silt fence fabric to consist out of 50% shade cloth or a geotextile such as biddim (if biddim is used, it is not necessary to place mulch bags).
- Wooden droppers are suitable for the stakes. If the construction program takes place over an extended time frame it may be necessary to use treated droppers or metal stakes.
- The support stakes should not be placed further than 700mm apart on the down slope side of the fabric.
- The fabric should be secured to the stakes using galvanised wire ties not further than 200mm apart.
- The fabric anchorage trench should be at least 300mm deep.

Planning, Placing and Maintenance

- The silt fence is to be installed on all disturbed slopes where sheet erosion may take place.
- This type of silt fence is not suitable for areas where water is concentrated. i.e. gulleys and storm-water outlets.
- The silt fences should be along the contour lines
- The rows of silt fences should be bowed to prevent erosion and loss of silt on the ends of the fence line.
- Silt fences should be inspected weekly and before every forecast rainfall event. Any damage must be repaired immediately.
- Silt deposits should be cleared after each rainfall event. **CLEARED SILT MUST NOT BE PLACED DOWN SLOPE OF THE FENCE.**

Cross-section View



Top View

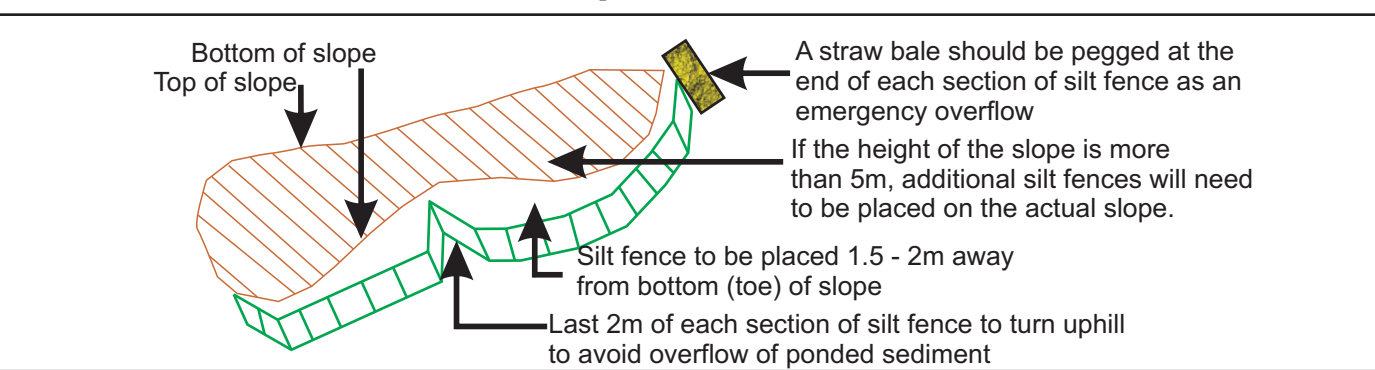
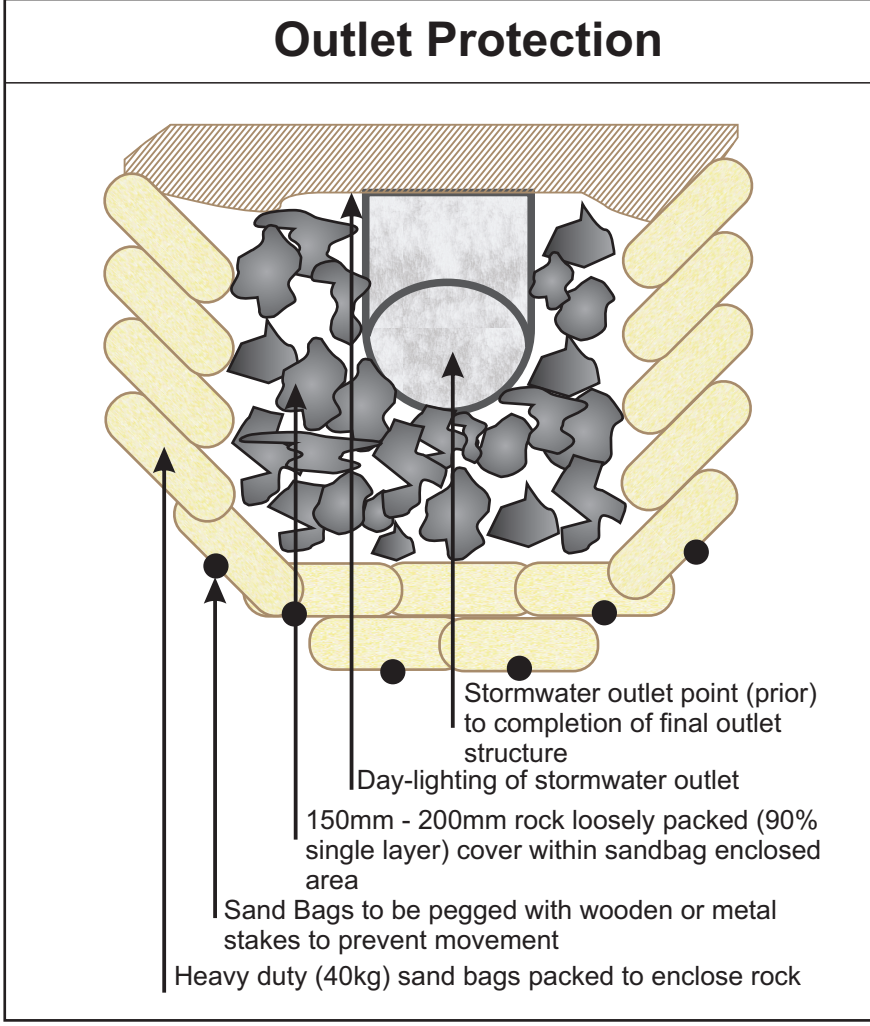
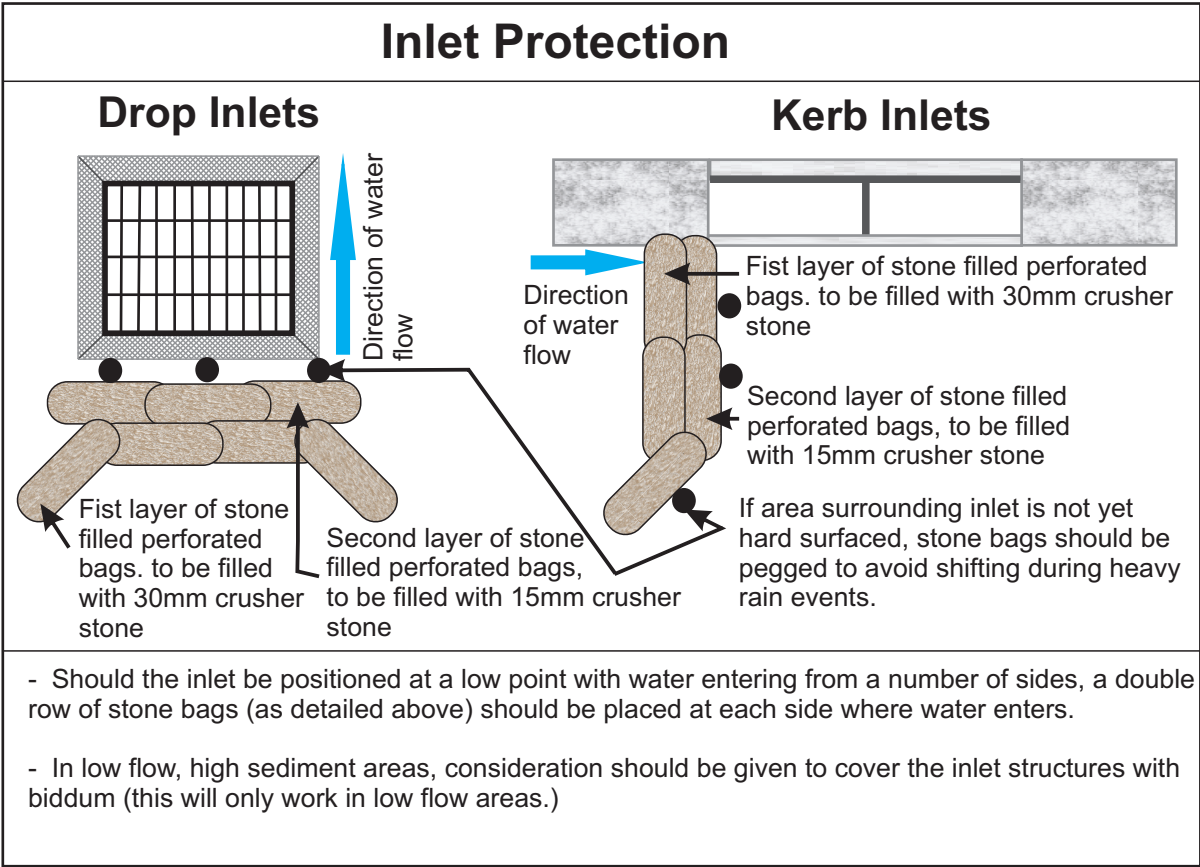




Figure 2: Specifications for Silt Fences





- The methodology referred to above is effective as a temporary measure to be used during construction and is in no way intended to replace the permanent measures that must be installed. These permanent measures must be constructed as per the engineers specifications.
- Stormwater systems should ideally be constructed during low rainfall periods in order to allow for permanent protection measures to be put in place before the rainy season.
- Consideration should be given to encase the outlet structure with a geo-fabric such as biddum. This should first be clarified with the site engineer to ensure compatibility with the stormwater system.

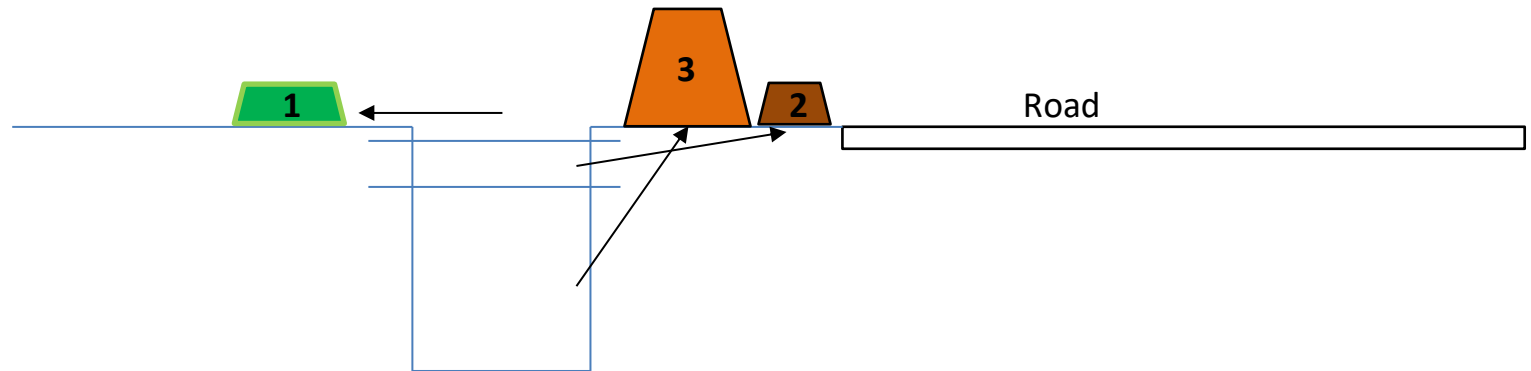
Figure 3: Specifications for Temporary Stormwater Management During Construction

	ENVIRONMENTAL DO'S	ENVIRONMENTAL DON'TS
Work Site	 <p>Workers and equipment to stay within site boundaries</p>	 <p>Do not enter no go areas</p>
Materials & Equipment	 <p>Use drip trays Report spills</p>	 <p>Do not create dust Do not drive too fast</p>
	 <p>Store in camp at night Check for leaks Ensure loads don't spill</p>	 <p>Do not wash machinery or tools on site</p>
Waste Management	 <p>Use toilets provided</p>	 <p>Don't burn or bury waste No fires on site Report any other fires</p>
	 <p>Use bins provided for cigarette butts & waste</p>	 <p>Eat in designated area Don't eat at dam or river</p>
Natural Environment	 <p>Save water Use only drinking water provided</p>	 <p>Do not damage trees, flowers or rocks</p>
	 <p>Protect animals and archaeological remains</p>	 <p>Do not swim or wash in the dam or river</p>
Danger & Emergencies	 <p>Know emergency procedures & no's Report accidents</p>	 <p>No smoking near gas or diesel</p>
	 <p>Be careful when working with hazardous substances</p>	 <p>Fines will be issued for non-compliance with environmental specifications</p>

Environmental Guidelines for Trenching

Excavation Methodology:

1. Remove top vegetation layer with as much of the root systems as possible – place on furthest side of trench from road.
2. Remove $\pm 200\text{mm}$ layer of topsoil – place / stockpile closest to road.
3. Remove remainder of subsoil to required trench depth – place / stockpile next to trench.



Backfill Methodology:

Once Cable Sleeve has been installed, backfill trench as follows:

- Reverse order:
3. Backfill with subsoil closest to trench – compact as required.
 2. Backfill top of trench with topsoil – do not compact.
 1. Cover topsoil with vegetation layer back to natural ground level.

COMMON SNAKES OF THE SOUTHERN CAPE

Garden Route & Klein Karoo



VERY DANGEROUS

Has caused human fatalities

DANGEROUS

Painful bite, but does not require antivenom

MILDLY VENOMOUS

Not thought to be harmful

HARMLESS

Not dangerous to humans



VERY DANGEROUS

Cape Cobra
(*Naja nivea*)



VERY DANGEROUS

Cape Cobra - juvenile
(*Naja nivea*)



VERY DANGEROUS

Cape Boomslang - male
(*Dispholidus typus typus*)



VERY DANGEROUS

Cape Boomslang - female
(*Dispholidus typus typus*)



VERY DANGEROUS

Puff Adder
(*Bitis arietans arietans*)



DANGEROUS

Berg Adder
(*Bitis atropos*)



VERY DANGEROUS

Rinkhals - banded phase
(*Hemachatus haemachatus*)



DANGEROUS

Coral Shield Cobra
(*Aspidelaps lubricus lubricus*) Photo David Maguire



MILDLY VENOMOUS

Karoo Sand Snake
(*Psammophis notostictus*)



MILDLY VENOMOUS

Herald or Red-lipped Snake
(*Crotaphopeltis hotamboeia*)



MILDLY VENOMOUS

Spotted Harlequin Snake
(*Homoroselaps lacteus*)



DANGEROUS

Rhombic Night Adder
(*Causus rhombeatus*)



CAN INFLICT A NASTY BITE

Mole Snake
(*Pseudaspis cana*)



HARMLESS

Rhombic Egg-eater
(*Dasypeltis scabra*)



HARMLESS

Western Natal Green Snake Photo Tyrone Ping
(*Philothamnus natalensis occidentalis*)



HARMLESS

Olive Snake
(*Lycodonomorphus inornatus*)



HARMLESS

Brown House Snake
(*Boaedon capensis*)



HARMLESS

Common Brown Water Snake
(*Lycodonomorphus rufulus*) Photo Tyrone Ping



HARMLESS

Delalande's Beaked Blind Snake
(*Rhinotyphlops lalandei*)



HARMLESS

Common Slug-eater
(*Duberria lutrix lutrix*) Photo Tyrone Ping

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JOHAN MARAIS is the author of various books on reptiles including the best-seller *A Complete Guide to Snakes of Southern Africa*. He is a popular public speaker and offers a variety of courses including **Snake Awareness**, **Scorpion Awareness** and **Venomous Snake Handling**. Johan is accredited by the International Society of Zoological Sciences (ISZS) and is a Field Guides Association of Southern Africa (FGASA) and Travel Doctor-approved service provider. His courses are also accredited by the Health Professions Council of South Africa (HPCSA).

ALGEMENE SLANGE VAN DIE SUIDELIKE KAAP

Tuinroete & Klein Karoo



BAIE GEVAARLIK

Is verantwoordelik vir menslike sterftes

GEVAARLIK

Pynlike byt, maar teengif nie noodsaaklik

MATIG GIFTIG

Word nie as skadelik beskou

ONSKADELIK

Hou geen gevaar in vir mense



BAIE GEVAARLIK

Kaapse Kobra (*Naja nivea*)



BAIE GEVAARLIK

Kaapse Kobra - onvolwasse (*Naja nivea*)



BAIE GEVAARLIK

Kaapse Boomslang - mannetjie (*Dispholidus typus typus*)



BAIE GEVAARLIK

Kaapse Boomslang - wyfie (*Dispholidus typus typus*)



BAIE GEVAARLIK

Pofadder (*Bitis arietans arietans*)



GEVAARLIK

Bergadder (*Bitis atropos*)



BAIE GEVAARLIK

Rinkhals - met bande (*Hemachatus haemachatus*)



GEVAARLIK

Koraalkobra (*Aspidelaps lubricus lubricus*) Foto David Maguire



MATIG GIFTIG

Karoo-sandslang (*Psammophis notostictus*)



MATIG GIFTIG

Rooilipslang of Heraldslang (*Crotaphopeltis hotamboeia*)



MATIG GIFTIG

Gevlekte kousbandjie (*Homoroselaps lacteus*)



GEVAARLIK

Nagadder (*Causus rhombeatus*)



KAN 'N SLEGTE BYT TOEDIEN

Molslang (*Pseudaspis cana*)



ONSKADELIK

Gewone eivrevter (*Dasypeltis scabra*)



ONSKADELIK

Westelike Natal groenslang Foto Tyrone Ping (*Philothamnus natalensis occidentalis*)



ONSKADELIK

Olyfslang (*Lycodonomorphus inornatus*)



ONSKADELIK

Bruinhuislang (*Boaedon capensis*)



ONSKADELIK

Bruinwaterslang (*Lycodonomorphus rufulus*) Foto Tyrone Ping



ONSKADELIK

Delalande se haakneusblindeslang (*Rhinotyphlops lalandei*)



ONSKADELIK

Gewone slakvrevter (*Duberria lutrix lutrix*) Foto Tyrone Ping

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JOHAN MARAIS is the author of various books on reptiles including the best-seller *A Complete Guide to Snakes of Southern Africa*. He is a popular public speaker and offers a variety of courses including **Snake Awareness, Scorpion Awareness and Venomous Snake Handling**. Johan is accredited by the International Society of Zoological Sciences (ISZS) and is a Field Guides Association of Southern Africa (FGASA) and Travel Doctor-approved service provider. His courses are also accredited by the Health Professions Council of South Africa (HPCSA).



Cape EAPrac Company Profile

Cape Environmental Assessment Practitioners (Pty) Ltd was established in March 2008 by Directors **Doug Jeffery** (EAPASA Reg. No 2019/1746) and **Louise-Mari van Zyl** (EAPASA Reg. No. 2019/1444). The full time professional team includes: **Dale Holder** - Senior Environmental Practitioner (EAPASA Reg.No 2019/301), **Siân Holder** (Practitioner/ECO/Environmental Education), **Mariska Byleveld** - Candidate Environmental Practitioner (EAPASA Reg. No 2023/6593), **Francois Byleveld** - Candidate Environmental Practitioner (EAPASA Reg.No 2023/6700), **Onke Nandipha** (EAPASA Reg.No 2023/6688) & **Charmaine Mudau** - Full Time On-Site ECOs and **Carin Naudé** - Business Administrator.

The firm implements legislation under the National Environmental Management Act (NEMA), National Environmental Management: Waste Act (NEM:WA) and the National Environmental Management: Air Quality Act (NEM:AQA).

Our main services include:

- Environmental Impact Assessments (EIA's & Basic Assessments)
- Environmental Management Policies & Plans (EMMP's)
- Environmental Control & Monitoring(ECO)
- Environmental Audits
- Environmental Education & Interpretation
- Environmental Constraints Analysis
- Public Participation & Stakeholder Engagement
- Outeniqua Sensitive Coastal Area Permits (OSCA)
- Forestry Applications (for removal/pruning of protected species)
- GIS & Mapping
- Retrospective Damage Assessment (Section 24G)
- Rehabilitation Plans
- Coastal Water Discharge Permits
- Air Quality Licence Applications (AEL's)
- Waste Management Licence Applications (Waste Licence)

PROJECT EXPERIENCE INCLUDES

Reverse Osmosis Desalination; Sensitive Environmental Management including National Parks/Conservation Areas & World Heritage Sites; Renewable Energy Projects (Solar & Wind); Waste Management License Applications for Waste Disposal Sites, Sewerage Plants & Abattoirs; Waste-to -Energy Projects including Biogas Facilities; Marine Aquaculture; Filling Stations; Air Emission Processes for Sawmills, Brick Works & Processing Plants; ECO responsibilities on Private & State Housing Developments, Provincial & Municipal Roads and Infrastructure, Private, Provincial & Municipal applications for development of infrastructure, housing & commercial components

LIST OF ONGOING **CAPE EAPRAC**
PROJECTS IS AVAILABLE
ON REQUEST.
PLEASE VISIT OUR
WEBSITE FOR MORE DETAILS

The Team

Doug Jeffery - Director

Doug Jeffery obtained a Bsc with majors in Botany and Zoology at the University of Cape Town (UCT) and went on to obtain his MSc in Botany also at UCT. He has worked extensively in the Western-, Southern- and Eastern Cape both as a professional Botanist and co-ordinating EIA processes for over 20 years. He is registered with the South African Council for Natural Scientific Professions since 1990. He is also registered with the Environmental Assessment Practitioners Association of South Africa.

email: doug@dougjeff.co.za



Dale Holder

Senior Environmental Practitioner

Dale graduated from the Technicon Pretoria in 1999 with a National Diploma in Nature Conservation. He worked as a Socio-Ecologist for SANParks and as Project Manager for the Department of Marine and Coastal Management. He started working as an environmental practitioner in 2002. His focus is currently on Renewable Energy Infrastructure Assessment, but is also involved with assessments in various other industries.

Registered as a Professional Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA). (Reg. No. 2019/301)

email: dale@cape-eaprac.co.za



Siân Holder - Consultant / ECO

Siân completed a National Diploma Nature Conservation (Pta Tech), B-tech Nature Con. (NMMU) and a Masters Degree in Environmental Education (Rhodes University). She joined our team in 2008. She worked as Environmental Assessment Practitioner for many years, but her current focus is on Environmental Control and Monitoring, Rehabilitation and Alien Invasive Management.

email: sian@cape-eaprac.co.za



Carin Naudé

Business Administrator

Carin obtained a BBA degree through UNISA. She gained extensive experience in business management and administration since 1988. She joined Cape EAPrac in June 2008 and is responsible for the day to day administrative functions of the business. Her acquired knowledge and leadership skills enables the rest of the team to function efficiently in their respective fields.

email: carin@cape-eaprac.co.za



Louise-Mari van Zyl

Director / Principal Environmental Practitioner

Louise-Mari van Zyl holds a Masters degree in Geography & Environmental Sciences from the University of Stellenbosch. She worked as an Environmental Assessment Practitioner (EAP) since 2002 on projects in the Eastern, Southern, Western & Northern Cape provinces. She is registered as an EAP with the Environmental Assessment Practitioners Association of South Africa.

email: louise@cape-eaprac.co.za



Mariska Byleveld

Candidate Environmental Practitioner

Mariska joined Cape EAPrac in April 2022. She completed her BSc in Geology in 2016, BSc Honours in 2017 and holds a MSc in Geology from the University of the Free State (2020). She worked as a Geologist for two years before joining our team. She is registered as a Candidate Environmental Practitioner.

email: mariska@cape-eaprac.co.za



Francois Byleveld

Candidate Environmental Practitioner

Francois graduated from the University of the Free State in 2020 with a MSc in Geology. After working in the petroleum industry, he joined our team in May 2023 to train as an Environmental Assessment Practitioner. He is registered as a Candidate EAP.

email: francois@cape-eaprac.co.za



On-Site ECOs



We have three full-time, on-site ECOs, working on PV Solar construction sites in the Northern Cape:

- ♦ Onke Nandipha - BSc in Environmental Sciences (2017) and a BSc Honours in Geography (2018) from Walter Sisulu University. He is registered as a Candidate EAP with EAPASA.
- ♦ Charmaine Mudau - BA in Geography and Environmental Management from the University of the Free State (2014) and a BSc Honours in Geography from UNISA (2020).

Their knowledge and understanding of environmental management make them a valuable asset on site.

email: onke@cape-eaprac.co.za &
charmaine@cape-eaprac.co.za