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**NOTICE OF MUNICIPAL PLANNING  
TRIBUNAL MEETING  
OF STELLENBOSCH MUNICIPALITY  
FRIDAY, 2020-06-26 FROM 10:00-15:00**

**VOLUME 2**



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THE STELLENBOSCH MUNICIPALITY			
<b>PLANNING REPORT: LAND USE AND LAND DEVELOPMENT APPLICATION:</b>			
<b>APPLICATION FOR REZONING FROM AGRICULTURAL ZONE 1 TO OPEN SPACE ZONE II FOR THE ESTABLISHMENT OF A PUBLIC CEMETERY AND MEMORIAL PARK: REMAINDER FARM NO. 29, STELLENBOSCH DIVISION</b>			
<b>Application Reference number</b>	File Ref: Farm No. 29, Stellenbosch Division (LU/9404)	<b>Application Date</b>	2019/04/02

PART A: APPLICANT DETAILS			
<b>First name(s) &amp; Surname</b>	Jolandie Linnemann		
<b>Company name</b>	CK Rumboll & Partners		
<b>SACPLAN registration number</b>	N/A		
<b>Registered owner(s)</b>	Stellenbosch Municipality	<b>Is the applicant properly authorised to submit the application</b>	Yes

PART B: PROPERTY DETAILS			
<b>Property description</b>	Farm No. 29	<b>Town/ City</b>	Stellenbosch Division
<b>Physical address</b>	Main Road 174 (R304)		
<b>Extent (m<sup>2</sup> /ha)</b>	±40ha	<b>Current zoning</b>	Agriculture Zone I
<b>Existing Development and Current land use</b>	The site is covered with Blue Gum- and Port Jackson trees		
<b>Any unauthorised land use/building work</b>	None		
<b>Title Deed Nr.</b>	T72662/2007 (see ANNEXURE D)		

<b>PART C: APPLICATION DETAILS</b>	
<b>Applications(s)</b>	Application is made in terms of Section 15(2)(a) of the Stellenbosch Municipal Land Use Planning By-Law, promulgated by notice number 354/2015, dated October 2015, for the rezoning of Farm No. 29, Stellenbosch Division from <b>Agricultural Zone I</b> to <b>Open Space Zone II</b> for the establishment of a public cemetery and memorial park.
<b>Purpose of Application</b>	To establish a public cemetery and memorial park. The public cemetery and memorial park aims to promote a more modern concept to that of traditional public cemeteries by including some or all modern trends such as a memorial garden; memorial tree plaque; columbarium; lawn cemetery; headstone graves; natural burial; dedication seat; etc. (see <b>ANNEXURE B</b> for Site Development Plan)
<b>Pre-consultation</b>	No pre-consultation minutes is on file.

#### **PART D: APPLICATION BACKGROUND**

##### **1. Location of property**

The site is located ±10km north-east of Stellenbosch to the east of Main Road 174 (R304) and west of Elsenburg Agricultural College (see **ANNEXURE A** for locality plan).

##### **2. The prevailing development context of the subject surrounding/ neighbouring area**

The subject property is surrounded with agricultural properties and tourist related activities such as Koelenhof Winery, Ernst Gouws & co Wine Tasting, Torres Brewpub, Wild Clover restaurant, Vrede Wines, etc.

##### **3. Historic use and development of the property, incl. existing and any illegal uses.**

The Calcutta site is degraded and heavily invested with alien Port Jackson- and Blue Gum trees that stand out from the surrounding countryside, which tends to be open fields and vineyards.

**4. Overview of any relevant previous planning applications and the outcomes of such applications with copied decisions taken on such applications.**

No previous land use applications have been approved on the subject property.

**5. Overview of application history if applicable (amendment to application, delays and reasons for delay, any applicable administrative condonations i.t.o. prescribed processes or timelines.)**

The provision and maintenance of cemeteries, funeral parlours and crematoria is a function vested in local government in terms of Schedule 5 (Part B) of the Constitutions of the Republic of South Africa, 1996 (Act 108 of 1996).

The Greater Stellenbosch Municipality's burial space in cemeteries is under pressure. The development of suitable cemetery sites to provide capacity in this regard has become critical. The Department Planning & Economic Development subsequently initiated a tender process in terms of which the following call for proposals was issued:

- the establishment of a professional team for the identification of suitable sites for the establishment of one or more regional cemetery sites of 30ha and more with the Stellenbosch Municipality;
- the preparation and submission of applications for authorisation of a municipal cemetery, including all specialist assessments related to the activities;
- The planning and design of all related service infrastructure for the cemetery; and
- The planning and design of the cemetery and establishing a cemetery register in accordance with the layout.

Bidders were requested to evaluate those cemetery sites as per the above Council resolution as well as alternative sites that might be identified as being feasible.

CK Rumboll & Partners were appointed by the Stellenbosch Municipality under tender B/SM No. 17/16 for the Identification and Acquisition of Authorisation and Approvals for the establishment of one or more regional cemeteries for Stellenbosch.

By mid-2017, through a systematic assessment of various criteria, five potential sites for the entire Municipal area were identified as best suited for the proposed development of regional public cemetery and memorial parks. These 5 sites were further evaluated by a team of specialists in terms of the suitability leaving only two suitable sites, Remainder Farm Calcutta No. 29 and Farm Louw's Bos No. 502, Stellenbosch Division.

#### **PART E: APPLICATION OVERVIEW AND MOTIVATION (see ANNEXURE C)**

1. Due to the important role that cemeteries play in a community, it is imperative that cemeteries be located within an acceptable distance to the community it serves.
2. The cemetery establishment aims to cater for the cultural needs with the municipal area.
3. Local cemeteries are fast reaching capacity with only a few graves that are left.
4. The portion of land where the memorial park is proposed (Remainder Farm Calcutta No. 29) is owned by Stellenbosch Municipality.
5. Taking into account the surrounding agricultural area, this proposed area serves to be the best option as it is not utilized for agricultural purposes with the site being infested with Blue Gum- and Port Jackson trees.
6. The concept involves establishing a memorial park set in landscaped environment providing a peaceful, tranquil, dignified and safe environment in which families can put to rest their loved ones, rather than just a cemetery.
7. A memorial park will require landscaping, manicuring and maintaining. Sustainable employment opportunities will be created.
8. A memorial park provides for all income groups, cultures and religions.
9. Memorial parks are also designed to enhance recreation and leisure opportunities like hiking and biking trails.
10. The proposed memorial park will have no impact on people's access to natural resources i.e wood, water and medicinal plants.

11. Sales related to the land will contribute to the economy of the Municipality.
12. The proposed memorial park will provide the much needed burial space required.
13. The memorial park serves as a greener approach to the establishment of traditional burial grounds, whilst promoting an alternate, less land demanding option for burial and remembrance.
14. The proposed cemetery will take the form of a memorial park which would allow significant leeway for walkways and landscaping.
15. No viable agricultural land will be lost.

## PART F: PUBLIC PARTICIPATION, COMMENTS AND RESPONSE (see ANNEXURE E)

### 1. Process followed

The applicant has, in terms of Section 45 of the Stellenbosch Municipality Land Use Planning By-Law, 2015, notified the external departments, advertised in the local newspaper and notified (serving of notices) all interested and affected parties, as well as community organisations and also placed notices on the property. The advertising period was from 12 September 2019 to 12 November 2019.

Methods of advertising				Date published	Closing date for Objections/comments
Press (Eikestad News)	Y	N	N/A	12 September 2019	14 October 2019
Notices	Y	N	N/A	12 September 2019	14 October 2019
Ward councillor	Y	N	N/A	12 September 2019	14 October 2019
On-site display	Y	N	N/A	12 September 2019	14 October 2019
Community organisation(s)	Y	N	N/A	12 September 2019	14 October 2019
State departments	Y	N	N/A	13 September 2019	12 November 2019

The following registered letters came back, unclaimed:

- Astral Operation Limited - Farm No's. 27/6; 727/29; 727/16
- Enza Zaden South Africa (PTY) LTD – Farm No. 27/26
- San Michele Farm (PTY) LTD - Farm No. 66/38
- Duplenia Plase EDMS BPK – Farm No. 27/21

- Banisi Investments (PTY) LTD – Farm No. 1037
- Sundowners by Stellenbosch CC – Farm No. 1049
- V H Holdings BV – Farm No. 66/22
- S Baschiera – Farm No. 1037/1
- Strobe Properties (PTY) LTD – Farm No. 27
- Raoul Fontana Trust – Farm No. 66/25
- Mista Mott Inv PTY LTD – Farm No. 66/17

## 2. Public & stakeholder inputs

A comment was received from one of the interested and affected property owners, Francois Malan from Simonsig Wines. Francois gave a brief overview of the history of the application property which could possibly determine the name of the cemetery (Calcutta or Outspan?). He also enquired about the height of the chapel as it was not clearly indicated in the application. He suggested that the chapel be designed in such a way to integrate with the rural environment and should not be a church tower. Another property owner, Mr Marthinus Saunderson, wanted to know if the input of the Department of Agriculture was obtained and also enquired about the total cost of the cemetery as well as the future maintenance cost. See **ANNEXURE F**.

## 3. Government related inputs received

- a) The **Department of Environmental Affairs and Development Planning** granted Environmental Authorisation and adopted the Freshwater Rehabilitation, Maintenance and Management Plan (see **ANNEXURE G**, letter dated 20 September 2019).
- b) The **Department of Agriculture (Eisenburg)** supported the proposal subject to the following comment and conditions (see **ANNEXURE H**, letter dated 17 January 2020):
  - i) *The area has duplex soil prone to saturated conditions for short to medium periods (possibly 2-3 months) of the year in the subsoil. Subsurface drainage has to be considered to minimise the effect of saturation/high water table. Wetlands are so present and need to be preserved.*
  - ii) *Surface run-off water as well as lateral drainage of water on top of clay layers needs to be mitigated as to prevent contamination, pollution or sedimentation of the drainage line and Plankenburg River.*

- iii) *That the neighbouring farms right to farm and that what is normally associated with that (including boreholes, farm infrastructure and day to day farming activities but not limited to) be protected at all cost and that the cemetery and use thereof not impede in any way possible and that the owners/managers and successors in title agree to that.*
- c) **Heritage Western Cape** supported the proposal (see **ANNEXURE I**).
- d) The **Stellenbosch Heritage Foundation** supported the proposal (see **ANNEXURE J**, letter dated 18 November 2019)
- e) The **Department of Transport and Public Works** supported the proposal subject to certain conditions (see **ANNEXURE K**, letter dated 15 November 2019):
- i) *A review by the applicant's professional team of the most appropriate place for the provision of an access to the subject property, taking into account the feasibility of locating an access directly opposite to serve the property on the west side of Main Road 174 and possible environmental constraints and approval thereof by this Branch.*
- ii) *The installation of a right turn lane on Main road 174 (the R304) northbound and at least a left turn taper southbound, with the road widened sufficiently to retain constant width shoulders.*
- iii) *The widening of the access road as it approaches Main Road 174 to operate as separate left turn and right turn lanes.*
- iv) *The applicant accepting in writing to be responsible for all costs associated with the design and implementation of the required road upgrades.*
- v) *The design of road widening, right turn lane, left turn taper and access road widening shall be carried out by an appropriately registered person in accordance with this Department's design guidelines and requirement. Detail drawings of the road geometry, pavement/materials, drainage, and road signs and markings, shall be submitted to the Design Directorate (Ms MK Hofmeyr, ph. 021 483 5713) of this Branch for approval prior to the commencement of construction.*



- vi) *Detailed construction drawings and proposals for traffic accommodation during construction shall be submitted for approval to the District Roads Engineer, Paarl prior to construction.*
- vii) *The Applicant's consultant or contractor shall accept the handing over of the site in writing form the Road Authority prior to construction.*
- viii) *After completion of the construction phases to the satisfaction of the District Roads Engineer, Paarl the Road Authority shall accept in writing the handing over of the site from the Applicant's consultant or contractor.*
- ix) *As built drawings shall be sent to this Branch (Ms GD Swanepoel) the District Roads Engineer, Paarl, (021 863 2020) and the Roads Department of Cape Winelands District Municipality (Mr ACA Stevens – 086 126 5263)*

#### **4. Comments from internal service departments**

- a) The **Manager: Community Development** supported the proposal (see **ANNEXURE L**).
- b) The **Manager: Building Development Management** supported the application subject thereto *that the facility must comply with SANS 10400 – Part S (facilities for disabled person)* (see **ANNEXURE M**, memo dated 29 August 2018)
- c) The **Manager: Fire Services** supported the proposal (see **ANNEXURE N**)
- d) The **Manager: Health Department (Winelands District)** supported the proposal (see **ANNEXURE O**)
- e) The **Manager: Community Services (Parks)** supported the proposal (see **ANNEXURE P**).
- f) The **Manager: Spatial Planning** supported the proposal subject to the following conditions (see **ANNEXURE Q**, memo dated 14 November 2019):
  - i) *The mitigation recommendation as contained in the visual impact assessment be implemented.*
  - ii) *The mitigation measures contained in the Heritage Impact Assessment be implemented.*

g) The **Director: Engineering Services** supported the proposal subject to the following conditions (see **ANNEXURE R**, memo dated 18 October 2019):

i) Waste Water and Sewage

*A technical report by a suitable qualified professional, regarding the "package plant" proposed in your letter must be submitted for approval, prior to the acceptance of any building plans, and prior to the installation thereof.*

ii) Water

*The source of potable water indicated in this application is borehole water. The quality of the water stored and distributed by the owner has to comply with SANS 241 Drinking Water Quality Standards. Current proof of compliance must be available on request.*

iii) Solid Waste

*Solid waste must be removed from the site to a lawful solid waste disposal site in accordance with the requirements of section 26 of the National Environmental Management Waste Act 2008 (Act 59 of 2008)*

iv) Roads

*Application to be referred to the District Roads Engineer for comment. Any conditions set by the District Roads Engineer will be applicable.*

*Prior to commencement of any demolition/construction work, a traffic accommodation plan for the surrounding roads must be submitted to the Directorate: Infrastructure Services for approval.*

v) Storm water Management

*The geometric design of the roads, parking area and grave layout must ensure that no trapped low-points are created with regard to storm water management.*

## **5. Response by Applicant to Comments Received.**

- CK Rumboll's comment on Francois Malan's remarks (see **ANNEXURE S**):

The applicant stated that the name of the cemetery has not yet been decided on and that it may first have to go through a public participation process. The applicant also confirms that the proposed

chapel will blend in with the surrounding rural setting and final proposals will only be submitted once all approvals are in place.

- CK Rumboll's comment on Marthinus Saunderson's remarks (see **ANNEXURE S**):

The actual costs can only be provided after the necessary tenders have been put in place for the various works to be performed. The tenders can only be finalized if and after all approvals have been obtained and the funds have been budgeted for. The proposal was sent to the Department of Agriculture who supported the application, subject to certain conditions (see **ANNEXURE H**).

## **PART G: ASSESSMENT OF LAND USE AND LAND DEVELOPMENT APPLICATION**

### **1. Legislative and Policy Context of land use and land development application**

The legislative/ principles/ policies/ guidelines/ plans which are considered as relevant to the subject land use and land development application, are as follows:

- Stellenbosch Municipality Land Use Planning Bylaw, 2015
- Zoning Scheme Regulations promulgated in terms of Section 8 of LUPO (at the time of submitting the application)
- Stellenbosch Municipal Integrated Development Plan (2017 – 2022)
- Stellenbosch Municipality Spatial Development Framework (2018)
- National Environmental Management Act, 1998 (Act No 107 of 1998)
- National Water Act, 1998 (Act No. 36 of 1998)
- Subdivision of Agricultural Land (Act 70 of 1970)

### **2. Assessment of grounds of the land use and land development application**

The property is approximately 40ha, of which ±17,46ha is proposed for the development of the public cemetery and memorial park. The 40ha includes buffer and setback areas. Associated setbacks and wetland areas will thus be accommodated as part of the park. An ephemeral stream runs almost parallel to the western boundary of the site. This stream is degraded and will be rehabilitated and restored as part of the development.

The 40ha site is divided into seven (7) zones, each zone with its own unique usage. The seven (7) zones are as follows:

	<b>Zone</b>	<b>Size</b>	<b>Usage</b>
1.	Memorial Park Centre Zone	±0,403ha	Within this zone a chapel, offices, storage, toilets and gathering spots will be provided for.
2.	Service Zone	±1,415ha	Workshop and storage; office; holding nursery; staff accommodation
3.	Defined Zone	±0,692ha	This zone caters for the need to have family/group and or farm burials.
4.	Columbarium Zone	±0,751ha	This zone caters for a more modern approach to the conventional burial method by catering a niche, memorial walls and floor panels
5.	Traditional Grave Zone	±9,421ha	This zone caters for the more conventional way of burial.
6.	Informal Zone	±13,114ha	Provision is made for more modern and less demanding ways of burial by means of lawn graves and the utilization of trees as headstones. Future expansion, parkland, eco-rehabilitation/education and heritage conservation is also considered within this zone. Of this area ±6,2ha will be utilized for burial purposes.
7.	Drainage & Wetland	±10,711ha	No development will take place within this zone with the main focus being rehabilitation of the seasonal stream
	The Remainder of Farm	±3,893ha	Constitutes access road, parking areas and internal roads.

There is currently a shortage of land within Stellenbosch Municipality for the development of public cemeteries. The existing public cemeteries within Stellenbosch Municipality are nearing maximum capacity and alternative land for public cemeteries is needed. The proposal will address the limited burial space within the municipality. The specialist studies conducted during the EIA process has informed the layout of the site to avoid and mitigate impacts and provide the best practicable environmental option.

## 2.1 SPLUMA Principles

### 2.1.1 Spatial Justice:

The property in question will be put to better use to provide a needed community service to Stellenbosch Municipality and its inhabitants. The new regional site is highly accessible and the development will create much needed grave space (social amenity need) as the current cemeteries are reaching capacity.

### 2.1.2 Spatial Sustainability:

The proposed rezoning will not affect any natural habitat, ecological corridors or high potential agricultural land. The development attempts to ensure that citizen's needs are met in an affordable way and to promote viable cities.

### 2.1.3 Efficiency:

The proposed development will optimise the use of existing resources and infrastructure. Due to the important role that cemeteries play in a community, it is imperative that cemeteries be located within an acceptable distance to the community it serves.

### 2.1.4 Spatial Resilience:

The proposed development does not limit future benefits that the properties may have.

### 2.1.5 Good Administration:

The proposed application will be taken through the public process by Stellenbosch Municipality and CK Rumboll and Partners and all relevant departments were contacted. The decision making process will be guided by statutory land use planning systems.

## 2.2 Applicable MSDFs

The area falls outside the urban edge and within an agricultural zone with a dominant rural character. Cemeteries need not to be developed with urban areas but can effectively be provided in the hinterland as long as the format or the cemetery respects the rural setting. The location within the rural land between urban settlements is supported from a long term planning perspective and the cemetery plan was undertaken with a view to create a landscape park that would contribute to the rural quality of the area.

The development is not in conflict with any development proposals set out for Koelenhof in the SDF, and it is also not inconsistent as the proposed development is adhering to one of the principles that guide development in the Stellenbosch area, namely optimal land use.

### **2.3 Applicable planning policies and guidelines**

The Integrated Development Plan (IDP) specifies that Council must develop and implement a social infrastructure master plan for the upgrading and maintenance of social facilities in all wards as part of dignified living.

### **2.4 Service infrastructure capacity and sustainability**

A Services Report was conducted by iX Engineers Infrastructure Excellence (see **ANNEXURE T**). The engineering services are adequate for the proposed cemetery.

### **2.5 Any investigations carried out in terms of other laws that are relevant to the consideration of the subject application (e.g. EIA, TIA, HIA etc.)**

A **Traffic Impact Study** was done by Surgeon Consulting (see **ANNEXURE U**). The findings and recommendations can be summarized as follows:

- To allow for the development it is proposed that a municipal street be constructed along the northern boundary of the site. To achieve this, the 2012 AMP proposed future roundabouts/intersection needs to be relocated.
- The impact of the relocation will have a limited impact on access spacing and still comply with the Access Management Guidelines.
- The intersection will require a right turn lane for traffic travelling north on MR174. A left turn taper is proposed on the northern leg. The realignment of the farm access to the west will have to coincide with the construction of the intersection.

- The report shown that the proposed development can be accommodated by the adjacent transport network provided the recommendations presented in the report are implemented.
- From a traffic engineering perspective, the application is supported.

A **Geotechnical Investigation** was done by Gondwana Geo Solutions (see **ANNEXURE V**). The site is considered satisfactory for the development of a cemetery.

An **Archaeological Impact Assessment** was conducted by Jonathan Kaplan (Agency for Cultural Resources Management (see **ANNEXURE V**). The archaeological visibility is extremely low due to dense vegetation cover, but indications are that the receiving environment is not a sensitive archaeological landscape.

A **Biodiversity Assessment** was done by P J J Botes of Enviro Africa (see **ANNEXURE V**). The site currently has low biodiversity significance but can be rehabilitated.

A **Botanical Statement** was done by Peet Botes of Enviro Africa (see **ANNEXURE V**). The study indicates that no natural vegetation was encountered apart from a few hardy remaining shrubs and sedges, which was mostly associated with the small seasonal stream. The site is clearly degraded to the point of being transformed. It is considered unlikely that the natural veld will ever be able to re-establish itself on the site. This report indicates that ideally one should try to rehabilitate the seasonal stream and re-establish natural riparian vegetation. However this will not happen under the current land use, but it is possible to make the stream a feature of the memorial park and to rehabilitate it to a more natural state.

A **Freshwater Assessment** was done by Joshua Gericke from EnviroSwift (see **ANNEXURE V**). The proposed development will likely result in a net positive change from the current land use (or lack thereof) in terms of freshwater impact, so long as the wetlands and drainage lines, with buffers, are incorporated within the parkland and rehabilitated.

A **Geohydrological Assessment** was done by Charles Peek and Julian Conrad of GEOSS (see **ANNEXURE V**). The majority of the site is classified as having a "low/medium" groundwater vulnerability rating. The southern portion of the site has been classified as "medium", grading into a "very high" vulnerability classification.

A **Heritage Impact Assessment** was done by Bruce Eitzen of New World Associates (see **ANNEXURE W**). The potential impact of the proposed cemetery site on the old outspan is significant in that it is a wholesale change of land from woodlot to cemetery. However, the draft concept plan allowed for the conservation of southern outspans site and surrounds in its overall framework. It would now be placed in the buffer informal parkland zone. Where the outspan site and surrounds carefully conserved and landscaped, this would retain a memory of its core purposes and allow for local associations to be retained of the site's outspan purpose and character thus mitigating associative impact and retaining landmark value.

A **Palaeontological Specialist Study** was done by Dr John E Almond from Natura Viva CC (see **ANNEXURE V**). No fossil remains were recorded on Remainder Farm No. 29 during the site visit. It is concluded that the palaeontological sensitivity of the memorial park study is very low.

A **Visual impact Assessment** was done by Bruce Eitzen of New World Associations (see **ANNEXURE W**). The proposed development will have a moderate impact on the landscape, causing some change to the visual environment. The development has moderate to high visual exposure, moderate visual absorption capacity, and medium compatibility and is moderately to high visible (R304).

The following recommendations are made to minimize visual and aesthetic impact: *taller structures should be set back from the road; the landscape buffers along the edges are very important (should be well planted); lighting should be carefully managed to prevent excessive lighting; colouring of structures and fences should be shuttle; where possible, greenery should be maximise; the use of permeable paving is recommended; protect natural vegetation; prevent pollution; monitor the landscape, soils and vegetation.*

A **Socio-economic study** was done by Anelia Coetee of LEAP (see **ANNEXURE V**). There were 11 potential benefits (*increase in job and skill levels; creation of social space; continuation of social network; equality and exclusivity; employment of equity of vulnerable groups; use of social amenities; positive change in sense of place; preservation of social history; access to leisure opportunities; access to natural resources; sales and GGP*) and 3 potential negative impacts (*crime; neglect, individual and family changes; dust and noise levels*) identified for the proposed development.



## **2.6 The applicable provisions of the zoning scheme**

The property is currently zoned Agricultural Zone I but has not been used for agriculture purposes for some time. It is proposed to rezone the property to Open Space Zone II for private open space purposes. Private open space means any land which has been set aside in the scheme for utilization primarily as a private site for sports, play, rest or recreational facilities or as an ornamental garden or a pleasure garden and includes public land which is or will be leased on a long term basis and a cemetery, whether public or private.

## **2.7 General desirability in accordance with possible impacts on neighbouring properties and surrounding areas.**

### Compatibility with surrounding area

Even though the property is surrounded by agricultural properties the proposed use will not have a negative impact on the surrounding area as the format of the cemetery compliments the rural setting. The intention is to develop a park-like landscape rather than a conventional cemetery.

### Visual Impact

The proposed cemetery will be set back from the R304 in an attempt to respect the visual character of the area since it is located within a rural area and along a declared scenic route. The subject property is covered by gum and acacia plantation and has an untidy, overgrown atmosphere. The change in use will enhance the landscape character of the site. The activities on site could easily be hidden behind decent landscaping, where structures are low with the exception of a chapel facility. The proposed layout and landscaping shields the development and would thus have a minimum visual impact on the surrounding properties as well from the R304.

### Noise pollution

Normal traffic noise associated with motorcade to the cemetery will result along the R304. Minimal noise levels during burial ceremonies are therefore expected. The activity will not create any emissions or odours that are not typical of a cemetery. Please note that no crematorium is proposed. A landscaped buffer along the perimeter of the cemetery is to be implemented to reduce possible noise levels. There will be an increase in noise levels during the construction phase, but the noise mitigation measures will be dealt with in the Environmental Management Plan.

### Access

Access control to the proposed development will likely be facilitated via fencing/palisade fencing and a lockable gate with a security guard on duty. This also provides a local employment opportunity.

### **3. Assessment of comments on application**

No objections had been received against the proposed cemetery but two comments were received from the interested and affected property owners. The comments were with regards to the name of the cemetery; the design and height of the chapel, total cost to establish the park as well as the future maintenance cost. A visual impact assessment was undertaken and mitigation measures were proposed to reduce the visual impact of the cemetery. The actual costs can only be provided after the necessary tenders have been put in place for the various works to be performed. The tenders can only be finalized if and after all approvals have been obtained and the funds have been budgeted for.

The Department of Water Affairs had certain comments on the proposal and these comments were fully addressed by the applicant. The comments were sent to the Department of Water Affairs and Forestry on 15 November 2019 and no amended comments were received. See **ANNEXURE Y**.

All the other internal and external department's comments were taken into account and will be imposed as conditions of approval, if necessary

### **4. Additional planning evaluation for removal of restrictions**

Not applicable.

## **PART H: SUMMARY OF KEY FINDINGS OF ASSESSMENT**

**After having independently considered and weighted all the relevant information the evaluation of the subject land use and land development application concludes that:**

1. The cemetery establishment aims to cater for the community needs within the municipal area.

2. The memorial park serves as a greener approach to the establishment of traditional burial grounds, whilst promoting and alternate, less land demanding option for burial and remembrance.
3. The proposed area serves to be the best option as it is not utilized for agricultural purposes with the site being infested with Blue Gum- and Port Jackson trees. No viable agricultural land will therefore be lost.
4. A number of job opportunities are expected to be created during the construction phase.
5. The area falls outside the urban edge and within an agricultural zone with a dominant rural character. Cemeteries need not to be developed with urban areas but can effectively be provided in the hinterland as long as the format or the cemetery respects the rural setting.
6. The proposed public cemetery and memorial park will have a medium impact and significance on the landscape in terms of the visual impact associated with the development.
7. The proposed use will not have a negative impact on the surrounding area as the format of the cemetery compliments the rural setting.
8. Various specialist studies were undertaken and concluded in preparation for the plan for the new cemetery. The findings of the studies were taken into account.
9. The proposed cemetery is not inconsistent with the provisions of the SDF as the proposed development is adhering to one of the principles that guide development in the Stellenbosch area namely "optimal land use".

## PART I: RECOMMENDATION

1. That the application for **Rezoning** in terms of Section 15(2)(a) of the Stellenbosch Municipal Land Use Planning Bylaw, 2015 on Remainder Farm No. 29, Stellenbosch Division for **Agricultural Zone I** to **Open Space Zone II** to allow for a public cemetery and memorial park **BE APPROVED** in terms of Section 60 of the said Bylaw for the following reasons:
  - 1.1 There is a great need for cemeteries in the Stellenbosch area.
  - 1.2 The property will be put to better use to provide a needed social service to Stellenbosch Municipality and its inhabitants.

- 1.3 The proposed rezoning will not affect any natural habitat, ecological corridors or high potential agricultural land and no viable agricultural land will be lost.
- 1.4 The proposed development will optimise the use of existing resources and infrastructure.

**2. That such approval BE SUBJECT to the following conditions in terms of Section 66 of the said Bylaw:**

- 2.1 The approval applies only to the rezoning in question, and shall not be construed as authority to depart from any other legal prescriptions or requirements from Council;
- 2.2 That the neighbouring farms right to farm and that what is normally associated with that (including boreholes, farm infrastructure and day to day farming activities but not limited to) be protected at all cost and that the cemetery and use thereof not impede in any way possible and that the owners/managers and successors in title agree to that.
- 2.4 The following conditions imposed by the **Manager: Spatial Planning** in their memo dated 14 November 2019, attached as **Annexure Q** be adhered to:
  - a) *The mitigation recommendation as contained in the visual impact assessment be implemented*
  - b) *The mitigation measures contained in the Heritage Impact assessment be implemented.*
- 2.5 The following conditions imposed by the **Director: Engineering Services** in their memo dated 18 October 2019, attached as **ANNEXURE R** be adhered to:
  - a) *Waste Water and Sewage*  
*A technical report by a suitable qualified professional, regarding the "package plant" proposed in your letter must be submitted for approval, prior to the acceptance of any building plans, and prior to the installation thereof.*

b) *Water*

*The source of potable water indicated in this application is borehole water.*

*The quality of the water stored and distributed by the owner has to comply with SANS 241 Drinking Water Quality Standards. Current proof of compliance must be available on request.*

c) *Solid Waste*

*Solid waste must be removed from the site to a lawful solid waste disposal site in accordance with the requirements of section 26 of the National Environmental Management Waste Act 2008 (Act 59 of 2008)*

d) *Roads*

*Prior to commencement of any demolition/construction work, a traffic accommodation plan for the surrounding roads must be submitted to the Directorate: Infrastructure Services for approval.*

e) *Storm water Management*

*The geometric design of the roads, parking area and grave layout must ensure that no trapped low-points are created with regard to storm water management.*

2.6 A detailed landscaping and site development plan, indicating the details of the proposed land development including the site layout, position and height of buildings and structures, property access, building designs and landscaping, be submitted to the Directorate of Planning and Economic Development for approval;

2.7 The approval will lapse if not implemented within the timeframe stipulated in the subject Bylaw; and

2.8 Building plans will only be approved when all conditions of approval have been complied with.

3. Matters on the application **TO BE NOTED:**

3.1 The conditions imposed by the **Department of Environmental Affairs and Development Planning** in their letter dated 20 September 2019 (Environmental Authorisation), attached as ANNEXRE G **BE NOTED.**

- 3.2 The conditions stated in letter 20/9/2/5/6/904 by the **Department of Agriculture (Elsenburg)**, dated 17 January 2020, **BE NOTED**. See **ANNEXURE H**.
- 3.3 The conditions stated in letter TPW/CFS/RP/LUD/REZ/SUB-25/342 by the **Department of Transport and Public Works** dated 15 November 2019, BE NOTED. See **ANNEXURE K**.
- 3.4 A water use authorisation must be applied for and obtained prior to construction taking place.
- 3.5 *The application must be referred to the District Roads Engineer for comments and any conditions set by the District Roads Engineer will be applicable.*

## PART J: ANNEXURES

ANNEXURE A	:	LOCALITY PLAN
ANNEXURE B	:	SITE DEVELOPMENT PLAN
ANNEXURE C	:	MOTIVATION
ANNEXURE D	:	COPY OF TITLE DEED/CONVEYANCER CERTIFICATE
ANNEXURE E	:	PUBLIC PARTICIPATION PROCESS
ANNEXURE F	:	COMMENT FROM INTERESTED AND AFFECTED PROPERTY OWNERS
ANNEXURE G	:	COMMENT FROM THE DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING
ANNEXURE H	:	COMMENT FROM DEPARTMENT OF AGRICULTURE (ELSENBURG)
ANNEXURE I	:	COMMENT FROM THE HERITAGE WESTERN CAPE
ANNEXURE J	:	COMMENT FROM STELLENBOSCH HERITAGE FOUNDATION
ANNEXURE K	:	COMMENT FROM THE DEPARTMENT OF TRANSPORT AND PUBLIC WORKS
ANNEXURE L	:	COMMENT FROM THE MANAGER: COMMUNITY SERVICES
ANNEXURE M	:	COMMENT FROM THE MANAGER: BUILDING

		MANAGEMENT
ANNEXURE N	:	COMMENT FROM THE MANAGER: FIRE SERVICES
ANNEXURE O	:	COMMENT FROM THE HEALTH DEPARTMENT (CAPE WINELANDS)
ANNEXURE P	:	COMMENT FROM THE MANAGER: COMMUNITY SERVICES (PARKS)
ANNEXURE Q	:	COMMENT FROM THE MANAGER: SPATIAL PLANNING
ANNEXURE R	:	COMMENT FROM THE DIRECTOR: ENGINEERING SERVICES
ANNEXURE S	:	RESPONSE ON COMMENT RECEIVED
ANNEXURE T	:	ENGINEERING SERVICES REPORT
ANNEXURE U	:	TRAFFIC IMPACT STUDY
ANNEXURE V	:	OTHER STUDIES
ANNEXURE W	:	HERITAGE IMPACT STUDY
ANNEXURE X	:	VISUAL IMPACT ASSESSMENT
ANNEXURE Y	:	LETTER TO DEPARTMENT OF WATER AFFAIRS AND FORESTRY

**PART K: COMPILATION OF PLANNING APPLICATION ASSESSMENT REPORT**

**APPLICATION FOR REZONING FROM AGRICULTURAL ZONE 1 TO OPEN SPACE ZONE II  
FOR THE ESTABLISHMENT OF A PUBLIC CEMETERY AND MEMORIAL PARK: REMAINDER  
FARM NO. 29, STELLENBOSCH DIVISION**

**Author of Planning Assessment Report:**

**Name:** Louisa Guntz

**Capacity:** Senior Planner

**Signature:** 

**Date:** 12/06/20

**PART I: SUBMISSION OF PLANNING APPLICATION ASSESSMENT REPORT****APPLICATION FOR REZONING FROM AGRICULTURAL ZONE 1 TO OPEN SPACE ZONE II  
FOR THE ESTABLISHMENT OF A PUBLIC CEMETERY AND MEMORIAL PARK: REMAINDER  
FARM NO. 29, STELLENBOSCH DIVISION****Authorised Employee to assess and make a recommendation on a land use and land development application for consideration by the authorised decision maker:**

As the duly authorised official in terms of Section 56 of the Stellenbosch Municipal Land Use Planning Bylaw (2015) to assess and make a recommendation on the above planning application, the subject planning report is hereby submitted for consideration to the duly authorised decision maker in accordance with the Categorisation Model for Land Use and Land Development Applications as approved by the Stellenbosch Municipality in accordance with Section 69(1) of the said Bylaw.

In terms of the Categorisation Model duly approved in terms of Section 69(1) of the said Bylaw vide Item 7.7.1 and dated 8 April 2020, the subject application is categorised as follows:

**Category:** A5

**Decision Making Authority:** SMPT

**Rational:** Council owned property and project is initiated by Council

**Name:** Stiaan Carstens

**Capacity:** Senior Manager: Development Management

**SACPLAN Registration:** A/1551

**Signature:** 

**Date:** 12/06/2020



**PART M: ADMINISTRATION OF PLANNING APPLICATION ASSESSMENT REPORT**

**APPLICATION FOR REZONING FROM AGRICULTURAL ZONE 1 TO OPEN SPACE ZONE II  
FOR THE ESTABLISHMENT OF A PUBLIC CEMETERY AND MEMORIAL PARK: REMAINDER  
FARM NO. 29, STELLENBOSCH DIVISION**

**Administrator to Stellenbosch Municipal Planning Tribunal:**

It is hereby confirmed that proper notice was served of the Municipal Planning Tribunal meeting at which this land use and land development application will serve for consideration.

The land use and land development application will serve at the scheduled meeting of the Stellenbosch Municipal Planning Tribunal on:

Date: .....

**Name:**

**Capacity:**

**Signature:**

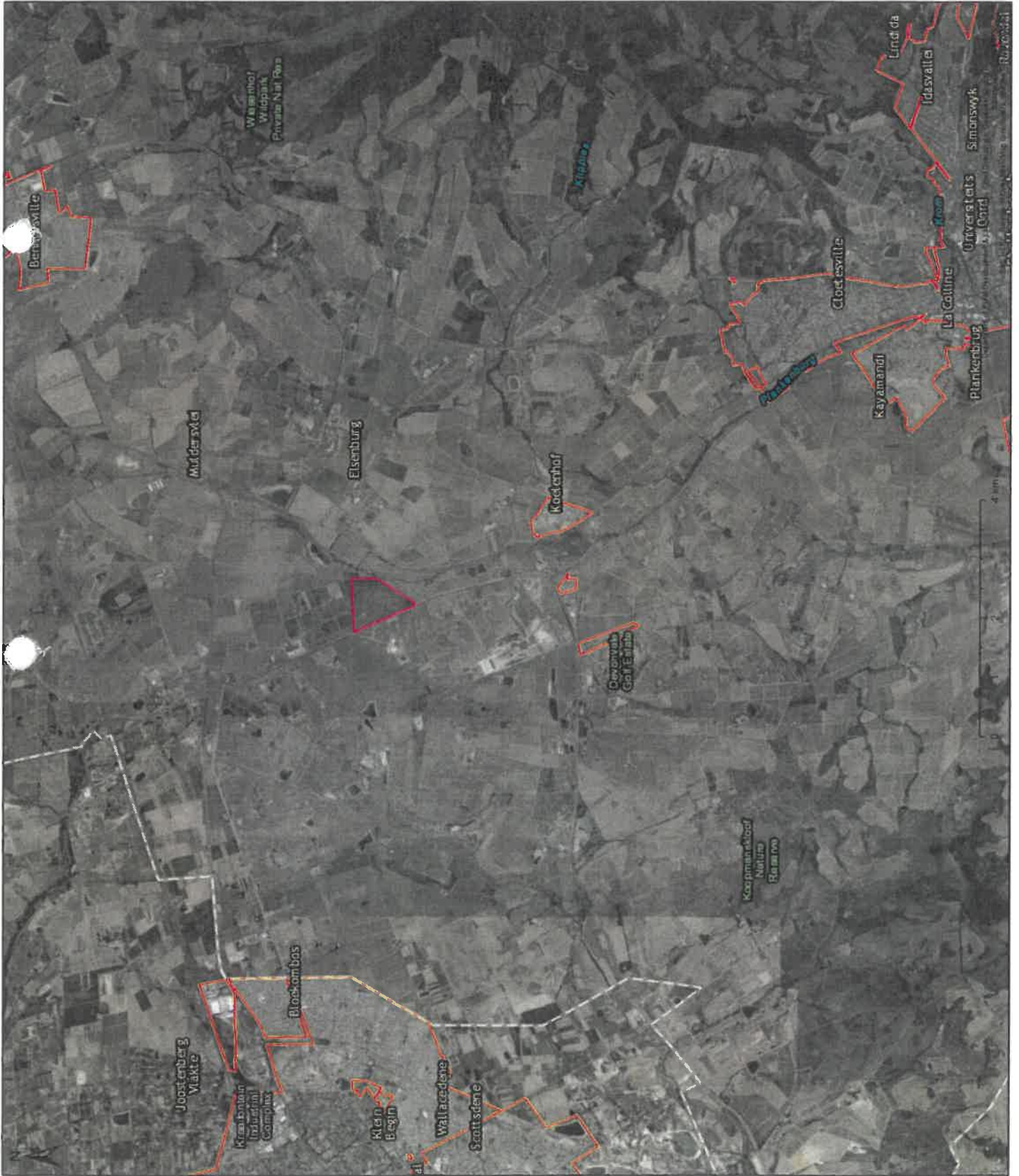
**Date:**

**ANNEXURE A**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**LOCALITY PLAN**

Legend  
□ Allotment Township



Scale: 1:59 496

Date created: February 6, 2019



Western Cape Government  
Kaapstad

**ANNEXURE B**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**SITE DEVELOPMENT PLAN**



IRRIGATION RESERVOIR

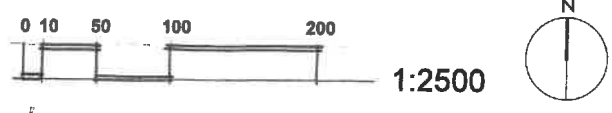
NATURAL DRAINAGE CHANNEL

RIPARIAN AREA

DELINEATED WETLANDS

WETLAND BUFFER ZONE

- LEGEND**
- A: Memorial Park Centre**
    - Chapel
    - Offices & Storage
    - Toilets
    - Gathering Space
  - B: Service Zone**
    - Workshop & Storage
    - Office
    - Holding Nursery
    - Staff Accommodation
  - C: Defined Zone**
    - Family & Groups
    - 'Fam' Cemeteries
  - D: Columbarium Zone**
    - Niche & Memorial Walls
    - Floor Panels
  - E: Traditional Graves**
    - Headstones
  - F: Informal Zones**
    - Lawn Graves
    - Trees as headstones
    - Future Expansion
    - Parkland
    - Eco-Rehabilitation / Education
    - Heritage Interpretation
  - G: Drainage & Wetland Rehabilitation**



**CALCUTTA MEMORIAL PARK**  
 DWG # 509-C4: 28-02-2019

OvP Associates . Landscape Architects  
 021 462 1262  
 C.K Rumboll & Partners . Town Planners  
 022 482 1846

**Legend:**

**A: Memorial Park Centre**

- Chapel
- Offices & Storage
- Toilets
- Gathering Space

±0.403 ha

**B: Service zone**

- Workshop & Storage
- Office
- Holding Nursery
- Staff Accommodation

±1.415 ha

**C: Define Zone**

- Family & groups
- 'Farm' Cemeteries

±0.692 ha

**D: Columbarium Zone**

- Niche & Memorial Walls
- Floor Panels

±0.751 ha

**E: Traditional Graves**

- Headstones

±9.421 ha

**F: Informal Zones**

- Lawn Graves
- Trees As Headstones
- Future Expansion
- Parkland
- Eco-Rehabilitation/Education
- Heritage Interpretation
- Toilets

±13.114ha

**G: Drainage & Wetland Rehabilitation**

**H: Transport**

- Access Road
- Internal Roads
- Bus Parking
- Parking

±10.711 ha

±3.893 ha



**ANNEXURE C**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**MOTIVATION**

## 1. INTRODUCTION

One of the future needs of the growing and urbanising populations is cemeteries. In the last 20 years or so, South Africa has experienced rapid urbanisation and an increase in deaths resulting from pandemics, such as HIV/AIDS and TB. This has led to the need for new ways of disposing of human remains. In South Africa, the bulk of the population is Christians, whose preferred mode of interment is burial. However, the downside to conventional burial is that it requires a considerable amount of land. The shortage of land for the development of cemeteries has long been one of the major challenges facing many South African Municipalities.

Urban cemeteries are filling up without room to expand, particularly due to diminishing land resources. This scarcity is caused by land that is environmentally unsuitable for burial, and because most of the available land is privately or provincially owned. Because they consume vast amounts of land and contest for space with other land uses, cemeteries can be designed and managed so as to contribute to urban resilience. For instance, innovative designs that is space-efficient, adaptable to growing burial needs, and sensitive to families' grieving processes. Beyond responding to space constraints, and without increasing acreage, some of the innovative designs could focus on greening to increase the social ecological functioning of these spaces. Having mixed uses integrated within the cemetery space ensures the adequate use of space and increases the accessibility of different services in terms of cost and time. This in turn reduces the effects of urban sprawl. Connecting these spaces with other green open spaces improves the biodiversity within them whilst also increasing their use as habitats for other species.

CK Rumboll and Partners were appointed by Stellenbosch Municipality (SM) under tender **B/SM No 17/16** for the *Identification and Acquisition of Authorisations and Approvals for the establishment of one or more Regional cemetery for Stellenbosch Municipality.*

In order to prevent future shortage of burial space, CK Rumboll assisted SM to identify suitable sites for the establishment of regional cemeteries. The strategy Stellenbosch adopted to provide burial space were twofold: Expanding local cemeteries and/or establishing regional cemeteries in Stellenbosch Municipal Area.

The following three regions were identified and sites per region were identified and assessed.

- Region 1: Northern Stellenbosch
- Region 2: Eastern Stellenbosch (Franshoek Valley)
- Region 3: South Stellenbosch



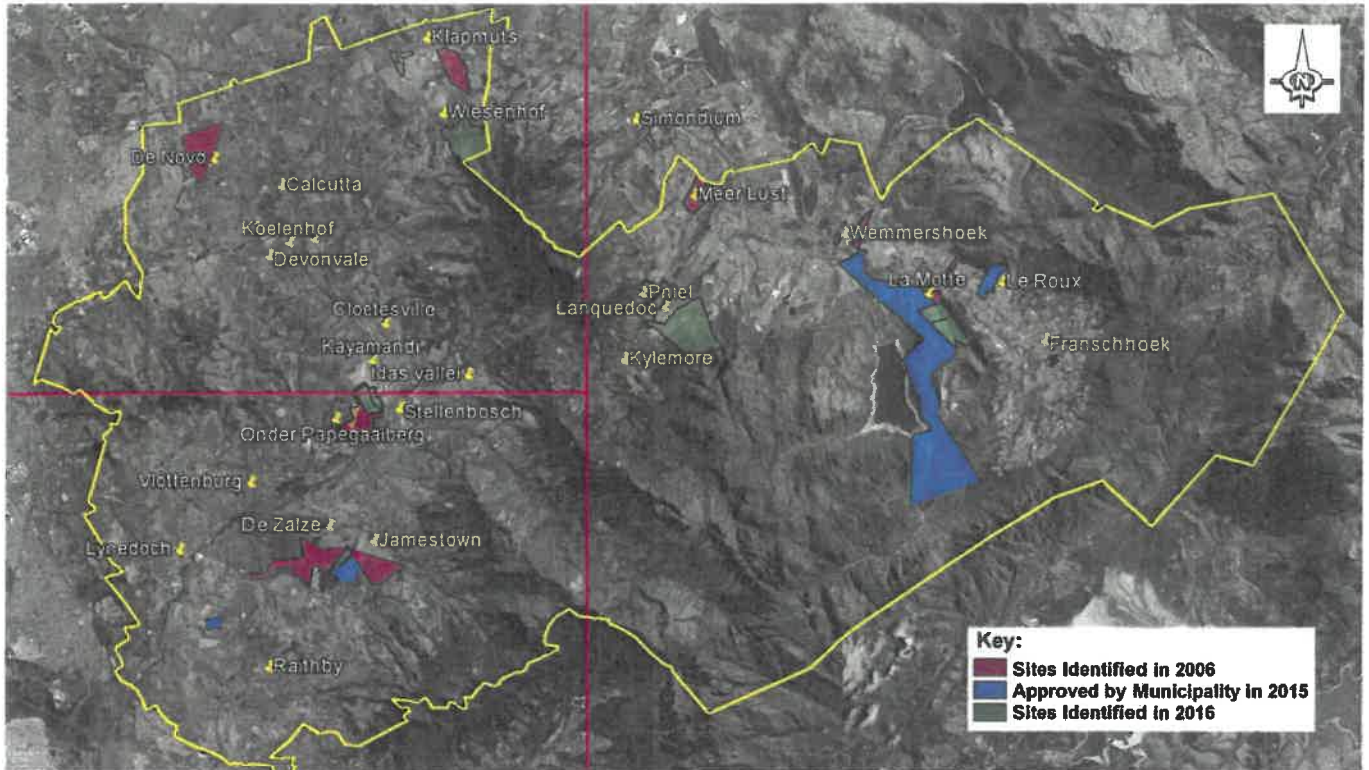


Figure 1: The site for Eastern Stellenbosch has not been promoted as yet as most of the area is located within the Berg River flood plain.

### Site Identification

Selection was informed by several studies and activities i.e.

- a) A 2006 Cemetery Feasibility Study conducted by Dennis Moss Partnership.
- b) Site visits by CK Rumboll and Partners in May and June 2016.
- c) Sites identified by the Property Management Department of Stellenbosch Municipality.
- d) Sites approved on a Stellenbosch Council meeting, various dates 2015 – 2018.

After a process of elimination, two suitable sites for regional cemeteries, namely Farm Calcutta nr 29 and Remainder Farm Louw's Bos nr 502 were identified to serve as regional cemeteries and thus make provision for the dire need of burial space as other cemeteries are fast reaching capacity. Despite the availability of various alternatives, conventional burial and funeral practices are still the most common and preferred method.



Figure 2: Farm Louw's Bos nr 502

The provision and maintenance of cemeteries, funeral parlours and crematoria is a function vested in Local Government in terms of Schedule 5 (Part B) of the Constitution of the Republic of South Africa 1996 (Act 108/1996). In 2015 there were an estimated 1600 gravesites available in existing cemeteries in the Stellenbosch jurisdictional area. Public cemeteries in the Stellenbosch Municipal area are nearing maximum occupation. Availability of land is the biggest challenge facing the cemetery sector in South Africa. The second biggest is insufficient budgetary resources. The two remaining challenges – a high rate of conventional/traditional in ground burials and community resistance to alternative forms of burial – contribute to the first. SM adopted the strategy of rather providing Memorial parks than conventional cemeteries in order to provide for all income groups, cultures and religions.

This application has as its purpose to obtain the necessary authorisations and approvals for the establishment of a Memorial Park on one of the identified portions, the Farm Calcutta nr 29, Administrative District Stellenbosch.

## 2. PURPOSE

The application entails the following:

- ✚ Rezoning of farm Calcutta nr. 29 in terms of Section 15(2)(a) of the Stellenbosch Land use Planning By-Law from Agricultural Zone I to Open Space Zone II.

The property is registered in the name of Stellenbosch Municipality. See Annexure A for application form.

## 3. PROPERTY DESCRIPTION

### 3.1 Location and surrounding land use

The site is located  $\pm 10$ km north-west of Stellenbosch to the east of Main Road 174 (R304). (Also see Annexure B). The site is occupied with Port Jackson- and Blue Gum trees that stand out from the surrounding countryside, which tends to be open fields and vineyards as can be seen in the aerial photograph below.



Figure 3: Location

Surrounding neighbours: Farm Calcutta nr 29	
NORTH	Portion 21 of farm nr 27
EAST	Remainder farm 30
SOUTH	Remainder farm 30, Farm 45
WEST	R304

**3.2 Property details**

Farm Calcutta nr 29	
Title Deed No.:	T72662/2007
Owner:	Stellenbosch Municipality
Extent:	40.4982ha
Registration Division:	Stellenbosch

**4. Current zoning and land use**

	Farm 29
Zoning	Agricultural Zone I
Land use	Vacant – covered with Blue Gum- and Port Jackson trees

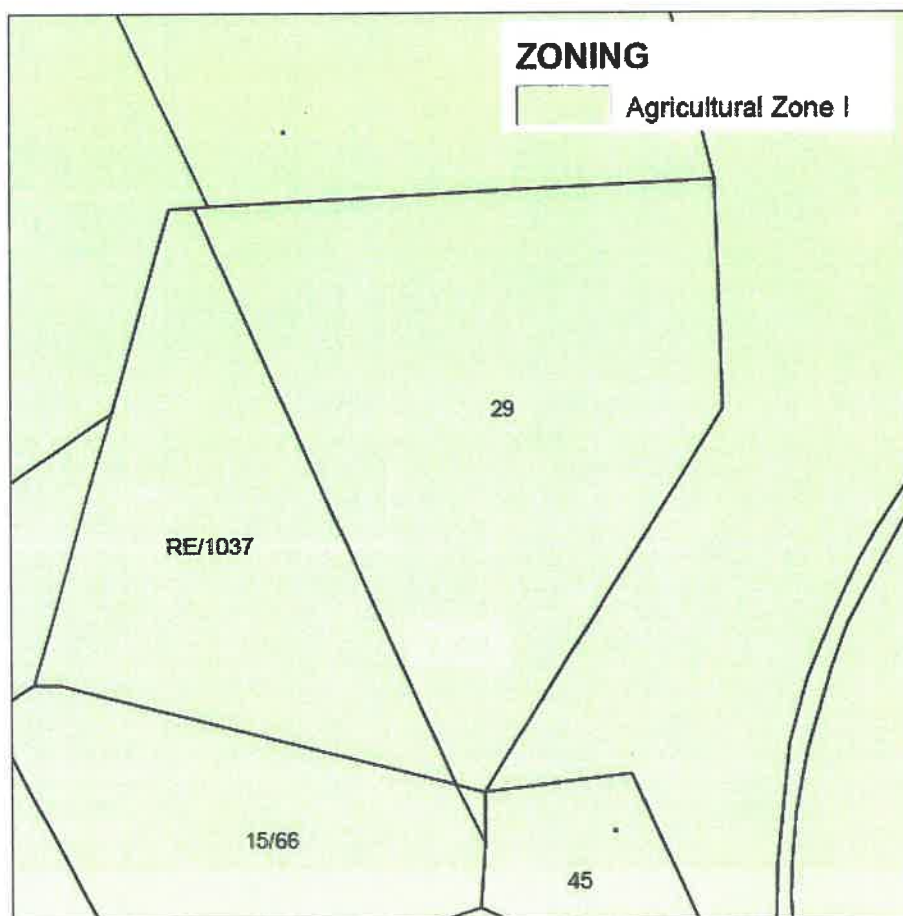


Figure 4: Zoning

The property is rural, zoned Agricultural, and lays West of Elsenburg Agricultural College. The landscape is generally scenic in a mixed agricultural setting, against the backdrop of the Stellenbosch Mountains.

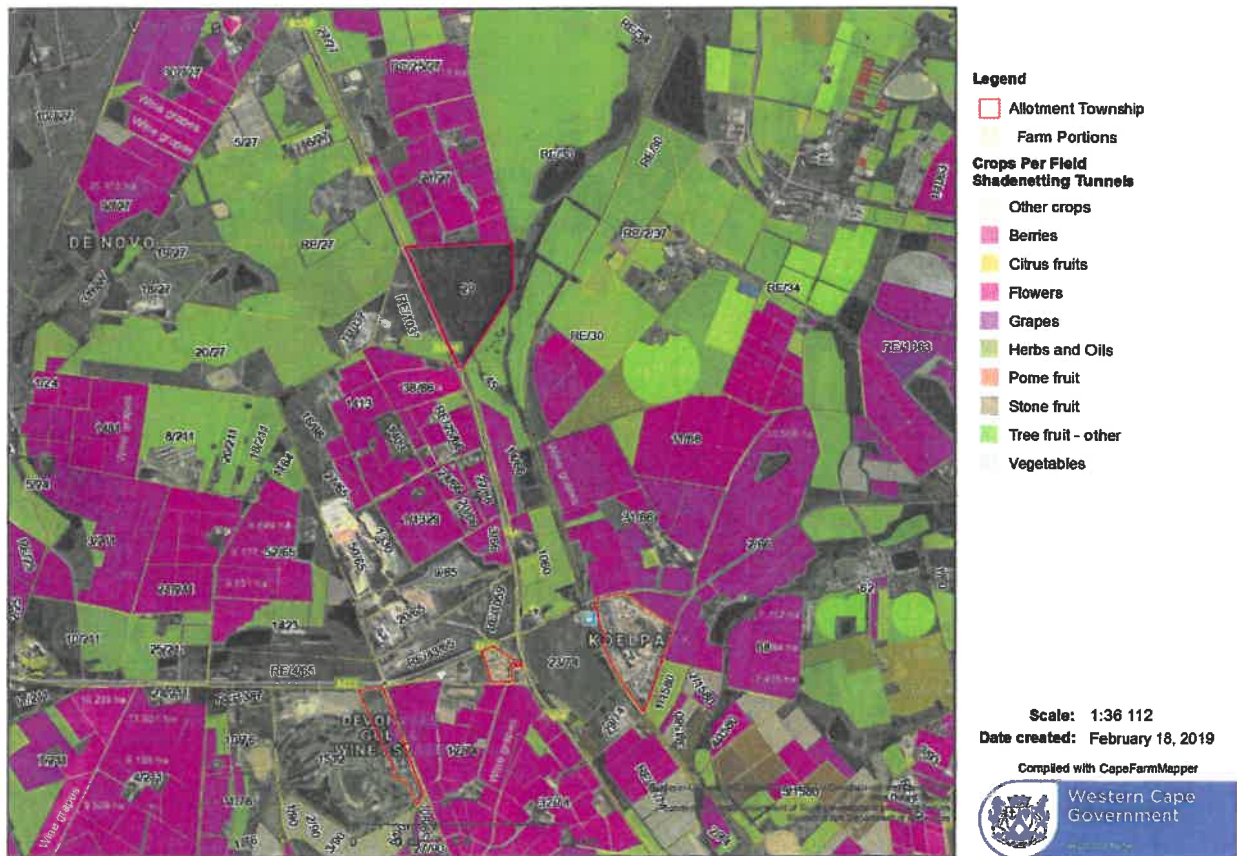


Figure 5: Surrounding land use

The property is approximately 40ha, of which  $\pm 17.46$ ha is proposed for the development of the public cemetery and memorial park. The 40ha includes buffer and setback areas. Associated setbacks and wetland areas will thus be accommodated as part of the 'park'. An ephemeral stream runs almost parallel to the western boundary of the site. This stream is degraded and will be rehabilitated and restored as part of the development.

The identified site is strategically positioned to meet the community's needs, since it services the northern region of the Municipal area, and will be relatively convenient for local communities to use.

##### 5. Current cemetery use and ways of remembering: Current trend

On average about 656 people get buried in the Stellenbosch region annually, amounting to  $\pm 54$  burials per month. Most funerals are scheduled on a weekend. With exception people are cremated, as traditional burials are the norm.

Different trends have evolved in cemeteries with the mixing of cultures and religions, as well as the social function of cemeteries. The funeral and burial services offered by municipalities cannot be decontextualised from the religious and

cultural beliefs that people hold. Outlining the current trends in burials, ashes and memorial options allows us to gain a better understanding of what today's society is looking for. The following trends listed are seen as the most common:

### 5.1 Memorial Garden

- Ashes in garden beds.
- A plaque in front of garden beds.
- Interment of ashes and a plaque is placed on rocks in the garden bed nearby.



Memorial Garden

### 5.2 Memorial Tree Plaque

- Memorial plaques are placed at the base of each tree.



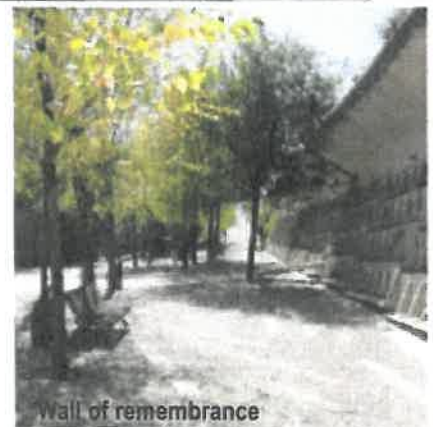
Memorial tree and plaque

### 5.3 Columbarium

- Room or building with niches for funeral urns to be stored.
- Niche and Wall of Remembrance →
- A wall structure with ashes placed within and covered with a plaque.



Columbarium



Wall of remembrance

#### 5.4 Lawn Cemetery

- Lawn area with plaques or plinths.



Lawn cemetery

#### 5.5 Headstone Graves

- Traditional graves.
- Monumental graves.
- Family groupings.



Monumental headstone graves

#### 5.6 Natural Burial

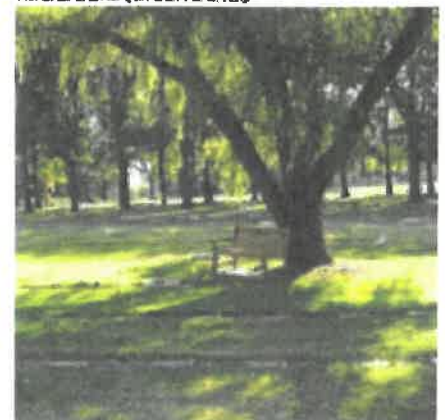
- Locally made natural casket.
- Indigenous landscape.
- Option of plaque.



Natural burial (Green burial)

#### 5.7 Dedication Seat

- Personalised plaques on each bench.
- Benches are positioned throughout the cemetery in sheltered positions.
- Remembrance of many generations.



Dedication Seat

The proposed Calcutta public cemetery and memorial park aims to promote a more modern concept to that of traditional public cemeteries by including some or all modern trends as listed above.

## 6. Proposed Development

- CK Rumboll and Partners together with Stellenbosch Municipality identified a suitable site through a process of elimination that is situated north-west of Stellenbosch. This portion of land is registered in the name of Stellenbosch Municipality (See **Annexure C** for title deed and diagram). The said portion of land is zoned Agricultural Zone I and requires to be rezoned to Open Space Zone II. Application is made for the rezoning of the entire property.

Despite the availability of various alternatives, conventional burial and funeral practices are still the norm and preferred option. The strategy employed by SM was to expand local cemeteries where possible as a short term solution, whilst establishing at least two new regional cemeteries. Human death and burials are part of human life, while cemetery management is part of human settlement development. The main challenge facing cemetery management today is striking an acceptable balance between spiritual, religious and cultural practices and the present and future availability of land for cemeteries.

The Calcutta site is degraded and heavily invested with alien Blue Gum- and Port Jackson Trees. Clearance of the property for the proposed development will facilitate the reintroduction of indigenous vegetation in the landscaped areas as indicated in the proposed SDP attached as **Annexure D**. As Stellenbosch Municipality strives to keep the region green, the proposed memorial park is well suited.

Besides allocating areas for traditional burial methods and a remembrance wall a garden of remembrance (Memorial Garden) will be established where the ashes of loved ones may be buried at the foot of a tree or shrub indigenous to the area. The garden of remembrance will follow a landscaped plan and patrons may purchase a tree to serve as a living memory of their loved one. It also serves as a greener approach to the establishment of traditional burial grounds, whilst promoting an alternate, less land demanding option for burial and remembrance.

A seasonal stream is running through the western portion of the development site and will be rehabilitated, with an access bridge to be built over the water course. No other development will take place within the 32m setback required for watercourse conservation. To the west of the stream, it is proposed that burial tree areas, forming part of the 'public park' area of the memorial park, be established. Several walkways and seating benches within the public cemetery and memorial park will be made available.

It is proposed that the memorial park be an area where critical areas of biodiversity and heritage are rehabilitated and preserved. Community or social utilisation of the memorial park, other than for burial/remembrance purposes is



advocated through the rehabilitation and preservation of the "Outspan" heritage significance of particularly the south-western section of the development site.



Figure 6: Site development Plan (OVP Associates, February 2019)

The 40ha site is divided into 7 zones, each zone with its own unique usage. The proposed Calcutta public cemetery and memorial park, aims to promote a more modern concept to that of traditional public cemeteries.

**Usage Zones:**1. Memorial Park Centre Zone – ±0.403ha

Within this zone a chapel, offices, storage, toilets and gathering spots will be provided for.

2. Service Zone - ±1.415ha

The following uses will be provided for:

- Workshop and storage
- Office
- Holding Nursery
- Staff accommodation

3. Defined Zone - ±0.692ha

This zone caters for the need to have family/group and or farm burials.

4. Columbarium Zone - ±0.751ha

This zone caters for a more modern approach to the conventional burial method by catering for a niche, memorial walls and floor panels.

5. Traditional Graves Zone - ±9.421ha

This zone caters for the more conventional way of burial and represents % of the overall memorial park.

6. Informal Zone - ±13.114ha

Within this zone provision is also made for more modern and less demanding ways of burial by means of lawn graves and the utilisation of trees as headstones. Future expansion, parkland, Eco-rehabilitation/education and heritage conservation is also considered within this zone. Of this area ±6.2ha will be utilised for burial purposes.

7. Drainage & Wetland - ±10.711ha

No development will take place within this zone with the main focus being rehabilitation of the seasonal stream.

The remainder of the farm, ±3.893ha, constitutes access roads, parking areas and internal roads.

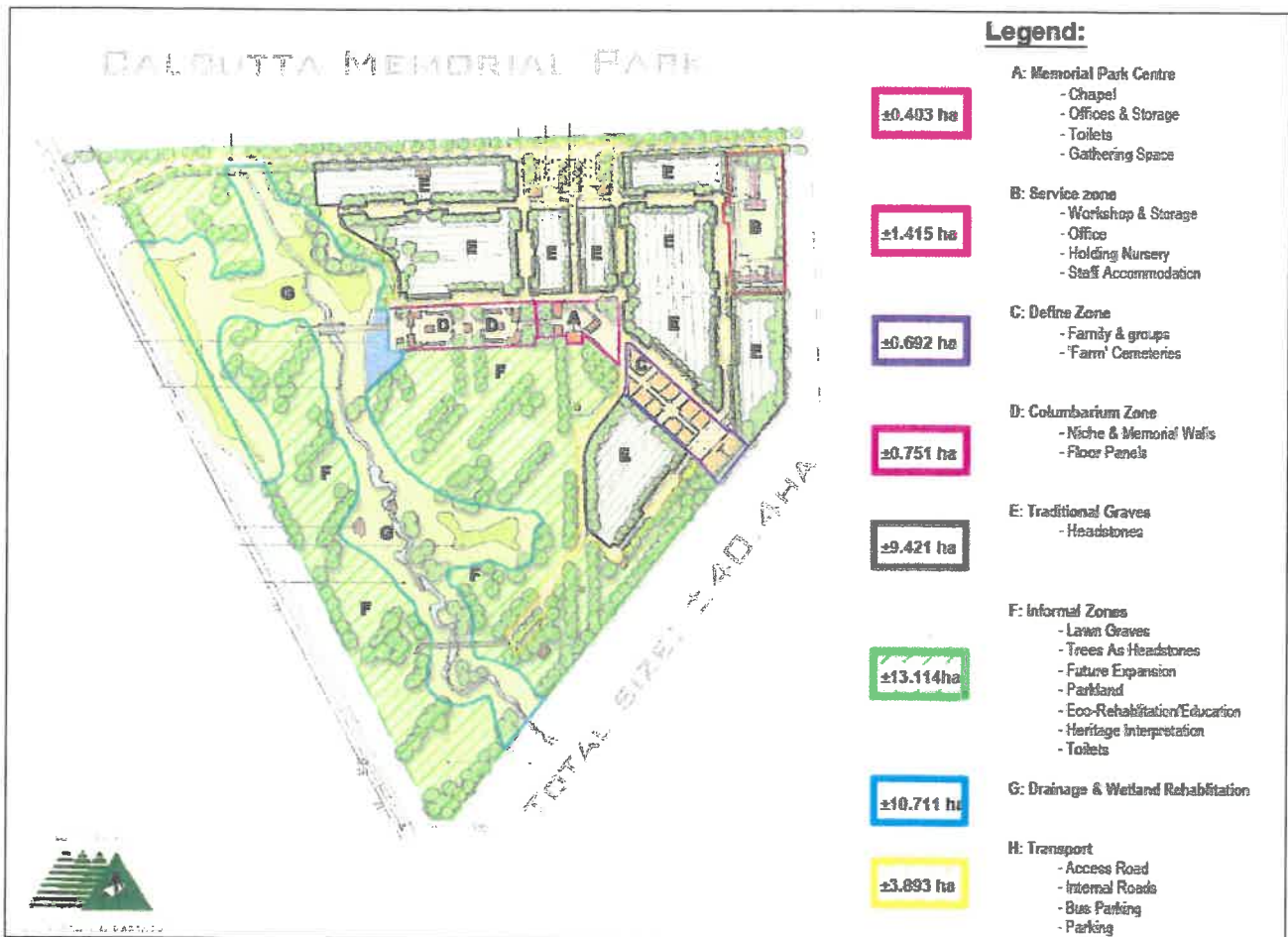


Figure 6: Development Zones

## 7. Need and Desirability

Factors that need to be taken into consideration when developing a cemetery site as per *Guidelines for Human Settlement Planning and Design*, CSIR Building and Construction Technology, 2000 are as follows:

- The size and nature of the cemetery site.
- Accessibility to the population being served and the impact on the transportation system.
- The effect of the cemetery on the adjacent resources and land-uses.
- The provision of a cemetery facility taking into account the local and micro environment and amenities.
- The spatial integration of a cemetery facility as part of an open space network and the provision of an appropriate buffer zone.

### 7.1 Size and nature cemetery

At 1 000 deaths per 100 000 population per annum (rounding off the death rate to 1%) 6 000m<sup>2</sup> grave space per annum will be required. At 656 deaths per 100 000 per annum 3 936m<sup>2</sup> grave space per annum will be required. Over the next 30 years 11.8ha of land will be required. Should all amenities and parking be included in the provision per

grave the hectares of land required is adjusted to 8m<sup>2</sup> resulting in 16ha of land. The proposed regional site should provide sufficient cemetery space for the next 30 years.

Refer to Annexure D for site plan.

## 7.2 Access and public transport

There is currently no direct access to this portion of land from the R304 (MR174).

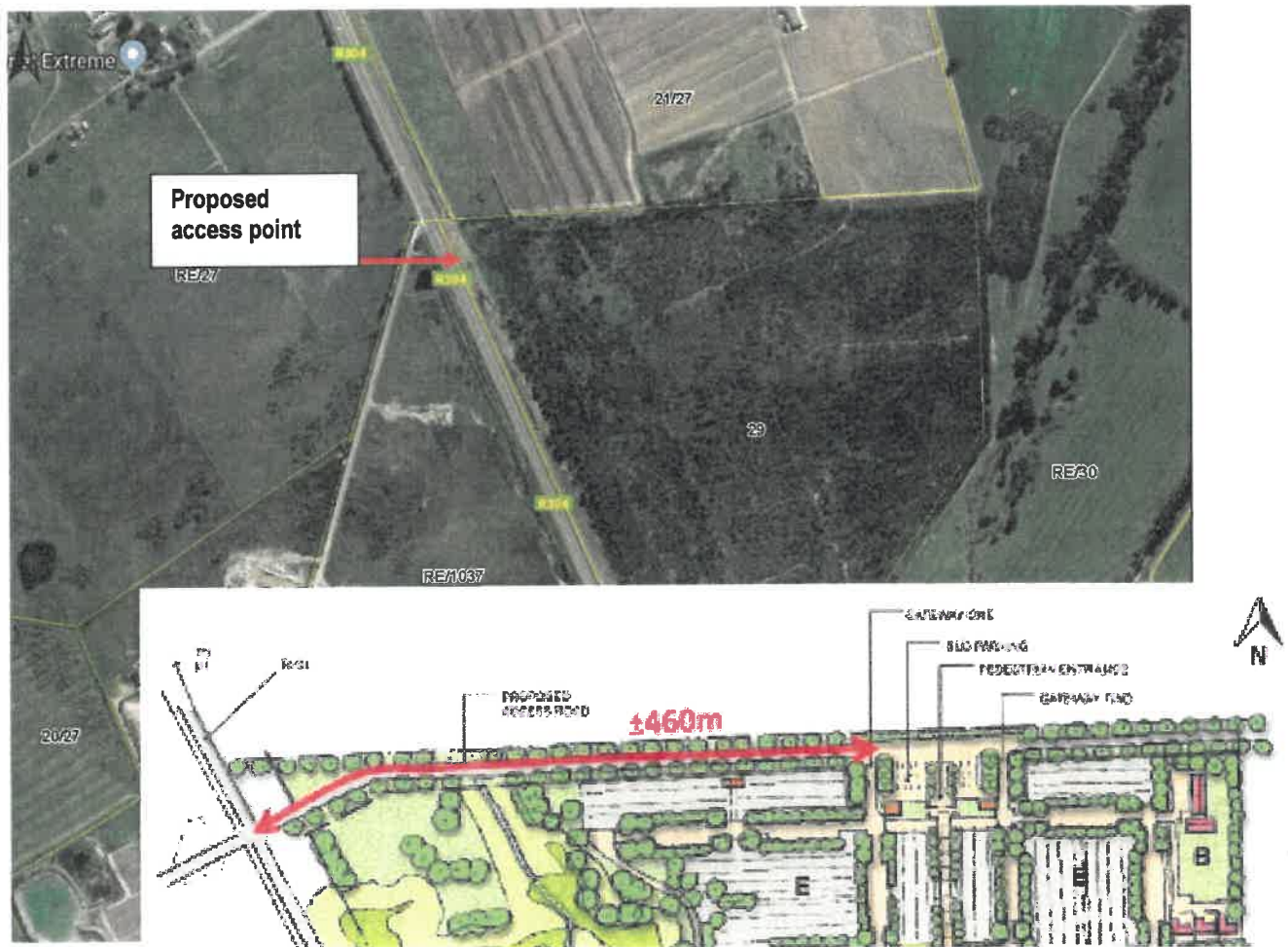


Figure 7: Proposed access

In 2012 ITS Engineers compiled an Arterial Management Plan (AMP) for Main Road 174 between Klipheuwel and Stellenbosch. The AMP suggested a future roundabout or signalised intersection off MR 174 at km 50.58 providing full access to both sides consolidating the existing access at km 50.31 and km 50.95 on the western side.

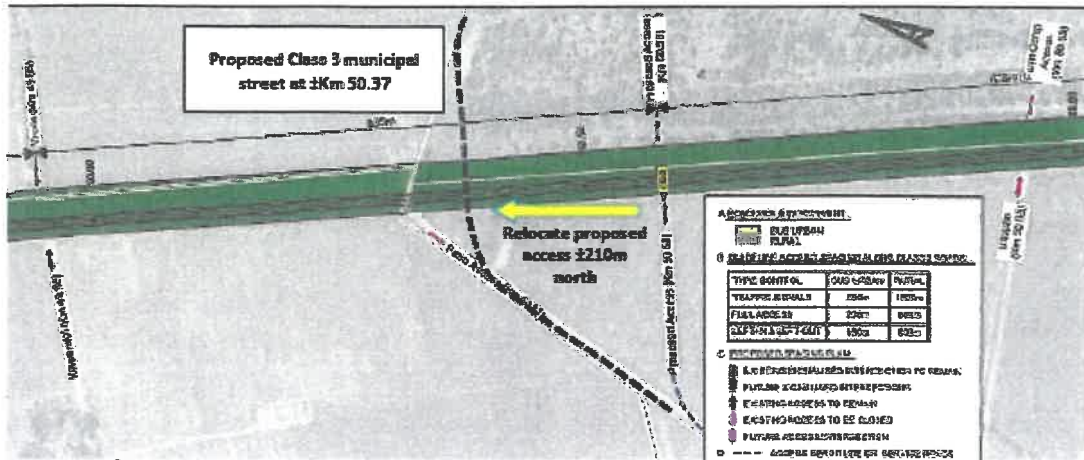


Figure 8: Extract ITS Arterial Management Plan (2012) – Proposed access to Farm Calcutta

In order for the proposed memorial park to not have direct access off MR174 and divide the site in two, it is proposed that the intersection be relocated  $\pm 210\text{m}$  north (km 50.37) allowing for a municipal street to be constructed along the northern boundary which would provide access to the development. The farm access to the west of MR174 at km 50.31 will have to be realigned at the same time as the proposed access is implemented at km 50.37.

It is proposed that the access road off MR174 should be a Class 3 municipal street which would serve possible future developments to the east. The proposed access to the cemetery is approximately 460m from MR174. This would ensure that any queuing that may occur at the entrance to the cemetery would not impact the two way stop controlled intersection on MR174.

There are no planned roads in the vicinity of the site that will impact the proposed Calcutta Memorial Park. The future dualling of Main Road 174 will result in the possible upgrading of the proposed access to a roundabout or signalised intersection. The layout allows for people to travel through the cemetery and park in allocated areas nearest to where they would need to be. Formal parking for busses is provided for at the entrance to the cemetery.

The findings and recommendations of the Traffic Impact can be summarised as follows:

- To allow for the development it is proposed that a municipal street be constructed along the northern boundary of the site. To achieve this, the 2012 AMP proposed future roundabout/intersection needs to be relocated.
- The impact of the relocation will have a limited impact on access spacing and still comply with the Access Management Guidelines.
- The intersection will require a right turn lane for traffic travelling north on MR174. A left turn taper is proposed on the northern leg. The realignment of the farm access to the west will have to coincide with the construction of the intersection.
- The report shown that the proposed development can be accommodated by the adjacent transport network provided the recommendations presented in the report are implemented.

- From a traffic engineering perspective, the application is supported.

Please refer to Annexure E for Traffic Impact Assessment.

## 7.3 Terrain characteristics

### 7.3.1 Physical aspects/topography

The proposed site to be developed slopes gently towards the south west and south east, but is generally flat with an open landscape. The slope is gentle in the north, steepening up closer to the river.



Figure 9: Topography

### 7.3.2 Soil formation and permeability

The site is underlain by a mantle of colluvial soils overlying the weathered shales of the Tygerberg Formation of the Malmesbury Group which is the older of the formations. The site is overlain in the north by a soil mantle comprising, from ground surface, cream brown loose to dense to very dense fine grained calcareous sand or sand with plant roots

over the top 0.4m to 0.7m. In the south, the clay was underlain by olive brown medium dense to dense intact fine to medium grained sand which was interpreted as residual sandstone. In the east, the site is overlain by light grey dense intact sand with tree roots over the top 0.40m (Gondwana Geotechnical Investigations report, 2018, copy attached as **Annexure F**). As there are no fault zones, seismic zones, dolomite or cast areas on the site, sinkholes and ground subsidence related to unstable geological conditions are unlikely.

The Cemetery site was rated by the Geotechnical Investigation in terms of the attribute rankings, obtaining a score of 75. This indicates that in terms of the Site Suitability Rate Index, the site is considered satisfactory for development as a cemetery.

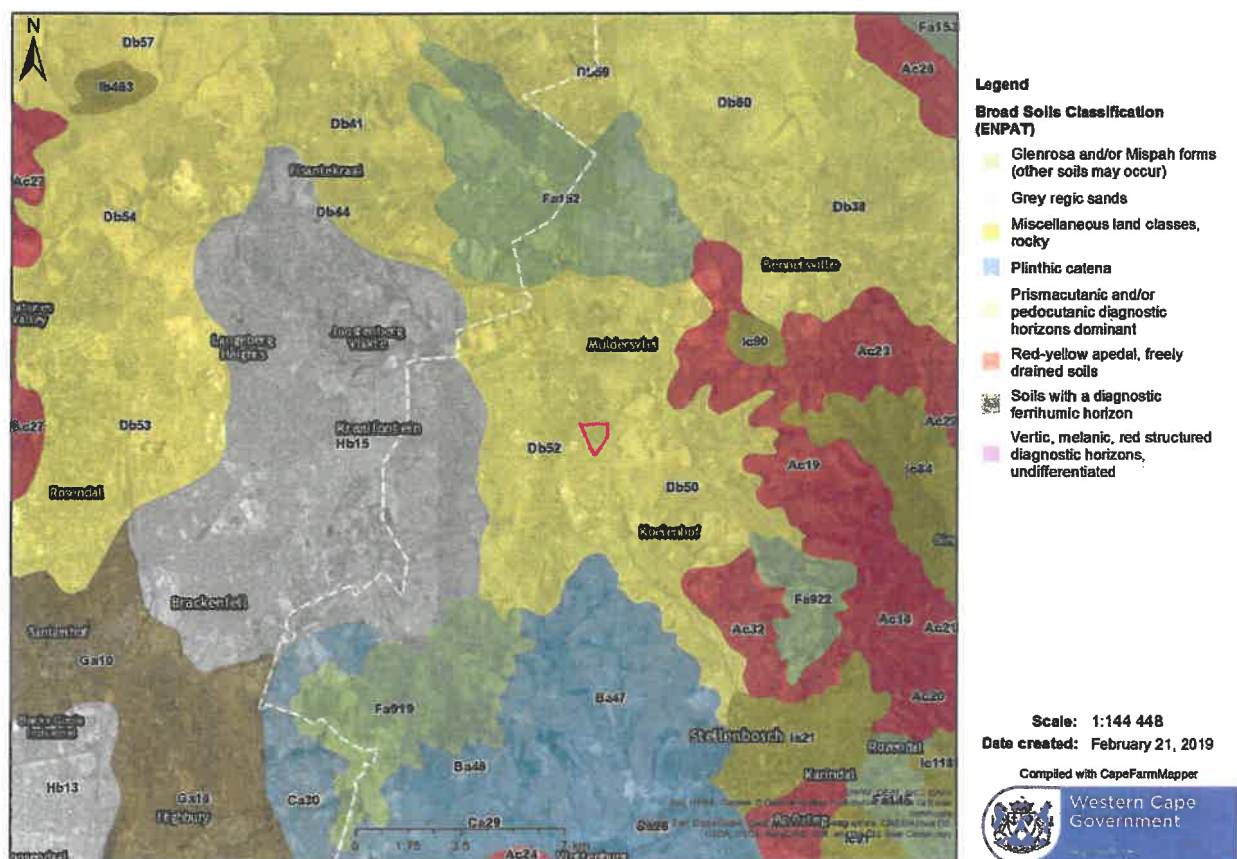


Figure 10: Geological setting of the proposed development site and surrounding area

### 7.3.3 Water use

Water wise plants will be promoted to prevent soil erosion and to introduce landscaping. The overall philosophy that will be followed for the development is to transport storm water from the hardened surfaces (roofs of buildings and roads) to an irrigation reservoir where storm water can be polished and used for irrigation of trees, shrubs etc. Storm water from outside the terrain for development will also be incorporated into the water reticulation system leading to the irrigation reservoir.

Due to the fact that no water network is available on site and that no potable water from the Municipality is available, it is proposed that a borehole be provided to ensure water for the buildings to be erected.

#### 7.4 Local and Micro environment

Due to the important role that cemeteries play in a community, it is imperative that cemeteries be located within an acceptable distance to the community it serves.

##### 7.4.1 Infrastructure (Services)

###### 7.4.1.1 Electricity

The electricity supply authority for the development is Eskom. The required bulk electrical infrastructure strengthening/upgrades will be investigated and infrastructure will be proposed. It is however envisaged that the provision of electricity from a solar system will be favoured. Provision of electricity by means of solar compared to the normal installation and maintenance cost of electricity from Eskom will be done. During the design phase, both options will be investigated and the most cost effective solution will be followed, taking into account safety and maintenance of the system.

###### 7.4.1.2 Storm water

The storm water will be incorporated into the existing storm water system. Storm water run-off must be controlled to ensure on site activities do not culminate in off site. It is proposed to transport storm water from the hardened surfaces (roofs of buildings and roads) to an storm water retention facility where storm water can be polished and used for irrigation of trees, shrubs etc. Storm water from outside the terrain for development will also be incorporated into the water reticulation system leading to the attenuation facility. Overflow from the attenuation facility could be taken to the stream on the western boundary. This is unlikely, as an additional borehole is planned to provide water for the development. Surface water from areas earmarked for graves and informal areas will be taken via swales or rock line channels to the storm water reticulation system in order to feed into the attenuation facility.

Subsurface drainage will have to be provided to minimise the potential negative effects of a possible high water table in the winter months. The wetland will be rehabilitated.

###### 7.4.1.3 Street layout

The street layout proposed for the facility will consist of an intersection with the R304, as indicated on the site development plan attached as Annexure D, with an access road towards the entrance of the cemetery facility. From the intersection, an access road will be provided to the entrance of the cemetery, leading to the entrance and parking area.



Internal roads will be provided which will give access to the memorial park, offices, workshop and staff accommodation. A combination of paved areas is proposed for esthetical purposes. The main access road can be provided with a tarred surface with barrier kerbs and a channel alongside for transportation of the storm water to the irrigation reservoir.

#### 7.4.1.4 Sewer reticulation

There are currently no existing sewer network services on the terrain or any municipal reticulation system close to the site. It is therefore proposed that a package plant be constructed on site which can treat the effluent from the offices/toilets/staff accommodation. It is also proposed that the sewer treatment occurs upstream of the irrigation reservoir which can then contribute to the capacity to irrigate the green areas.

A reticulation underground system will be provided, leading from wet areas to the treatment plant, via sewer pipes and manholes. It is foreseen that a network of 160mm piping will be adequate with smaller 110mm individual connections to different buildings.

#### 7.4.1.5 Water reticulation

No water network is available on site and no potable water is available from the Municipality. It is proposed that borehole(s) be provided to ensure water to the development. Investigations will be required to determine the position(s). Initial investigations indicated good quality of water, however, the yield of 1l/s could necessitate more than one borehole. From the boreholes, water will be pumped to the offices, toilets and accommodation via an underground pipe system.

It is foreseen that a network of Ø110 / Ø 160 mm main feed line be provided for the development.

#### 7.4.1.6 Telkom services

Telkom and other service providers will be approached with a layout of the development and will have the opportunity to provide a distribution system within the development. The necessary sleeves will be provided at street crossings.

Refer to Annexure G for copy of services report.

### 7.4.2 **Architecture and Future Heritage**

The cemetery site will be fenced and maintained as stipulated in the Regulations relating to Funeral Undertakers' Premises (Reg 237 dated 8 February 1985) promulgated in terms of Sections 33 and 39 of the Health Act, Act 63 of 1977. Built structures like a Columbarium with niche and wall of remembrance, ablution facilities, offices, workshop, maintenance shed, storage facility, staff accommodation and chapel will be erected.

The design and layout of the proposed development layout considered the following:

- Ensure a safe, accessible and aesthetically pleasing site for the burial of the dead.
- Keep maintenance low and thereby keep costs low.
- Use design elements such as meandering walkways through area, views and vistas, landscaped planting, open spaces, well designed entrances and fencing to create a sense of place and dignity.
- Ensure easy access for vehicles, digging machinery and pedestrians.
- Keep the design of the layout flexible.
- Keep major access roads to cemeteries in good condition.

### **7.4.3 Impact on the environment**

A Basic Assessment in terms of the applicable Environmental legislation is in process and running concurrently with the planning process. Refer to **Annexure R** for copy of report.

### **7.4.4 Social**

The proposed memorial park will provide the much needed burial space required. Community or social utilisation of the memorial park other than for burial/remembrance purposes is advocated through the rehabilitation of the Outspan area on the south western section of the proposed development site, as well as the rehabilitation of the seasonal stream.

As a memorial park is a place to celebrate life, it represents a social space reflecting the value a community attach to the memories of their family, friends and or colleagues. A memorial park will become such a social space.

## **8. SPECIALIST ASSESSMENTS**

Specialist consultants were appointed to inform the Planning- and Environmental processes. Below is a summary of findings:

### **8.1 Archaeological Impact Assessment**

#### **Specialist:**

Jonathan Kaplan (Agency for Cultural Resource Management)

#### **Results:**

The results of the study indicate that development of a new municipal cemetery on Farm No. 29 Calcutta will not have an impact of great significance on pre-colonial, archaeological heritage. Archaeological visibility was very low due to extremely dense vegetation cover. Indications are that the receiving environment is not a sensitive or threatened archaeological landscape. The final conclusion of the study indicates that there are no significant impacts to archaeological heritage that will need to be mitigated prior to the proposed development. It is recommended that the

site should be scanned for artefactual remains dating back to when an area of Calcutta Bos was used as an Outspan, once vegetation has been cleared and removed from the site. Refer to **Annexure H** for report.

## 8.2 Biodiversity Assessment

### Specialist:

Peet Botes ('EnviroAfrica)

### Results:

The property can be described as a Eucalyptus plantation (with *Acacia saligna* also prominent) and is densely covered by these alien plant species. Most of the area proposed for the development is within potential critical biodiversity-or ecological support areas, which includes:

- CBA 2– degraded areas but with potential for rehabilitation.
- ESA 2– ecological support areas (associated with watercourses or plantations)

A physical site inspection showed that the whole of the property has been degraded as a result of dense stands of the alien tree Eucalyptus, but with *Acacia saligna* also prominent. Very few remaining natural plant species was observed, but a small watercourse cross the property from north to south. Since the proposed development footprint will impact on potential CBA and ESA areas, the precautionary approach must be applied.

Cape Nature (Mr. Rhett Smart) comments; "This site does seem heavily infested with aliens from the road and would need ground-truthing to check if there is any natural vegetation in the understory. However based on inputs below there isn't really anything else left." Refer to **Annexure I** for report.

## 8.3 Botanical Statement

### Specialist:

Peet Botes ('EnviroAfrica)

### Results:

This study indicates that Calcutta is overgrown by a dense mix of alien invasive plant (AIP) species, dominated by Eucalyptus species and Port Jackson (*Acacia saligna*). No natural vegetation was encountered, apart from a few hardy remaining shrubs and sedges, which was mostly associated with the small seasonal stream. Apart from the dense stand of invasive species, the site also displayed a multitude of other disturbances, including sand mining activities, dumping and harvesting of fire wood (Eucalyptus) as well as individuals cutting fence poles. A few indigenous plant species was observed, scattered in between the stands of alien plant species. The site is clearly degraded to the point of being transformed. Very few indigenous plant species remains on site (covering less than 5% of the area) and they were all hardy shrubs or pioneer species. It is considered unlikely that the natural veld will ever be able to re-establish itself on the site. The small seasonal stream is similarly degraded, with almost no riparian vegetation remaining. This report indicates that, ideally one should try to rehabilitate this stream and re-establish natural riparian vegetation.

However, this will not happen under the current land use, but it is possible to make the stream a feature of the memorial park and to rehabilitate it to a more natural state. To conclude, the site currently has low biodiversity significance but can be rehabilitated. Refer to **Annexure J** for report.

#### **8.4 Freshwater Assessment**

**Specialist:**

Joshua Gericke (EnviroSwift)

**Results:**

Freshwater features within Farm 29 were identified and delineated. A mosaic of depression wetlands and two non-perennial drainage lines were identified. Given the high degree of transformation within the farm however, it is possible that the wetland boundaries determined may change after the alien invasive forests have been removed and hydrology has returned to more natural conditions. It is therefore proposed that it be made a condition of any approval granted based on the findings of this report that the site be revisited for verification of the wetland delineation during the wet season (Jul/August) after site clearing is completed, so that reports can be updated and plans adjusted to accommodate post clearing wetland boundaries. An impact assessment was conducted, and it was found that, after mitigation, all impact ratings were in the Low or Very Low category, with as many positive rating as negative. It is therefore the opinion of the specialist that the negative impacts are approximately balanced by the positive impacts. It is therefore recommended that Environmental and Water Use Authorisations be granted for this project. To conclude, if the layout avoids infilling of the wetlands, along with a 15m buffer for each, then the project would represent a significant net positive impact over present conditions. Refer to **Annexure K** for report.

#### **8.5 Geohydrological Assessment**

**Specialist:**

Charles Peek and Julian Conrad (GEOSS)

**Results:**

The site has a "medium" groundwater vulnerability rating, due to the argillaceous nature of the surficial cover. Calcutta is in close proximity to a number of groundwater users that depend on groundwater as a source. On the neighbouring property, approximately 200 m from the northern boundary, there are two boreholes with good groundwater quality. It is recommended that, should the site be considered viable from all other perspectives, then three to four exploration boreholes be drilled on site to bedrock to determine the groundwater level; aquifer thickness; nature of material of the surficial cover; and groundwater quality. These boreholes can then also be used as monitoring boreholes if the site becomes operational. Refer to **Annexure L** for report.

## 8.6 Geotechnical Investigation

### Specialist:

Colin Hartley (Gondwana Geo Solutions)

### Results:

The site is underlain by a soil mantle comprising, from ground surface, loose to dense sands of colluvial origin overlying sandy clay, gravelly sand, sand and clay horizons. The cemetery site was rated in terms of the attribute rankings and a score of 75 was obtained. This indicates that in terms of the Site Suitability Rating Index, the site is considered satisfactory for development as a cemetery. It is recommended that Gondwana Geo Solutions be appointed to carry out periodic inspections on the earthworks and foundation excavations during construction to confirm the recommendations given in this report. Refer to **Annexure F** for report.

## 8.7 Heritage Impact Assessment (HIA)

### Specialist:

Bruce Eitzen (New World Associates)

### Results:

The potential impact of the proposed cemetery site on the old Outspan is significant in that it is a wholesale change of land use from woodlot to cemetery. However, the landscape plan has sensitively, if not, fortuitously, allowed for the conservation of the southern Outspan site and surrounds in its overall framework. It would now be placed in the buffer informal parkland zone. It is recommended that the Outspan site in the south western corner of the property be set aside, with a buffer (radius of 50m) and designated as the Outspan site. This actual position should be confirmed if possible by further historical research and interviews with locals. Once all the facts about the Outspan have been determined, a specific plan for the historic Outspan site's development should be prepared including interpretive information and signage. Refer to **Annexure M** for report.

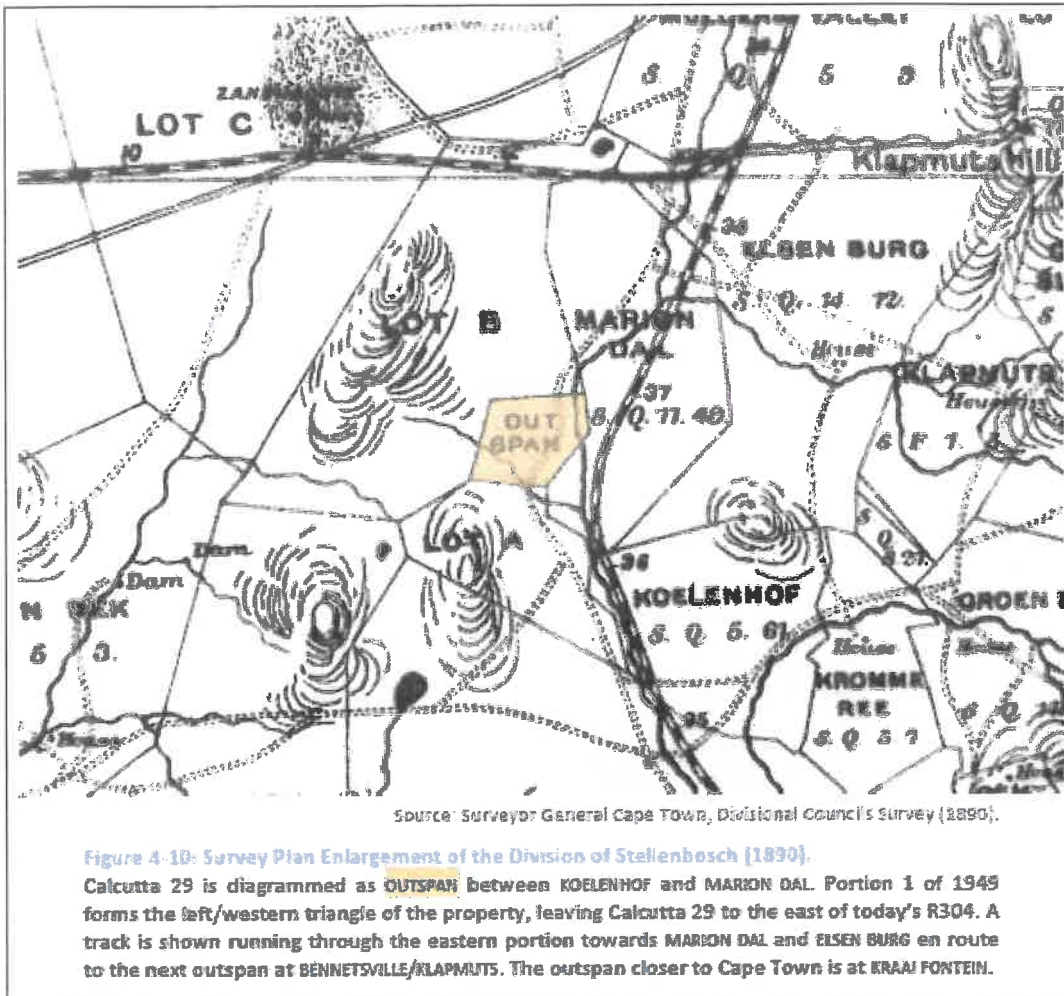


Figure 11: Outspan area as highlighted in HIA

## 8.8 Palaeontological Specialist Study

### Specialist:

Dr. John E. Almond (Natura Viva cc)

### Results:

Late Caenozoic superficial deposits (sandy soils, ferricrete, stream gravels) as well as the underlying, deeply-weathered bedrocks of Malmesbury Group meta sediments intruded by Cape Granite found in the Memorial Park study area are all of low palaeontological sensitivity. The proposed development is very unlikely to have significant impacts on palaeontological heritage. There are therefore no objections on palaeontological heritage grounds to authorisation of the proposed development. It is recommended that, pending the exposure of significant new fossils (e.g. mammalian bones and teeth) during construction, exemption from further specialist palaeontological studies and mitigation is granted for this development. Refer to **Annexure N** for report.

## 8.9 Visual Impact Assessment

### Specialist:

Bruce Eitzen (New World Associates)

**Results:**

The R304 is only moderately scenic, particularly southbound and runs adjacent to the site's west boundary. The flatness of the site and its dense gum plantation blocks views into the site whilst indicating its location generally in the open landscape of fields and vineyards. The proposed development will have a moderate impact on the landscape, causing some change to the visual environment. The development has moderate to high visual exposure, moderate visual absorption capacity, medium compatibility, and is moderately to highly visible (R304). The development's visual impact has site-related to local extent, long term duration, medium intensity, definite probability and medium significance on the landscape. Refer to **Annexure O** for report.

**Recommendations made to minimize visual and aesthetic impact:**

- Taller structures should be set back from the road.
- The landscape buffers along the edges are very important (should be well planted).
- Lighting should be carefully managed to prevent excessive lighting.
- Colouring of structures and fences should be subtle.
- Where possible, greenery should be maximized.
- The use of permeable paving is recommended.
- Protect natural vegetation
- Prevent pollution
- Monitor the landscape, soils and vegetation.

**8.10 Socio-economic Study****Specialist:**

Anelia Coetzee (LEAP)

**Results:**

There are 11 potential benefits and 3 potential negative impacts identified for the proposed development.

**The potential benefits include:**

- Increase in job and skill levels
- Creation of social space
- Continuation of social network
- Equality and exclusivity
- Employment equity of vulnerable groups
- Use of social amenities
- Positive change in sense of place

- Preservation of social history
- Access to leisure opportunities
- Access to natural resources
- Sales and GGP

The potential negative impacts:

- Crime
- Neglect; individual and family changes
- Dust and noise levels

Refer to **Annexure P** for report.

## 9. LAND USE PLANNING PRINCIPLES

The *Spatial Planning and Land Use Management Act (SPLUMA)*, Act 16 of 2013 and *Land Use Planning Act (LUPA)*, Act 3 of 2014 provides for spatial planning and land use management on national level. This act includes five development principles for spatial planning. This application supports these principles as follows:

**Spatial Justice:** The property in question will be put to better use to provide a needed social service to Stellenbosch Municipality and its inhabitants. The new regional site is highly accessible, and will the development create much needed grave space (social amenity need) as the current cemeteries are reaching capacity.

**Spatial Sustainability:** The proposed development promotes spatial compactness and sustainable resource use. The proposed rezoning will not affect any natural habitat, ecological corridors or high potential agricultural land. This proposed development attempts to ensure that citizen's needs are met in an affordable way and to promote viable cities.



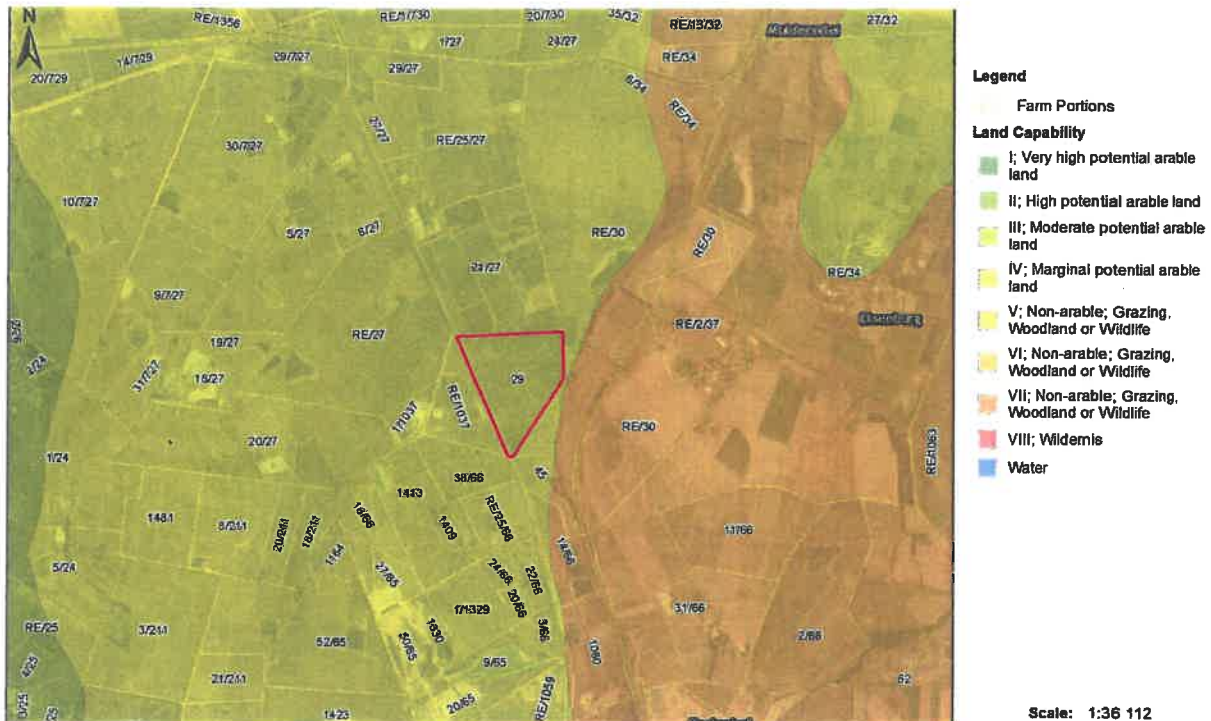


Figure 12: Agricultural capability

**Efficiency:** The proposed development will optimise the use of existing resources and infrastructure. Due to the important role that cemeteries play in a community, it is imperative that cemeteries be located within an acceptable distance to the community it serves.

**Spatial Resilience:** The proposed development does not limit future benefits that the properties may have.

**Good Administration:** The proposed application will be taken through the public process by Stellenbosch Municipality and CK Rumboll and Partners and all relevant departments will be contacted. The decision making process will be guided by statutory land use planning systems.

## 10. STELLENBOSCH SPATIAL DEVELOPMENT FRAMEWORK (SDF MAY 2018) AND INTEGRATED DEVELOPMENT PLAN 2017 -2022 (IDP)

### **SDF:**

The location of the farm Calcutta nr 29 is just north of the 1km urban boundary on the road to Cape Town and the N2. Nothing is planned outside Koelenhof around Farm Calcutta nr 29, leaving it rural-agriculture. None of the Koelenhof proposals will have an effect on the proposed site/development.

The dire need for burial ground is Ad hoc. No provision for cemetery premises, as approved by the Stellenbosch Council is contained in the SDF for the following reason / s. Many sites have been investigated and the placing of cemeteries are associated with public participation, environmental considerations and the like that make it difficult to

address on SDF level. In the period from 2015 to end 2017, utilising, as a starting point, the Cemetery Feasibility Study as prepared by Dennis Moss Partnership, as well as the 9 potential sites approved by Stellenbosch Municipal Council, over fifty potential proposed development sites were identified and investigated.

By mid 2017, through a systematic assessment of various criteria, five potential sites for the entire Municipal area were identified as best suited for the proposed development of regional public cemeteries and memorial parks. These 5 sites were further evaluated by a team of specialists in terms of their suitability leaving only two suitable sites, Farm Calcutta nr 29 and Farm Louw's Bos nr 502.

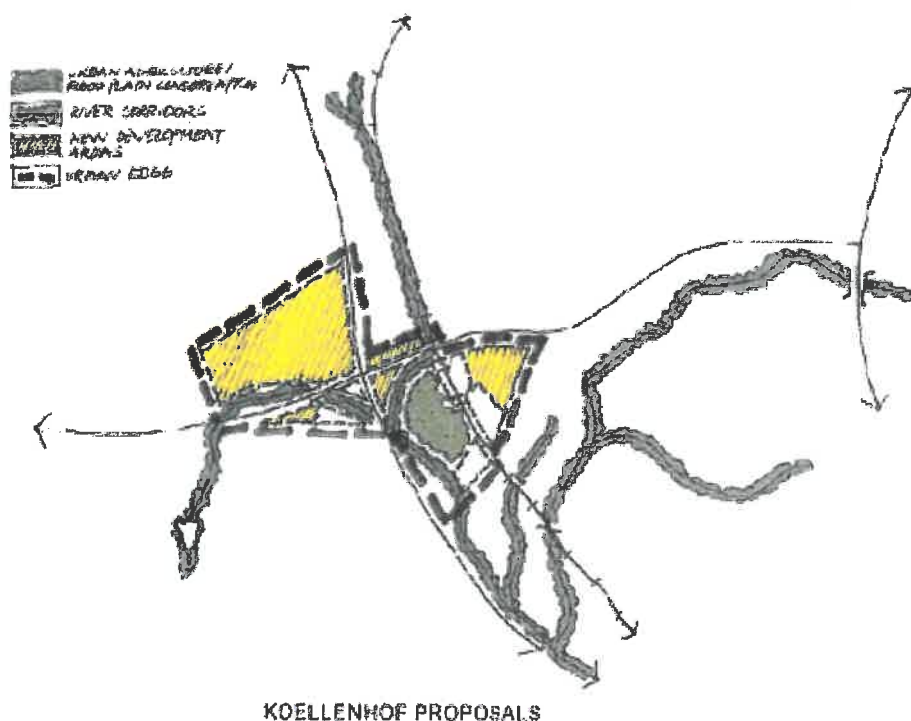


Figure 13: SDF extract; 2018

Although the development is not compliant with any development proposals set out for Koelenhof in the SDF, it is not inconsistent as the proposed development is adhering to one of the principals that guide development in the Stellenbosch area namely optimal land use.

#### IDP:

#### CHAPTER 7 – Strategy

**The environment and heritage:** We know that our environment is increasingly under threat globally, in different ways. We also see it in the greater Stellenbosch area. Development has meant the loss of many hectares of

valuable agricultural land, and some pristine nature areas have been scarred or have become less accessible for everyone to enjoy.

The proposed memorial park makes provision for parkland, eco-rehabilitation, environmental education and heritage interpretation. This property is currently polluted with dense alien vegetation which is not accessible to the public. The proposed memorial park will provide the necessary removal of alien vegetation and rehabilitation of the natural vegetation and ecosystem. This land will be utilized to provide public access to parkland and nature areas and not only be used for cemetery purposes.

We have undermined a valuable biodiversity resource, not only as a context for tourism, but also as cultural heritage, a sacred space for healing, and the provider of valuable ecosystem services such as clean water, clean air, and erosion prevention. Poorly controlled sub-urbanisation and land use change on farms have resulted in non-productive use of land and the displacement of work and people.

The proposed memorial park makes provision for the protection of freshwater resources. The fresh water stream and wetland area on the property will be protected by a 32m buffer on each side. The removal of alien trees will reduce the stress placed on the water source and could help rehabilitate valuable fresh water.

## CHAPTER 8 Strategy Unpacked

### STRATEGIC FOCUS AREA 4: DIGNIFIED LIVING

STRATEGIC FOCUS AREA 4:	4.1 To develop and maintain sustainable human settlements that will provide in the diverse range of housing needs	1. Develop and implement a housing pipeline. 2. Implement upgrading of informal settlements program 3. Integrated Residential development program. 4. Social Housing program 5. Community Residential Units.
DIGNIFIED LIVING	4.2 To develop and implement a social infrastructure master plan for the upgrading and maintenance of social facilities in all wards.	1. Identify and map all current social infrastructure. 2. Identify and upgrade facilities for multi-purpose usage. 3. Identify areas to establish new facilities for sport and recreation facilities.
	4.3 To involve and build the capacity of stakeholders in the planning and management (governance) of the areas where they live. (Promote participatory planning and integrated implementation)	1. Conduct community meetings, project steering committee meetings, beneficiary community meetings, and housing consumer education sessions.

Project Name	Department	Strategic Objectives	Proposed Budget 2017/2018	Proposed Budget 2018/2019	Proposed Budget 2019/2020
<b>COMMUNITY AND PROTECTION SERVICES</b>					
Extension of Cemetery Infrastructure	Cemeteries	Dignified Living	500,000	-	-
Cemeteries: Purchase of Specialised Equipment	Cemeteries	Dignified Living	20,000	20,000	-

## 11. MOTIVATION

- Due to the important role that cemeteries play in a community, it is imperative that cemeteries be located within an acceptable distance to the community it serves.
- The cemetery establishment aims to cater for the cultural needs within the municipal area.
- Local cemeteries are fast reaching capacity, with only a few graves that are left.
- The portion of land where the Memorial park is proposed (farm Calcutta) is owned by Stellenbosch Municipality.
- Taking into account the surrounding agricultural area, this proposed area serves to be the best option as it is not utilised for agricultural purposes with the site being infested with Blue Gum- and Port Jackson trees.
- The concept involves establishing a memorial park set in a landscaped environment providing a peaceful, tranquil, dignified and safe environment in which families can put to rest their loved ones, rather than just a cemetery.
- A memorial park will require landscaping, manicuring and maintaining. Sustainable employment opportunities will be created.
- A memorial park provides for all income groups, cultures and religions.
- Memorial parks are also designed to enhance recreation and leisure opportunities like hiking and biking trails.
- The proposed memorial park will have no impact on people's access to natural resources i.e. wood, water and medicinal plants.
- Sales related to the land will contribute to the economy of the Municipality.
- The proposed memorial park will provide the much needed burial space required.
- The proposed memorial park serves as a greener approach to the establishment of traditional burial grounds, whilst promoting an alternate, less land demanding option for burial and remembrance.
- The proposed cemetery will take the form of a memorial park which would allow significant leeway for walkways and landscaping.
- No viable agricultural land will be lost.

## 12. Conclusion

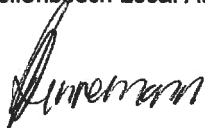
South Africa is home to a rich variety of cultural and religious belief systems, in which cemeteries play a crucial role in people's lives. This is visible on important holidays such as Easter and Christmas Day when families and friends visit cemeteries, and gather by gravesites to remember and pray for their dead.

Due to their land-consuming nature, cemeteries occupy significant areas. Cemeteries are under immense pressure from urban growth and development. Like most basic services, they are susceptible to impacts of rapid urbanisation, increasing population growth, environmental changes and illnesses such as HIV/AIDS and TB.

Generally, people are uncomfortable with considering the realities of death. Any discussion concerned with the planning, design and management of cemeteries is bound to be sensitive. Eventually change will have to be effected, given the number of pressures facing government. These concern the diminishing availability of suitable land for burial, fiscal constraints, environmental concerns and the reluctance to move away from conventional planning practices.

In addition to preserving and promoting the introduction of indigenous vegetation in the area, the proposed public cemetery and memorial park will preserve the cultural heritage of the regions Outspan site and provide employment for local individuals, whilst meeting the need for the essential services of a contextualised public cemetery and memorial park.

This office supports the proposed development of the cemetery and memorial park on the proposed site and request Stellenbosch Local Authority to consider the application favourably.



Jofandie Linnemann

For CK Rumboll and Partners

**ANNEXURE D**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COPY OF TITLE DEED/CONVEYANCER CERTIFICATE**

117

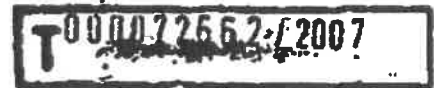


Opgestel deur my

TRANSPORTBESORGER

L. PECORARO

**AANSOEK IN TERME VAN ARTIKEL 16 EN SERTIFIKAAT KRAGTENS  
ARTIKEL 31(4)(a) VAN WET NR 47 VAN 1937**



Ek, die ondergetekende,

**DAVID PETER DANIELS** in my hoedanigheid as **MUNISIPALE BESTUURDER** van die **MUNISIPALITEIT STELLENBOSCH**, behoorlik daartoe gemagtig

1. Doen hiermee aansoek in terme van Artikel 16 van Wet No 47 van 1937 vir die endossering van die ondergenoemde Titelaakte waarkragtens die volgende eiendom besit word, naamlik:

**RESTANT VAN DIE PLAAS CALCUTTABOS No 29**, geleë in die Munisipaliteit en Afdeling **STELLENBOSCH**, Provinsie **WES-KAAP**

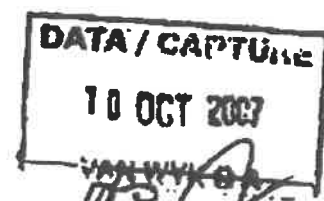
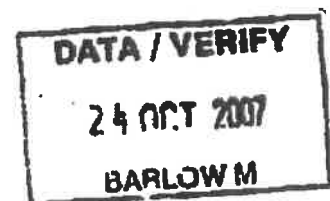
**GROOT: 1,5871** (Een Komma Vyf Agt Sewe Een) Hektaar

**GEHOU** kragtens Kroongrondbrief No 163/1939

om aan te toon dat die eiendom vestig in

**MUNISIPALITEIT STELLENBOSCH**

Daargestel kragtens Provinsiale Kennisgewing Nr 489  
Afgekondig in Provinsiale Koerant Nr 5590  
Gedateer 22 September 2000



2. Certifiseer hiermee dat daar aan die bepalinge van alle wette vordoe. is in verband met die verandering van eiendomsreg in die genoemde eiendom en soos bepaal in Artikel 31(4)(a) van Wet No 47 van 1937.

GEDATFER te STELLENBOSCH op 8 Augustus 2007.

AS GETUIES:

1.  \_\_\_\_\_  \_\_\_\_\_  
D P DANIELS
2.  \_\_\_\_\_



G.P.S.1480-1939-1,000.

REGISTERED ON 25 AUG. 1939  
 DIE REGERING VAN SUID-AFRIKA  
 DIE REGISTRAR VAN PLASSE  
 Ek..... Fel..... Ek..... Fel.....  
 REGISTERAR VAN DEEDS



CROWN GRANT No. 1639

*Handwritten notes:*  
 A Certificate of Rights to minerals No 100/1934 has been issued in terms of Section 10(1) of 1937 Act in favour of the Government of the Union of S.A. in respect of the mineral rights reserved hereunder.  
 Deeds Registrar  
 Cape Town

ASST. REGISTRAR OF DEEDS

25 AUG. 1939

REGISTERED IN M.O.T. IN THE 10-KOMS REKRYWE WOODS  
 AS DESCRIBED AS, AND MUST IN FUTURE  
 BE DESCRIBED AS  
 Reference No. 55  
 Deeds No. 1639  
 Deeds No. 1639

AKTERISERD  
 DEEDS REGISTRAR  
 KAAPSTAD  
 OORP TOWN  
 157/100  
 DEEDS REGISTRAR  
 CAPE TOWN

In the name and on behalf of His Majesty GEORGE THE SIXTH by the Grace of God, of Great Britain, Ireland and the British Dominions beyond the Seas, King, Defender of the Faith, Emperor of India.

WHEREAS

the grant of a certain piece of land called  
 C A L C U T T A

situate in the Division of Stellenbosch in the Province of the Cape of Good Hope, has been authorized under a Resolution adopted by the House of Assembly on the 29th March, 1939, and concurred in by the Senate on the 2nd May, 1939, by the Government of the Union of South Africa, under and by virtue of Executive Council Minute No. 1206 dated the 23rd May, 1939, in favour of  
 THE DIVISIONAL COUNCIL OF STELLENBOSCH.

AND NOW, THEREFORE, THESE PRESENTS WITNESS that there is hereby granted, ceded, and transferred by the Governor-General of the Union of South Africa unto the said  
 THE DIVISIONAL COUNCIL OF STELLENBOSCH,  
 his successors-in-title or assigns, with full power and authority henceforth to possess the

same ....

*Handwritten notes:*  
 27.03.39  
 D. de Groot

same in perpetuity, the said piece of land called  
 C A L C U T T A,  
 situate in the Division of Stellenbosch, measuring  
 seventy-four (74) morgen one hundred and eighty-nine  
 (189) square roods, and represented and described  
 in the diagram (No. B.167/1925) hereunto annexed, framed  
 by Surveyor W.G. Krige, dated April, 1925, subject,  
 however, to the following condition :-

Subject to the provisions of the  
 Reserved Minerals Development Act,  
 1926, and of the Precious Stones  
 Act, 1927, all rights to all  
 minerals, mineral products, mineral  
 oils, coal, base or precious metals  
 or precious stones in or under the  
 land are reserved to the Government.

THUS DONE AND SIGNED by the  
 Provincial Representative, Department of Lands, at  
 Cape Town, on the ..... 12<sup>th</sup> ..... day of  
 .. August ....., 1939, duly authorized thereto

in that behalf by the Governor-General, in terms  
 of the Crown Land Disposal (Execution of Deeds)  
 Act, 1911.

*J. M. G. ...*

.....  
 PROVINCIAL REPRESENTATIVE.  
 DEPARTMENT OF LANDS.

By Notarial Deed No. 3744/1939, IS ...  
 granted to ...  
 over the ...  
 Cape Town.

**ANNEXURE E**


**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**


**PUBLIC PARTICIPATION PROCESS**



## PLANNING & ECONOMIC DEVELOPMENT

PORTFOLIO OF EVIDENCE Applicant advertised CHECKLIST				Date	15 November 2019	
Erf/Erven Farm no	29 (Calcutta)	Portion(s) if farm		Allotment Area	Stellenbosch	
Owner/Applicant	CK Rumboll & Partners		LU/number	9404		
INDICATE WHICH OF THE FOLLOWING DOCUMENTATION (WHERE APPLICABLE) IS ATTACHED TO THE PORTFOLIO OF EVIDENCE				OWNER/APPLICANT TO INDICATE		ADMIN OFFICER/PLANNER VERIFY
				YES	NO	<input checked="" type="checkbox"/>
<b>Affidavit (TEMPLATE ATTACHED)</b>						
1. Is the affidavit signed by a Commissioner of Oaths				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
2. Does the affidavit confirm that the advertising was undertaken in accordance with the said prescriptions?				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
3. Does the affidavit confirm that the notice was placed and kept on site for the duration of the advertising period (from which date to which date)?				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<b>Proof of publication</b>						
4. In <b>one</b> local newspaper in <b>two official languages (or in those cases where Council has indicated two local newspapers)</b>				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
5. Extract from the newspaper attached (date of publication visible)				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
6. Does the wording fully address the description of the application?				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
7. <u>If no, define differences :</u>						
8. Advertising period	From	12 September 2019	To	14 October 2019		
9. Does the Advertising period comply with the required 30 days?				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
10. Was Council informed of the commencement date and closure date?				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
<b>The registered slips in respect of all the registered letters addressed to</b>						
11. A copy of the registered letter addressed to the affected parties				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
12. Are the dates concurring				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
13. A copy of the registered letter addressed to the external departments (where required)				N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
14. Affected interested and affected parties (registered property owners) (original registered slips)				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
15. Community organisations (original registered slips)				<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
16. Ward Councillor (original registered slip)					<input checked="" type="checkbox"/>	
17. External Departments (where required) (original registered slip)				N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
18. Unclaimed registered mail				N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

19. If no to any of the above, define differences : Not instructed by Stellenbosch Municipality to notify Ward Councillor			
20. Were the external departments granted 60 days for comment?	✓		✓
<b>Notices placed on the property</b>			
21. Were the notices placed on the property on the same day as the notice in press?	✓		✓
22. Have photos been attached? (one close up and one from across the street)	✓		✓
23. Was the notice clearly visible on site?	✓		✓
24. Were the notices kept on site for the duration of the advertising period?	✓		✓
<b>Objections/Comments</b>			
25. From organs of state/external departments must be on a formal letterhead?	✓		✓
26. All objections/comments received attached?	✓		✓
27. All emails sent or received in respect of this application attached?	✓		✓
28. Applicant's comments on the objections attached?	✓		✓
<b>SIGNED BY APPLICANT/OWNER</b>			

<i>For office use only</i>	
<b>SIGNED BY ADMINISTRATIVE OFFICER</b>	
<b>VERIFIED &amp; SIGNED BY TOWN PLANNER</b>	
<b>DATE VERIFIED</b>	

## SWORN AFFIDAVIT

I, the undersigned [Full Name (s) and Surname]: Jolandie Linnemann

Identity Number: 8004160051086

in my capacity as (owner or authorised person through power of attorney):

by Mr. Piet Smit (Stellenbosch Municipality)

do hereby declare under oath that:

1. The application for:

For Rezoning: Farm Calcutta NR 29, Administrative Division, Stellenbosch

on Erf/ Farm Number: Calcutta Nr. 29, Stellenbosch.

Was advertised in at least two of the official languages of the Province in the following newspaper(s)<sup>i</sup>:

(a) Eikestad Nuus (b) \_\_\_\_\_

From 12 September 2019 to 14 October 2019.

2. The public notices were prominently displayed and maintained in a legible condition for a continuous period of thirty (30) days from the date of the advertisement as indicated in Section (2) above<sup>ii</sup>;
3. A notice containing the requirements as set out in the Stellenbosch Land Use Planning By-Law (2015), was posted per registered mail<sup>iii</sup> to all adjoining property owners/occupants/ interested and affected parties, during the same date of the advertising period as specified in Section (2) above;
4. Furthermore, a notice of the application was sent to the relevant Intergovernmental State Departments, per registered mail<sup>iv</sup>, commencing the same date as in Section (2) above with an additional 30 days (minimum 60 days) for comment;
5. That all comments and objections to the application concerned were forwarded to Stellenbosch Municipality as contemplated in sections 1 – 4 above.

The Deponent acknowledges that he / she knows and understands the contents of this Affidavit.

Signature: J Linnemann

Signed at: Malmesbury

On this: 14 day of: Nov. 2019.

At: 3 Hereford Street, Malmesbury

Commissioner of Oath's Stamp & Signature

[Signature] (PLS 1223)

Commissioner of Oaths/Kommissaris van Ede  
Professional Land Surveyor/Professionele Landmeta  
C K Rumboll & Partners, Box 211, Malmesbury, 7300

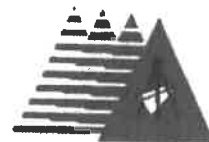
<sup>i</sup> Must conform to Section 47 of the Stellenbosch Municipality Land Use Planning By-law (2015) [THE BY-LAW]– attach copy of advert (s)

<sup>ii</sup> Site Displays must conform to Section 48 (2)(a) of the By-law – attach photos

<sup>iii</sup> Attach original registration post slips and copies of letters that were distributed containing the required information as per Section 47 of the By-law

<sup>iv</sup> Attach original registration post slips and copies of letters that were distributed containing the required information as per Section 47 of the By-law

# CK RUMBOLL & VENNOTE / PARTNERS



PROFESIONELE LANDMETERS - ENGINEERING AND MINE SURVEYORS - STADS- EN STREEKSBEPLANNERS - SECTIONAL TITLE CONSULTANTS

12/09/2019

OUR REF: STEL/9494/JL  
YOUR REF: Farm 29, Stellenbosch Division

**PER E-MAIL AND REGISTERED POST**

The Municipal Manager  
Stellenbosch Municipality  
Privatebag X17  
**STELLENBOSCH**  
7599

Sir/Madam

**PROPOSED REZONING OF FARM CALCUTTA NR 29, DIVISION STELLENBOSCH**

With reference to the above application and your letter dated the 23<sup>rd</sup> of August 2019 we hereby confirm commencement of public participation.

- Notice in press, site notice and registered letters to Interested and Affected Parties = 30 days commenting period.  
Commencement date: 12 September 2019  
Closure date: 14 October 2019
- Registered letters to external Departments = 60 days commenting period  
Commencement date: 13 September 2019  
Closure date: 12 November 2019

We trust you find the abovementioned in order. Necessary proof in the form of portfolio of evidence will be provided at the end of the public participation period. Please do not hesitate to contact this office should any additional information be required.

Kind regards

Jolandie Linnemann  
For: CK RUMBOLL and PARTNERS

**VENNOTE / PARTNERS:**

IHJ Rumboll PrL (SA), BSc (Surv), M.I.P.L.S., AP Steyl PrL (SA), BSc (Surv), M.I.P.L.S.

ADDRESS/ ADRES: [jolandie@rumboll.co.za](mailto:jolandie@rumboll.co.za) / PO Box 211 / Rainierstr 16, Malmesbury, 7299  
MALMESBURY (T) 022 482 1845 (F) 022 487 1661

Stellenbosch Interest Group  
 PO Box 2217  
**DENNESIG**  
 7601

INSURED PARCEL  
 PA533481825ZA  
 A BOOK COPY

Stellenbosch Agricultural Society  
 PO Box 204  
**STELLENBOSCH**  
 7599

INSURED PARCEL  
 PA533481839ZA  
 A BOOK COPY

Stellenbosch Heritage Foundation  
 PO Box 3003  
**MATIELAND**  
 7602

INSURED PARCEL  
 PA533481842ZA  
 A BOOK COPY

<b>REGISTERED LETTER</b> <b>GEREGISTREERDE BRIEF</b> (with an insurance option/met 'n versekeringsopsie)		 <b>Post Office</b>
<b>Full tracking and tracing/Volledige volg en spoor</b> Addressed to/Adresseer aan Kuntall 31 Hartjies <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		Postage paid R _____ Service fee/Diensgeld R _____ Insurance/Versekering R _____ <b>Total/Totaal R</b> _____
The value of the contents of this letter is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100.00. No compensation is payable without documentary proof. Optional insurance up to R2000.00 is available and applies to domestic registered letters only. Die waarde van die inhoud van hierdie brief is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100.00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering tot R2 000.00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.		Insured value of contents Versekerde waarde van inhoud R _____ <b>Enquiries/Navrae</b> <b>Toll-free number</b> <b>Tolvry nommer</b> <b>0800 111 502</b> <b>Affix Track and Trace</b> <b>customer copy</b> <b>Plate Volg-en-Spoor-</b> <b>kliëntafskrif</b>
Initial accepting officer  Paraaf van aanvaarder beampte		Malmesbury 7399 <b>Post Office</b> 2 SEP 2010 <b>Folio No: 1</b> Datumstempel



KOELENHOF WYNKELDER (PTY LTD)  
POSBUS 1  
KOELENHOF  
7605

INSURED PARCEL  
PA533481887ZA  
A BOOK COPY

SKY ONE ORCHID GARDEN CC  
PO BOX 1537  
KRAAIFONTEIN  
7569

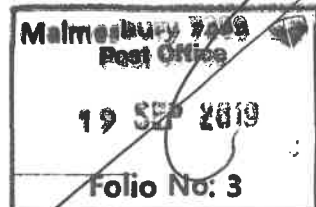
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PA533481913ZA  
A BOOK COPY

ENZA ZADEN SOUTH AFRICA (PTY) LTD  
PORTION 26 FARM 27  
R304  
KOELENHOF  
7605

INSURED PARCEL  
PA533481927ZA  
A BOOK COPY

FAIRFIELD PLACE (EDMS) BPK  
BISHOPSSINGEL 23  
DURBANVILLE  
7550

INSURED PARCEL  
PA533481895ZA  
A BOOK COPY



**DUPLenia PLASE EDMS BPK  
VREDE  
POSBUS 7271  
STELLENBOSCH  
7599**

INSURED PARCEL  
PA533481992ZA  
A BOOK COPY

**UNIVERSITEIT VAN STELLENBOSCH  
POSBUS 61  
ELSENBURG  
7607**

INSURED PARCEL  
PA533481958ZA  
A BOOK COPY

**Name: SIMONSIG LANDGOED PTY LTD  
DE HOOP  
POSBUS 6  
KOELENHOF  
7605**

INSURED PARCEL  
PA533481944ZA  
A BOOK COPY

**Name: OBLATE SISTERS OF STAINT  
FRANCIS DE SA  
ST. VINCENTS CONVENT  
PO BOX 28  
KOELENHOF  
7605**

INSURED PARCEL  
PA533481935ZA  
A BOOK COPY



KILLARNEY BRICKFIELDS PTY LTD  
FACTORY NO 5  
PO BOX 172  
**SOMERSET WEST**  
7129

INSURED PARCEL  
PA533482009ZA  
A BOOK COPY

V H HOLDING B V  
P/A MNR PJ BESTBIER  
POSBUS 12044  
**DIE BOORD**  
7313

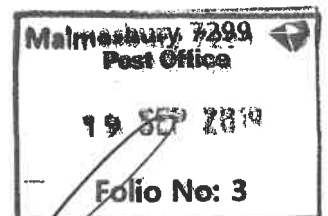
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BRIGANDORRA PTY LTD  
FARM DAHEIM  
PO BOX 59  
**KOELENHOF**  
7605

INSURED PARCEL  
PA533482043ZA  
A BOOK COPY

KOLENBERG PTY LTD  
CHICKWICK  
PO BOX 244  
**KOELENHOF**  
7605

INSURED PARCEL  
PA533482057ZA  
A BOOK COPY



MISTA MOTT INV PTY LTD  
PRIVATE BAG X5038  
STELLENBOSCH  
7599

INSURED PARCEL  
PA533482026ZA  
A BOOK COPY

RAOUL FONTANA TRUST  
150 MACLEAN STREET  
UMKOMAAS  
4170

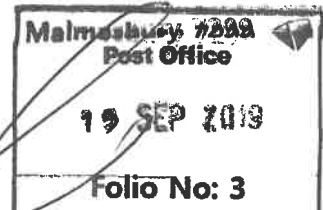
INSURED PARCEL  
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SAN MICHELE FARM PTY LTD  
VREDE  
PO BOX 7271  
STELLENBOSCH  
7599

INSURED PARCEL  
PA533481975ZA  
A BOOK COPY

KOELENBOSCH PLASE (EDMS) BPK  
POSBUS 244  
KOELENHOF  
7605

INSURED PARCEL  
PA533482012ZA  
A BOOK COPY



SUNDOWNERS BY STELLENBOSCH CC  
PO BOX 12  
KOELENHOF  
7605

INSURED PARCEL  
PA533482176ZA  
A BOOK COPY

BANISI INVESTMENTS (PTY) LTD  
C/O A BASCHIERA  
PO BOX 482  
STELLENBOSCH  
7599

INSURED PARCEL  
PA533482445ZA  
A BOOK COPY

S BASCHIERA  
POSBUS 127  
KOELENHOF  
7605

INSURED PARCEL  
PA533482162ZA  
A BOOK COPY

BLUE RIDGE VINEYARDS PTY LTD  
PO BOX 66  
KOELENHOF  
7605

INSURED PARCEL  
PA533482105ZA  
A BOOK COPY

Malmesbury 7200  
Post Office

19 SEP 2019

Folio No: 3

**STROBE PROPERTIES (PTY) LTD**  
**PO BOX 10232**  
**CENTURION**  
**0046**

**INSURED PARCEL**  
**PA533482091ZA**  
**A BOOK COPY**

**ASTRAL OPERATIONS LIMITED**  
**C/O COUNTRY FAIR FOODS**  
**PO BOS 94**  
**EPPINDUST**  
**7475**

**INSURED PARCEL**  
**PA533482088ZA**  
**A BOOK COPY**

**VREDENDAL KWEKERY TRUST**  
**PO BOX 1400**  
**KRAAIFONTEIN**  
**7569**

**INSURED PARCEL**  
**PA533482074ZA**  
**A BOOK COPY**

**SALVATION ARMY**  
**PO BOX 5**  
**ELSENBURG**  
**7607**

**INSURED PARCEL**  
**PA533482065ZA**  
**A BOOK COPY**

**Malmesbury 7268**  
**Post Office**  
**19 SEP 2019**  
**Folio No: 3**

SALVATION ARMY PROP CO  
 THE SUPERINTENDENT  
 PO BOX 5  
**ELSENBURG**  
 7607

INSURED PARCEL  
 PA533482410ZA  
 A BOOK COPY

TRANSNET SOC LTD  
 TRANSNET FREIGHT RAIL  
 PO BOX 1831  
**BELLVILLE**  
 7535

INSURED PARCEL  
 PA533482114ZA  
 A BOOK COPY

BL WILLIAMS CONSTRUCTION COMPANY (PTY)  
 POSBUS 249  
**STELLENBOSCH**  
 7599

INSURED PARCEL  
 PA533482128ZA  
 A BOOK COPY

KOELENHOF PLASE EDMS BPK  
 POSBUS 3  
**KOELENHOF**  
 7605

INSURED PARCEL  
 PA533481989ZA  
 A BOOK COPY

Malmesbury 7299  
 Post Office  
 19 SEP 2014  
 Folio No: 3

## Local karate kids graded for black belts in Tokyo, Japan

Rané Geldenhuys (16), a learner from Stellenbosch High School, travelled to Tokyo, Japan, along with Corné Voltschenk (15) from Paul Roos High School in July to be graded at the Gokur-Kai Hombu Dojo with the head of Gokur-Kai International, Saito Shihan Goshi Yamaguchi. After ten years of karate and a year of intensive training and preparation for their black belts, the two successfully achieved their Shodan (First black belt) grades. With Rena (middle) are (from left) sensei Charl Roux, hanshi Peter Brandon, shihan Francois du Plessis and sensei Tredeux Nigrihi.

## NOTICE OF LAND DEVELOPMENT APPLICATION IN THE STELLENBOSCH MUNICIPAL AREA

### APPLICATION FOR REZONING: FARM CALCUTTA NR 29, ADMINISTRATIVE DIVISION, STELLENBOSCH

**Applicant:** CK Rumboll and Partners  
**Owner:** Stellenbosch Municipality  
**Reference number:** LU/94/04  
**Property Description:** Farm 29, Stellenbosch Division  
**Physical Address:** Farm Calcutta nr. 29, Farm Calcutta, adjacent the R304, Stellenbosch

**Detailed description of proposal:** The matter for consideration is an application (in terms of Section 15(2) (a) of the Stellenbosch Municipal Land Use Planning By-Law) for the rezoning of Farm 29 from Agricultural Zone I to Open Space Zone II to allow for the establishment of a Memorial Park.

Notice is hereby given in terms of the Stellenbosch Municipal Land Use Planning By-law that the above mentioned application has been received and is available for inspection during weekdays between 08:30 and 13:30 at the Planning Advice Centre at Stellenbosch Municipality, Plain Street, Stellenbosch. Any written comments/objections, with full reasons therefore, may be addressed in terms of section 50 of the said legislation to the applicant in one of the following manners:

**APPLICANT**

*Registered mail or normal mail*

CK Rumboll and Partners, PO Box 211, Malmesbury, 7299. Attention: Jolandie Linnemann

*Or faxed to*

022 487 1861

*Or hand delivered to*

CK Rumboll and Partners, 16 Rainier Street, Malmesbury, 7300. Attention: Jolandie Linnemann

*Or e-mailed to*

jolandie@rumboll.co.za

All comments, quoting the application number, reference number, your name, address or contact details, your interest in the application and reasons for comments should be received by the above party on or before 30 days from the date of publication of this notice. Telephonic enquiries can be made to the applicant, CK Rumboll and Partners, Jolandie Linnemann at (022 482 1845). Any comment/objection received after aforementioned closing date will be regarded invalid. Any person who cannot write will be assisted by a Municipal official by transcribing their comments.

Afrikaans in skoolverband uit te lig. "Die doel is om die skoolomgewing mooi en inspirerende te maak en kinders se verbeelding verke te gee en hulle sodoende aan te moedig om Afrikaans met passie en oorgawe te geniet en te gebruik."

Prof. Niel Krige, voorsitter van die Het Jan Marais Nationale Fonds, wat ook by die muurprojek betrokke is, het die belangrikheid van moedertaalonderrig en veelaligheid

bet. v. verduurde... beter in die meeste... By dié geleentheid het... rymkletsers en Pasella-aan... OxiJin, 'n paar gedigte oge... deel van sy agtergrond met die leerders gedeel.

Leerders het verskeie-opvoerings gedoen. Die graad 1's het veral die kollig gesteel toe hulle hul taalvermoëns met 'n opvoering van "die alfabet" uitgebeeld het.

## KENNISGEWING VAN GRONDONTWIKKELINGSAAANSOEK IN DIE STELLENBOSCH MUNISIPALE GEBIED

### AAANSOEK OM HERSONERING: PLAAS CALCUTTA NR 29, ADMINISTRATIEWE DISTRIK, STELLENBOSCH

**Aansoeker:** CK Rumboll en Vennote  
**Eienaar:** Stellenbosch Munisipaliteit  
**Aansoeknommer:** LU/94/04  
**Verwysingsnommer:** Plaas 29, Administratiewe Distrik, Stellenbosch  
**Eiendomsbeskrywing:** Plaas Calcutta nr 29  
**Fisiese Adres:** Plaas Calcutta, aangrensend R304, Stellenbosch  
**Beskrywing van aansoek:** Die aangeleentheid vir ommeging is 'n aansoek (ingevolge artikel 15 (2) (a) van die Stellenbosch Munisipale Grondgebruikbeplanningverordening) om die hersonering van Plaas 29 vanaf landbou Sone I na Oopruimtezone II om voorsiening te maak vir die vestiging van 'n Gedenkpark.

Kennis geskied hiermee ingevolge die Stellenbosch Munisipaliteit Verordening op Grondgebruikbeplanning dat die bogenoemde aansoek ontvang is en gedurende weeke dae tussen 08:30 en 13:30 by die Beplanningssakekantoor by Stellenbosch Munisipaliteit, Plainstraat, Stellenbosch ter insae lê. Enige geskrewe kommentaar/besware, met volledige redes daarvoor, moet ingevolge Artikel 50 van die genoemde wetgewing aan die aansoeker op een van die volgende wyse geadresseer word:

**AAANSOEKER**

*Geregistreerde of gewone pos*

CK Rumboll en Vennote, Posbus 211, Malmesbury, 7299. Vir aandag: Jolandie Linnemann

*Of gefaks aan*

022 487 1861

*Of per hand afgelower aan*

CK Rumboll en Vennote, Rainierstraat 16, Malmesbury, 7300. Vir aandag: Jolandie Linnemann

*Of per e-pos gelower aan*


jolandie@rumboll.co.za

Alle kommentare moet op of voor 30 dae vanaf die datum van publikasie van hierdie kennisgewing, met vermelding van die aansoeknommer, verwysingsnommer, u naam, adres en kontakbesonderhede, belangstelling in die aansoek en redes vir kommentaar, deur die bogenoemde party ontvang word. Telefoniese navrae kan aan die aansoeker, Jolandie Linnemann by tel 022 482 1845 gerig word. Enige kommentaar/besware ontvang na die voormelde skryfsluitingsdatum sal as ongeleidelik geag word. Enige persoon wat nie kan skryf nie sal deur 'n Munisipale-amptenaar bygestaan word om hul kommentaar op skrif te stel.




**STELLENDSCHE WERKSTADT**  
**APPLICATION FOR MEMORIAL PARK CALCUTTA NO. 23, ADMINISTRATIVE DIVISION, STELLENDSCHE**  
**PROPOSED PUBLIC MEMORIAL PARK**  
 (Plan Number No. 28, District Office, West Bengal)

**CS RUBROL & PARTNERS**




**Owner:** Stellendsch Werkstadt  
**Application Number:** 14/19/2019  
**Project Name:** Proposed Public Memorial Park  
**Project Location:** 23, Administrative Division, Stellendsch  
**Project Area:** 1.50 Hectare  
**Project Details:** The project is a proposed public memorial park for the 75th anniversary of the independence of India. The park will be situated in the Administrative Division, Stellendsch, West Bengal. The project area is 1.50 Hectare. The project is being implemented by Stellendsch Werkstadt.

**Address:** CS Rubrol & Partners, 14, Bhowani Street, Kolkata, West Bengal.  
 Contact: 98300 88888, 98300 88889, 98300 88890  
 Email: csrubrol@gmail.com, csrubrol@yahoo.com




**STELLENDSCHE WERKSTADT**  
**APPLICATION FOR MEMORIAL PARK CALCUTTA NO. 23, ADMINISTRATIVE DIVISION, STELLENDSCHE**  
**PROPOSED PUBLIC MEMORIAL PARK**  
 (Plan Number No. 28, District Office, West Bengal)

**CS RUBROL & PARTNERS**



**Owner:** Stellendsch Werkstadt  
**Application Number:** 14/19/2019  
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**Address:** CS Rubrol & Partners, 14, Bhowani Street, Kolkata, West Bengal.  
 Contact: 98300 88888, 98300 88889, 98300 88890  
 Email: csrubrol@gmail.com, csrubrol@yahoo.com



19 Nov 2019

**ANNEXURE F**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FORM INTEREST AND AFFECTED  
PROPERTY OWNERS**

**Jolandie Linneman**

---

**From:** Jolandie Linneman [jolandie@rumboll.co.za]

**Sent:** 14 October 2019 02:41 PM

**To:** 'Francois Malan'

**Subject:** RE: Hersonerig Calcutta plaas: LU/9404

Goeie dag Mnr Malan

U e-pos gedateer 11 Oktober 2019 het betrekking.

Ek het navraag gedoen by Stellenbosch Munisipaliteit en is die terugvoer as volg.

1. Baie dankie vir die agtergrond kennis wat u gedeel het.  
Die naam van die voorgestelde begraafplaas/gedenkpark is nie vas nie. Daar kan met die vestiging van die begraafplaas/gedenkpark oor 'n paar opsies besin word wat heel waarskynlik deur 'n publieke deelname proses sal gaan.
2. Met die vestiging van die 'chapel' sal die bestaande argitektuur en landskap in ag geneem word. Die voorstel sal inskakel by die omliggende landelike omgewing soos voorgestel in Mnr Eitzen se verslag. Finale voorstelle sal eers voorgele word indien alle goedkeurings in plek is.

Ek vertrou u vind bogenoemde in orde. Laat weet gerus indien u meer inligting verlang.

Vriendelike groete

Jolandie Linnemann

Stads- en Streekbeplanner/Town and Regional Planner Pr. Pln - A/206/2010

Vir CK Rumboll en Vennote/CK Rumboll and Partners

Tel: 022 482 1845

Fax: 022 487 1661

E-mail: [jolandie@rumboll.co.za](mailto:jolandie@rumboll.co.za)

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**From:** Francois Malan [mailto:fmalan@simonsig.co.za]

**Sent:** 11 October 2019 10:33 AM

**To:** jolandie@rumboll.co.za

**Cc:** Francois Malan

**Subject:** Hersonerig Calcutta plaas: LU/9404

Beste Jolandie

Application for Rezoning: Farm Calcutta Nr 29

Dankie vir die volledige verslag wat ek ontvang het rakende die aansoek om hersonerig van Calcutta bos vir die ontwikkeling van 'n begraafplaas.

Ons het in beginsel nie 'n beswaar teen die voorgenome hersonerig, maar wil graag twee aspekte uitlig.

1. Die ontstaan van die naam 'Calcutta' word nie aangespreek deur die spesialiste in Artikel 8: 8.1 Jonathan Kaplan of 8.7 Bruce Eitzen  
Dis welbekend dat die Koelenhof area gedurende die Anglo Boere oorlog gebruik is as 'n perde voorsieningsplaas. Dit het bekend gestaan as die Koelenhof Remount Camp. Daar is deeglike

2019/10/15

navorsingstukke hieroor gepubliseer deur die Universiteit Stellenbosch. Gedurende hierdie periode is heelwat Indiese personeel deur die Britse magte gebruik om die perde te versorg. Daar is ook 'n mondelinge getuienis dat van die Indiese personeel daar begrawe is. Ek sal graag wil weet wat is die oorsprong van die naam, Calcutta en waarna verwys dit. Ek dink dit is belangrik vir al met die oog op 'n toekomstige naam van die begraafplaas. Gaan dit die Calcutta begraafplaas wees of moontlik die Uitspan begraafplaas?

2. Nêrens word melding gemaak wat die hoogte van die geboue of "chapel" is nie. In die verslag word verwys na 'n "chapel". Ek wil aansluit by die "Visual impact Assessment" 8.9 van Bruce Eitzen dat die beplande geboue moet inpas by die landelike omgewing aangesien die omliggende omgewing bestaan uit wingerde en veld. Ons sal nie 'n kerkoring wil sien nie. Die R304 is die hoof toegangroete na die Kaapse wynlande en die begin die Stellenbosch wynroete. Die beplande ontwikkeling moet nog steeds inpas by 'n landelike visuele gevoel.




Groete  
Francois



FRANCOIS MALAN  
EXECUTIVE DIRECTOR

T: +27 (0)21 888 4900 E: [fmalan@simonsig.co.za](mailto:fmalan@simonsig.co.za)

SIMONSIG WINES, Kromme Rhee Road, Koelenhof, 7605, South Africa

 @SimonsigWines  @SimonsigWines  @simonsigwines

**Jolandie Linneman**

---

**From:** marthinus@agri-x.co.za  
**Sent:** 18 September 2019 10:27 AM  
**To:** jolandie@rumboll.co.za  
**Subject:** Re: Culcutta  
**Importance:** High

Dear Jolandie

Thank you for the information.

The land is currently zoned as agriculture zone 1. Is there any reason why we do not have any input from the Department of Agriculture.

Is it possible to get an idea of the total cost to establish the park as proposed as well as the future maintenance cost.

Kind regards.

Marthinus Saunderson

On 2019-09-18 09:01, WeTransfer wrote:

we

jolandie@rumboll.co.za  
sent you some files

20 items, 71.4 MB in total • Will be deleted on 25 September, 2019

Mnr Sonders

Ons telefoon gesprek van gister en vanoggend het betrekking.  
Aangeheg vind informasie soos versoek.

Vriendelike groete

2019/09/20

**ANNEXURE G**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FROM THE DEPARTMENT OF  
ENVIRONMENTAL AFFAIRS AND DEVELOPMENT  
PLANNING**



Western Cape  
Government  
Environmental Affairs and  
Development Planning

Directorate: Development Management  
(Region 1)

**EIA REFERENCE:** 16/3/3/1/B4/45/1030/19  
**NEAS REFERENCE:** WCP/EIA/0000593/2019  
**ENQUIRIES:** D'mitri Matthews  
**DATE OF ISSUE:** 2019 -09- 2 0

The Municipal Manager  
Stellenbosch Municipality  
P. O. Box 17  
**STELLENBOSCH**  
7599

**Attention: Mr P. Smit**

Tel.: (021) 808 8750

Fax: (021) 887 6167

Dear Sir

**APPLICATION FOR ENVIRONMENTAL AUTHORISATION AND THE ADOPTION OF A FRESHWATER REHABILITATION, MAINTENANCE AND MANAGEMENT PLAN IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014, (AS AMENDED): DEVELOPMENT OF THE CALCUTTA PUBLIC CEMETERY AND MEMORIAL PARK ON FARM NO. 29, STELLENBOSCH**

1. With reference to the above application, the Department hereby notifies you of its decision to **grant** Environmental Authorisation and to **adopt** the Freshwater Rehabilitation, Maintenance and Management Plan, attached herewith, together with the reasons for the decision.
2. In terms of Regulation 4 of the Environmental Impact Assessment Regulations, 2014, (as amended), you are instructed to ensure, within 14 days of the date of the Environmental Authorisation, that all registered Interested and Affected Parties ("I&APs") are provided with access to and reasons for the decision, and that all registered I&APs are notified of their right to appeal.
3. Your attention is drawn to Chapter 2 of the National Appeal Regulations, 2014 (as amended), which prescribes the appeal procedure to be followed. This procedure is summarized in the attached Environmental Authorisation.

Yours faithfully

  
**MR. ZAHIR MOEFY**  
**DIRECTOR: DEVELOPMENT MANAGEMENT (REGION 1)**  
**DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING**

CC: (1) Mr. S. van der Merwe (Stellenbosch Municipality)  
(2) Ms. V. Thompson (EnviroAfrica CC)  
(3) Mr. N. Mkonto (Department of Water and Sanitation)  
(4) Mr. R. Smart (CapeNature)  
(5) Mr. C. van der Walt (Department of Agriculture)

Fax: (021) 886 6899  
Fax: (086) 512 0154  
Fax: (021) 941 6082  
Fax: (086) 529 4992  
Fax: (021) 808 5092

6<sup>th</sup> Floor, 1 Dorp Street, Cape Town, 8001  
Tel: +27 21 483 8350 Fax: +27 21 483 3098  
E-mail: [D'mitri.Matthews@westerncape.gov.za](mailto:D'mitri.Matthews@westerncape.gov.za)

Private Bag X9086, Cape Town, 8000  
[www.westerncape.gov.za/eadp](http://www.westerncape.gov.za/eadp)



**EIA REFERENCE:** 16/3/3/1/B4/45/1030/19  
**NEAS REFERENCE:** WCP/EIA/0000593/2019  
**ENQUIRIES:** D'mitri Matthews  
**DATE OF ISSUE:** 2019 -09- 2 0

## ENVIRONMENTAL AUTHORISATION

### APPLICATION FOR ENVIRONMENTAL AUTHORISATION AND THE ADOPTION OF A FRESHWATER REHABILITATION, MAINTENANCE AND MANAGEMENT PLAN IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) AND THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS, 2014, (AS AMENDED): DEVELOPMENT OF THE CALCUTTA PUBLIC CEMETERY AND MEMORIAL PARK ON FARM NO. 29, STELLENBOSCH

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

## DECISION

By virtue of the powers conferred on it by the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA") and the Environmental Impact Assessment ("EIA") Regulations, 2014 (as amended), the Competent Authority herewith **grants Environmental Authorisation** to the applicant to undertake the listed activities specified in Section B below with respect to Alternative 1, described in the Basic Assessment Report ("BAR"), dated May 2019.

In terms of the NEMA, viz, the EIA Regulations, 2014 (as amended) (in Government Gazette No. 40772 of 7 April 2017) the Competent Authority hereby **adopts the Freshwater Rehabilitation, Maintenance and Management Plan ("FRMMP")** for the associated infrastructure within and adjacent to the watercourse on site, included in the BAR dated May 2019.

The applicant for this Environmental Authorisation is required to comply with the conditions set out in Section E below.

## A. DETAILS OF THE APPLICANT FOR THIS ENVIRONMENTAL AUTHORISATION

Stellenbosch Municipality  
 % Mr. P. Smit  
 P. O. Box 17  
**STELLENBOSCH**  
 7599

6<sup>th</sup> Floor, 1 Dorp Street, Cape Town, 8001  
 Tel: +27 21 483 8350 Fax: +27 21 483 3098  
 E-mail: D'mitri.Matthews@westerncape.gov.za

Private Bag X9086, Cape Town, 8000  
[www.westerncape.gov.za/eadp](http://www.westerncape.gov.za/eadp)



Tel.: (021) 808 8750  
Fax: (021) 887 6167

The abovementioned applicant is the holder of this Environmental Authorisation and is hereinafter referred to as "the holder".

#### B. LIST OF ACTIVITIES AUTHORISED

Listed activities	Activity/Project Description
<p>EIA Regulations Listing Notice 1 of 2014: Activity Number 12: The development of—</p> <p>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or</p> <p><b>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</b></p> <p>where such development occurs—</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —</p> <p>excluding—</p> <p>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such development occurs within an urban area;</p> <p>(ee) where such development occurs within existing roads, road reserves or railway line reserves; or</p> <p>(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.</p>	<p>The proposal will include the construction of boardwalks and wooden bridges as well as a gabion lined drift, over the watercourse that traverses the site.</p>
<p>Activity Number 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells,</p>	<p>The construction and maintenance of the watercourse crossings and the rehabilitation of the watercourse will require the infilling and movement of material in excess of 10m<sup>3</sup>.</p>

<p>shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving—</p> <p>(a) will occur behind a development setback;</p> <p>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;</p> <p>(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;</p> <p>(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or</p> <p>(e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</p>	
<p>Activity Number 23: The development of cemeteries of 2 500 square metres or more in size.</p>	<p>The proposed public cemetery and memorial park will cover an area of approximately 30ha in extent.</p>
<p>Activity Number 24: The development of a road—</p> <p>(i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or</p> <p><b>(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;</b></p> <p>but excluding a road—</p> <p>(a) which [are] is identified and included in activity 27 in Listing Notice 2 of 2014;</p> <p>(b) where the entire road falls within an urban area; or</p> <p>(c) which is 1 kilometre or shorter.</p>	<p>An access road wider than 8m will be constructed as part of the proposal, in an area where no road reserve exists.</p>
<p>EIA Regulations Listing Notice 1 of 2014: Activity Number 4: The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p><b>i. Western Cape</b></p> <p>i. Areas zoned for use as public open space or equivalent zoning;</p> <p>ii. Areas outside urban areas;</p> <p><b>(aa) Areas containing indigenous vegetation;</b></p> <p>(bb) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been</p>	<p>The new access road will be wider than 4m and will require the removal of indigenous vegetation.</p>

<p>determined; or</p> <p>iii. Inside urban areas:</p> <p>(aa) Areas zoned for conservation use; or</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority.</p>	
<p>Activity Number 12:</p> <p>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—</p> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p><b>i. Western Cape</b></p> <p>i. <b>Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</b></p> <p>ii. Within critical biodiversity areas identified in bioregional plans;</p> <p>iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line or even in urban areas;</p> <p>iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or</p> <p>v. On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.</p>	<p>The proposal will include the clearance of more than 300m<sup>2</sup> of critically endangered indigenous vegetation.</p>

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

The holder is herein authorised to undertake the following alternative:

The proposal entails the development of a public cemetery and memorial park that will comprise:

- A traditional grave area which allows for whole-body burials in traditional underground graves with headstones.
- An informal zone. This zone is non-traditional burial sites within a memorial park/landscaped park/garden area with lawn plaques/or a tree of remembrance/tree as

headstone. The zone will incorporate the outspan in the southern section of the site and wetland buffer zones of 25m to 30m for watercourses.

- A columbarium and defined zone. These zones are non-traditional burial sites that comprise of formalized/built, above ground areas where either individual or group burials will take place. These areas include structures with niche/small spaces for placing cremated/legally reduced remains in urns or other approved containers, memorial walls with plaques of remembrance, floor plaques/flat headstones and mausoleums or crypts.
- A defined zone that includes an area for family and group burials and a heroes acre.
- An access road that will be constructed at a dedicated two-way intersection of the R304 at approximate KM 50,37.
- Internal roads of 8m wide near the entrance and around the bus parking and narrower roads for access to other regions within the cemetery and memorial park.
- A perimeter fence with main access gates and an entrance wall on the northern boundary.
- Boardwalks and wooden bridges.
- Gabion lined drift.
- An irrigation reservoir.
- A memorial park center and service zone consisting of:
  - A chapel,
  - Offices and a storage area,
  - Ablution facilities,
  - A workshop,
  - A plant/sapling nursery,
  - Staff accommodation, and
  - A gathering space.
- A sewer treatment plant and network.
- A storm water network and treatment plant. The subsurface storm water network will discharge storm water into a reed bed/storm water treatment system. A storm water attenuation pond will form part of the storm water management system.
- A security route along the boundary of the site.

### C. SITE DESCRIPTION AND LOCATION

The listed activities will be undertaken on Farm No. 29, Stellenbosch, at the following co-ordinates:

Latitude (S)	Longitude (E)
33° 51' 13.55"	18° 48' 35.96"

The SG digit code is: C0670000000002900000

Refer to Annexure 1: Locality Map and Annexure 2: Site Development Plan.

The above is hereinafter referred to as "the site".

### D. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

EnviroAfrica CC  
% Ms. V. Thomson  
P. O. Box 5367

**HELDERBERG**

7135

Tel.: (021) 851 1616

Fax: (086) 512 0154

**E. CONDITIONS OF AUTHORISATION****Scope of authorisation**

1. The holder is authorised to undertake the listed activities specified in Section B above in accordance with, and restricted to, Alternative 1, as described in the BAR dated May 2019 at the site as described in Section C above.
2. The holder must commence with the listed activities on site within a period of **five (5) years** from the date of issue of this Environmental Authorisation.
3. The development must be concluded within **10 years** from the date of commencement of the first listed activity.
4. The holder shall be 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.
5. Any changes to, or deviations from the scope of the alternative described 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 information, in order 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.

**Written notice to the Competent Authority**

6. Seven calendar days' notice, in writing, must be given to the Competent Authority before commencement of construction activities. The notice must:
  - 6.1 make clear reference to the site details and EIA Reference number given above; and
  - 6.2 include proof of compliance with the following conditions described herein:

Conditions: 7, 8 and 12

**Notification and administration of appeal**

7. The holder must in writing, within 14 (fourteen) calendar days of the date of this decision—
  - 7.1 notify all registered Interested and Affected Parties ("I&APs") of –
    - 7.1.1 the outcome of the application;
    - 7.1.2 the reasons for the decision as included in Annexure 3;
    - 7.1.3 the date of the decision; and

- 7.1.4 the date when the decision was issued.
- 7.2 draw the attention of all registered I&APs to the fact that an appeal may be lodged against the decision in terms of the National Appeals Regulations, 2014 (as amended) detailed in Section G below;
- 7.3 draw the attention of all registered I&APs to the manner in which they may access the decision; and
- 7.4 provide the registered I&APs with:
  - 7.4.1 the name of the holder (entity) of this Environmental Authorisation;
  - 7.4.2 name of the responsible person for this Environmental Authorisation;
  - 7.4.3 postal address of the holder;
  - 7.4.4 telephonic and fax details of the holder;
  - 7.4.5 e-mail address, if any, of the holder; and
  - 7.4.6 contact details (postal and/or physical address, contact number, facsimile and e-mail address) of the decision-maker and all registered I&APs in the event that an appeal is lodged in terms of the 2014 National Appeals Regulations (as amended).
- 8. The listed activities, including site preparation, must not commence within 20 (twenty) calendar days from the date the applicant notifies the registered I&APs of this decision. In the event that an appeal is lodged with the Appeal Authority, the effect of this Environmental Authorisation is suspended until the appeal is decided i.e. the listed activities, including site preparation, must not commence until the appeal is decided.

#### **Management of activity**

- 9. The draft Environmental Management Programme ("EMPr") submitted as part of the application for Environmental Authorisation is hereby approved and must be implemented.
- 10. The Freshwater Rehabilitation, Maintenance and Management Plan ("FRMMP") adopted as part of this Environmental Authorisation must be implemented.
- 11. The EMPr and FRMMP must be included in all contract documentation for all phases of implementation.

#### **Monitoring**

- 12. The holder must appoint a suitably experienced environmental control officer ("ECO"), or site agent where appropriate, before commencement of any land clearing or construction activities to ensure compliance with the EMPr, FRMMP and the conditions contained herein.
- 13. A copy of the Environmental Authorisation, EMPr, FRMMP, audit reports and compliance monitoring reports must be kept at the site of the authorised activity, and must be made available to anyone on request, including on a publicly accessible website.
- 14. Access to the site referred to in Section C must be granted, and the environmental reports mentioned above 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.

**Auditing**

15. In terms of Regulation 34 of the NEMA EIA Regulations, 2014 (as amended), the holder must conduct environmental audits to determine compliance with the conditions of the Environmental Authorisation, the EMPr and submit Environmental Audit Reports to the Competent Authority. The Environmental Audit Report must be prepared by an independent person and must contain all the information required in Appendix 7 of the NEMA EIA Regulations, 2014 (as amended).

The ECO must conduct fortnightly site audits. Monthly ECO Audit Reports must be submitted to the Competent Authority for the duration of the construction phase. The final Environmental Audit Report must be submitted to the Competent Authority six months after operation commenced.

The holder must, within 7 days of the submission of each of the above-mentioned reports to the Competent Authority, notify all potential and registered I&APs of the submission and make the report available to anyone on request and on a publicly accessible website (if applicable).

**Specific Conditions**

16. Should any heritage remains be exposed during excavations or any other actions on the site, these must immediately be reported to the Provincial Heritage Resources Authority of the Western Cape, Heritage Western Cape. 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: meteorites, archaeological and/or paleontological remains (including fossil shells and trace fossils); coins; indigenous and/or colonial ceramics; any articles of value or antiquity; marine shell heaps; stone artefacts and bone remains; structures and other built features with heritage significance; rock art and rock engravings; and/or graves or unmarked human burials including grave goods and/or associated burial material.

17. A qualified archaeologist and/or palaeontologist must be contracted where necessary (at the expense of the holder) to remove any heritage remains. Heritage remains can only be disturbed by a suitably qualified heritage specialist working under a directive from the relevant heritage resources authority.

**F. GENERAL MATTERS**

1. Notwithstanding this Environmental Authorisation, the holder must comply with any other statutory requirements that may be applicable when undertaking the listed activities.
2. Non-compliance with a condition of this Environmental Authorisation or EMPr may render the holder liable to criminal prosecution.
3. If the holder does not commence with the listed activities within the period referred to in Condition 2, this Environmental Authorisation shall lapse for that activity, and a new application for Environmental Authorisation must be submitted to the Competent Authority. If the holder wishes to extend the validity period of the Environmental Authorisation, an

application for amendment in this regard must be made to the Competent Authority prior to the expiry date of the Environmental Authorisation.

4. The holder 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. If a new holder is proposed, an application for Amendment in terms of Part 1 of the EIA Regulations, 2014 (as amended) must be submitted.

Please note that an amendment is not required if there is a change in the contact details of the holder. In this case, the Competent Authority must only be notified of such changes.

5. The manner and frequency for updating the EMPr is as follows:  
Amendments to the EMPr must be done in accordance with Regulations 35 to 37 of the EIA Regulations, 2014 (as amended) or any relevant legislation that may be applicable at the time.

## **G. APPEALS**

Appeals must comply with the provisions contained in the National Appeal Regulations 2014 (as amended).

1. An appellant (if the holder of the decision) must, within 20 (twenty) calendar days from the date on which notification of the decision was sent to the holder by the Competent Authority –
  - 1.1. submit an appeal in accordance with Regulation 4 of the National Appeal Regulations 2014 (as amended) to the Appeal Administrator; and
  - 1.2. submit a copy of the appeal to any registered I&APs, any Organ of State with interest in the matter and the decision-maker i.e. the Competent Authority that issued the decision.
2. An appellant (if NOT the holder of the decision) must, within 20 (twenty) calendar days from the date on which the holder of the decision sent notification of the decision to the registered I&APs–
  - 2.1. submit an appeal in accordance with Regulation 4 of the National Appeal Regulations 2014 (as amended) to the Appeal Administrator; and
  - 2.2. submit a copy of the appeal to the holder of the decision, any registered I&AP, any Organs of State with interest in the matter and the decision-maker i.e. the Competent Authority that issued the decision.
3. The holder of the decision (if not the appellant), the decision-maker that issued the decision, the registered I&AP and the Organs of State must submit their responding statements, if any, to the appeal authority and the appellant within 20 (twenty) calendar days from the date of receipt of the appeal submission.
4. The appeal and the responding statement must be submitted to the address listed below:



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 Marius Venter (Tel: 021 483 2659)  
Room 809  
8<sup>th</sup> Floor Utilitas Building, 1 Dorp Street, Cape Town, 8001

**Note:** For purposes of electronic database management, you are also requested to submit electronic copies (Microsoft Word format) of the appeal, responding statement and any supporting documents to the Appeal Authority to the address listed above and/ or via e-mail to DEADP.Appeals@westerncape.gov.za

5. A prescribed appeal form as well as assistance regarding the appeal processes is obtainable from Appeal Authority at: Tel. (021) 483 2659, E-mail DEADP.Appeals@westerncape.gov.za or URL <http://www.westerncape.gov.za/eadp>.

#### H. 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

  
MR. ZAHIR TOEFY

**DIRECTOR: DEVELOPMENT MANAGEMENT (REGION 1)**  
**DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING**

DATE OF DECISION: 20/09/2019

CC: (1) Mr. S. van der Merwe (Stellenbosch Municipality)  
(2) Ms. V. Thompson (EnviroAfrica CC)  
(3) Mr. N. Mkonto (Department of Water and Sanitation)  
(4) Mr. R. Smart (CapeNature)  
(5) Mr. C. van der Walt (Department of Agriculture)

Fax: (021) 886 6899  
Fax: (086) 512 0154  
Fax: (021) 941 6082  
Fax: (086) 529 4992  
Fax: (021) 808 5092

**ANNEXURE 1: LOCALITY MAP**



Figure 1: Locality map.

**ANNEXURE 2: SITE DEVELOPMENT PLAN**

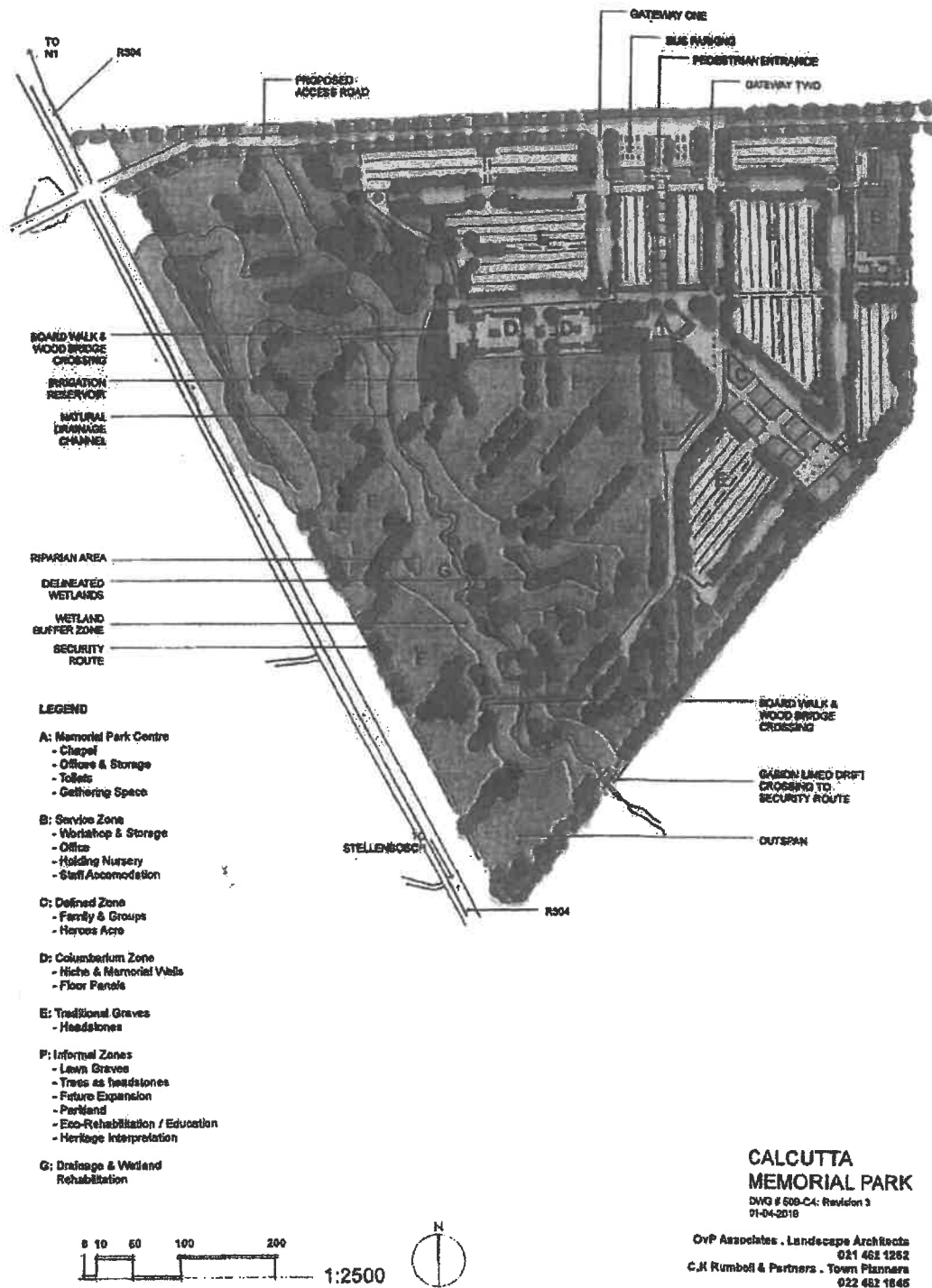


Figure 2: Site development plan for the cemetery and memorial park.

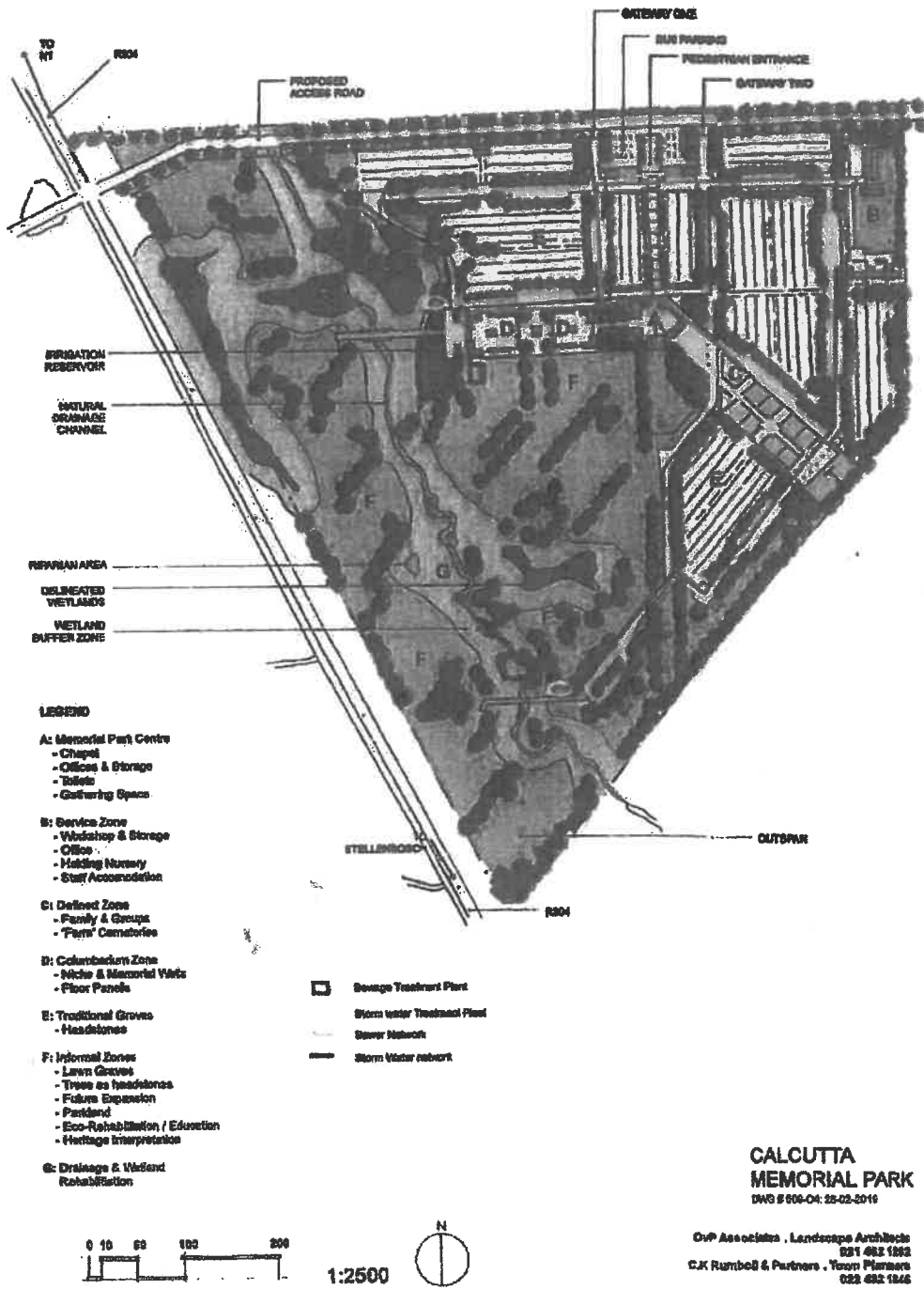


Figure 3: Storm water and sewage plan layout.

**ANNEXURE 3: REASONS FOR THE DECISION**

In reaching its decision, the Competent Authority considered, amongst others, the following:

- a) The information contained in the Application Form dated 16 April 2019, the final BAR dated May 2019 and the EMPr and FRMMP submitted together with the final BAR;
- b) Relevant information contained in the Departmental information base, including the Guidelines on Public Participation and Alternatives (dated March 2013);
- c) The objectives and requirements of relevant legislation, policies and guidelines, including Section 2 of NEMA;
- d) The comments received from I&APs and responses to these, included in the BAR dated May 2019; and
- e) The balancing of negative and positive impacts and proposed mitigation measures.

No site visits were conducted. The Competent Authority had sufficient information before it to make an informed decision without conducting a site visit.

All the concerns raised by I&APs were responded to and addressed during the public participation process. Specific management and mitigation measures have been considered in this Environmental Authorisation EMPr and in the FRMMP, in order to address the concerns raised.

**1. Public Participation**

The public participation process included:

- identification of and engagement with I&APs;
- fixing notice boards at the sites where the listed activities are to be undertaken on 7 February 2018;
- the placing of a newspaper advertisement in the 'Elkestad Nuus' on 8 February 2018;
- giving written notice to the owners and occupiers of land adjacent to the site where the listed activities are to be undertaken, the municipality and ward councillor, and the various Organs of State having jurisdiction in respect of any aspect of the listed activities, on 14 September 2017, 9 February 2018, 15 November 2018, 1 February 2019 and 23 April 2019; and
- making the pre-application draft BAR's available to I&APs from 15 November 2018 and 1 February 2019 and making the in-process draft BAR available to I&APs for public review from 23 April 2019.

All the concerns raised by I&APs were responded to and addressed during the public participation process. Specific management and mitigation measures have been considered in this Environmental Authorisation and EMPr, in order to address the concerns raised.

The Competent Authority notes the Environmental Assessment Practitioner's responses to the issues raised during the public participation process and has included appropriate conditions in this Environmental Authorisation and in the EMPr.

## 2. Alternatives

Layout alternatives were assessed as part of the application and are discussed below.

### Alternative 1 (Herewith Authorised):

The proposal entails the development of a public cemetery and memorial park that will comprise:

- A traditional grave area which allows for whole-body burials in traditional underground graves with headstones.
- An informal zone. This zone is non-traditional burial sites within a memorial park/landscaped park/garden area with lawn plaques/or a tree of remembrance/tree as headstone. The zone will incorporate the outspan in the southern section of the site and wetland buffer zones of 25m to 30m for watercourses.
- A columbarium and defined zone. These zones are non-traditional burial sites that comprise of formalized/built, above ground areas where either individual or group burials will take place. These areas include structures with niche/small spaces for placing cremated/legally reduced remains in urns or other approved containers, memorial walls with plaques of remembrance, floor plaques/flat headstones and mausoleums or crypts.
- A defined zone that includes an area for family and group burials and a hero's acre.
- An access road that will be constructed at a dedicated two-way intersection of the R304 at approximate KM 50,37.
- Internal roads of 8m wide near the entrance and around the bus parking and narrower roads for access to other regions within the cemetery and memorial park.
- A perimeter fence with main access gates and an entrance wall on the northern boundary.
- Boardwalks and wooden bridges.
- Gabion lined drift.
- An irrigation reservoir.
- A memorial park center and service zone consisting of:
  - A chapel,
  - Offices and a storage area,
  - Ablution facilities,
  - A workshop,
  - A plant/sapling nursery,
  - Staff accommodation, and
  - A gathering space.
- A sewer treatment plant and network.
- A storm water network and treatment plant. The subsurface storm water network will discharge storm water into a reed bed/storm water treatment system. A storm water attenuation pond will form part of the storm water management system.
- A security route along the boundary of the site.

This alternative is preferred as the layout plan accommodates wetland buffer zones between 25m and 30m, whilst providing ample memorial park/garden space to the west of the site. The additional crossing over the non-perennial drainage line will also enable the security team to have ease of access to the entire site during monitoring of the route. This alternative does not locate the conservancy tank/sewer treatment plant within the wetland buffer zone and makes provision for two storm water treatment plants and a storm water retention pond within the storm water network.

### Alternative 2:

This alternative is similar to Alternative 1, with the exception of the wetland buffer zones ranging between 10m and 15m, structures (maintenance and nursery building) as well as cultivated areas

(orchards) within the wetland buffer zones and the conservancy tank being located in the wetland buffer zone and in close proximity to the non-perennial drainage line.

This alternative is not preferred since the layout does not allow for the maximum wetland buffer zones to be established and it places structures (maintenance and nursery building) as well as cultivated areas (orchards) in areas that are to be rehabilitated and maintained as part of a park. Additionally, the location of the conservancy tank within the wetland buffer zone is not appropriate and this alternative does not make provision for an effluent treatment plant or a retention pond.

### Alternative 3:

This alternative is similar to Alternative 2, except that the access road off the R304 is located at KM 50,58.

This alternative is not preferred for the same reasons as provided for Alternative 2. In addition, this alternative is not preferred as it does not take the Final Traffic Study's recommendation into consideration that the access road off the R304 must be located at KM 50.37.

### "No-Go" Alternative

The "no-go" option to not develop a public cemetery and memorial park was considered. However, it is not preferred because it will not address the need for additional burial space within Stellenbosch Municipality, which currently has very limited burial space at existing cemeteries.

## **3. Impact Assessment and Mitigation measures**

### **3.1 Activity Need and Desirability**

There is currently a shortage of land within Stellenbosch Municipality for the development of public cemeteries. The existing public cemeteries within Stellenbosch Municipality are nearing maximum occupation and alternative land for public cemeteries is needed. The proposed public cemetery and memorial park will address the limited burial space within the municipality. The specialist studies conducted during the EIA process has informed the layout of the site to avoid and mitigate impacts and provide the best practicable environmental option.

### **3.2 Biodiversity and Biophysical Impacts**

According to the Botanical Statement dated 30 January 2019, compiled by Mr. P. Botes of PB Consulting, the site would have been historically comprised of Swartland Shale Renosterveld, an ecosystem listed as critically endangered in terms of Section 52 of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) ("NEMBA"). The site is however, overgrown by a dense mix of alien invasive vegetation and approximately 5% of the site contains hardy shrubs or pioneer species. The site has been previously disturbed by sand mining, as well as harvesting and dumping, which has further degraded the area. The Botanical Statement concluded that the proposed development will not have any significant impact on indigenous vegetation. Through the implementation of the EMP (accepted in Section E, Condition 9), the impact on indigenous vegetation will be limited.

According to the Freshwater Impact Assessment dated May 2019, compiled by Mr. J. Gericke of EnviroSwift, a non-perennial drainage line and a mosaic of depression wetlands were identified and delineated. The northern section of the non-perennial drainage line (between the northern boundary and northernmost wetland) is artificial and has been excavated historically. This may have been a measure to drain the northernmost wetland. The rest of the non-perennial drainage line is natural and has been subjected to substantial erosion, which is related to the presence of alien invasive vegetation. The present ecological state of the non-perennial drainage line is

classified as being largely modified, since there has been a large loss of natural habitat, biota and ecosystem functions. The ecological importance and sensitivity of the non-perennial drainage line is deemed to be moderate, since it has been severely impacted by alien invasive vegetation and the introduction of storm water runoff from the R304. However, rehabilitation is not excessively difficult, since the natural course seems to be intact. The mosaic of depression wetlands was delineated within the southern and north-western portion of the site. They are largely modified and have a moderate ecological importance. Through the implementation of the EMPr (accepted in Section E, Condition 9) and FRMMP (adopted in Condition 10), the impact on the non-perennial drainage line and depression wetlands will be mitigated.

Furthermore, a Water Use Licence Application ("WULA") in terms of the National Water Act, 1998 (Act 38 of 1998) will be submitted to the Department of Water and Sanitation, that will assess the water related impacts further.

A FRMMP has been compiled to address future maintenance activities taking place in the affected watercourse. The maintenance of the structures authorised in this Environmental Authorisation forms part of this FRMMP. It must be noted that the accepted maintenance activities only relate to the activities described in the FRMMP. Should any new activities and associated infrastructure, not included in the FRMMP, require maintenance and if any of the applicable listed activities are triggered, an Environmental Authorisation must be obtained prior to the undertaking of such activities. It remains the responsibility of the proponent to determine if any other listed activities are triggered and to ensure that the necessary Environmental Authorisation is obtained.

The fact that the FRMMP is adopted by the Competent Authority does not absolve the applicant from its general "duty of care" set out in Section 28(1) of the NEMA, which states that "Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment." (Note: When interpreting their "duty of care" responsibility, cognisance must be taken of the principles of sustainability contained in Section 2 of NEMA).

### 3.3 Geohydrological Impacts

According to the Geohydrological Assessment dated 23 October 2018, compiled by Mr. C. Peek of Geohydrological and Spatial Solutions International (Pty) Ltd, the site is located on a fractured aquifer. Most of the site is classified as having a low/medium groundwater vulnerability rating. The southern portion of the site has been classified as medium grading into a very high vulnerability classification. Traditional burial sites have however, been located in the north eastern and eastern section, which is away from the medium to very high vulnerability areas to avoid potential impacts on groundwater. Through the implementation of the EMPr (accepted in Section E, Condition 9), groundwater impacts will be mitigated.

### 3.4 Heritage Impacts

According to the Heritage Impact Assessment dated November 2018, compiled by New World Associates, no fossil remains were recorded during the palaeontological site visit, therefore it is unlikely to expect significant impacts palaeontological heritage. No pre-colonial archaeological heritage and no buildings, structures or features were encountered during the field assessment. Impacts on archaeological heritage is not anticipated. The proposed public cemetery and memorial park will have a medium impact and significance on the landscape, in terms of the visual impact associated with the development. An outspan has been identified in the south



western corner of the site. The area containing the outspan has however, been included in the informal park zone, to preserve the significance of this heritage feature within this landscape. Through the implementation of the EMPr (accepted in Section E, Condition 9), impacts on heritage resources will be mitigated.

### 3.5 Traffic Impacts

According to the Traffic Impact Assessment dated March 2019, compiled by Sturgeon Consulting (Pty) Ltd, the proposed new intersection at the northern boundary (KM 50,37) of the site will operate at acceptable levels of service.

The development will result in both negative and positive impacts.

#### **Negative Impacts:**

- There will be a minimal impact on the remaining indigenous vegetation.
- Impacts on the watercourse is expected during construction, however, rehabilitation of the stream will be undertaken.

#### **Positive impacts:**

- Additional land for burial will become available.
- The non-perennial drainage line and wetlands will be rehabilitated.
- Alien invasive plants will be removed.
- Employment opportunities will be created during the construction and operational phases.

## 4. National Environmental Management Act Principles

The NEMA 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.

## 5. Conclusion

In view of the above, the NEMA principles, compliance with the conditions stipulated in this Environmental Authorisation, and compliance with the EMPr, 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 NEMA and that any potentially detrimental environmental impacts resulting from the listed activities can be mitigated to acceptable levels.

—END—

**ANNEXURE H**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FROM THE DEPARTMENT OF  
AGRICULTURE (ELSENBURG)**

20

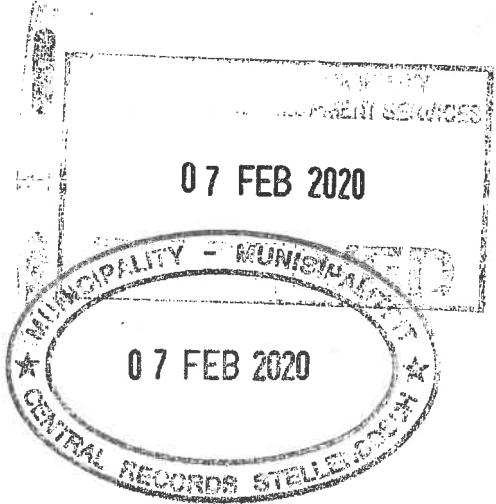


Cor Van Der Walt  
Land Use Management  
Email: LandUse.Elsenburg@elsenburg.com  
tel: +27 21 808 5099 fax: +27 21 808 5092

**OUR REFERENCE** : 20/9/2/5/6/904  
**YOUR REFERENCE** : Farm 29, Stellenbosch division  
**ENQUIRIES** : Cor van der Walt

CK Rumboll & Partners  
PO Box 211  
MALMESBURY  
7299

Att: Anelia Coetzee



**APPLICATION FOR REZONING: DIVISION STELLENBOSCH**  
**FARM CALCUTTA NO 29**

Application Form with fields for:  
Application No: [ ]  
SCAN NR: F 293  
COLLABORATOR NR: 678188

Your application of 12 September 2019 has reference.

The Western Cape Department of Agriculture: Land Use Management has no objection to the proposed application but have the following comments and conditions:

- a) The area has duplex soils prone to saturated conditions for short to medium periods (possibly 2-3 months) of the year in the subsoil. Subsurface drainage have to be considered to minimise the effect of saturation/high water table. Wetlands are also present and need to be preserved.
- b) Surface run-off water as well as lateral drainage of water on top of clay layers needs to be mitigated as to prevent contamination, pollution or sedimentation of the drainage line and Plankenburg River.

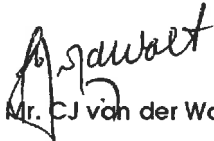
Conditions

That the neighbouring farms right to farm and that what is normally associated with that (including boreholes, farm infrastructure and day to day farming activities but not limited too) be protected at all costs and that the cemetery and use thereof not impede in any way possible and that the owners/managers and successors in title agree to that.

Please note:

- That this is only a recommendation to the relevant deciding Authorities in terms of the Subdivision of Agricultural Land Act 70 of 1970.
- Kindly quote the above-mentioned reference number in any future correspondence in respect of the application.
- The Department reserves the right to revise initial comments and request further information based on the information received.

Yours sincerely



Mr. CJ van der Walt

**LANDUSE MANAGER: LANDUSE MANAGEMENT**

**2020-01-17**

Copy:

Stellenbosch Municipality

PO Box 17

STELLENBOSCH

7599

**ANNEXURE I**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FROM HERITAGE WESTERN CAPE**

**Our Ref:** HM/CAPE WINELANDS/STELLENBOSCH/FARM CALCUTTA BOS 29  
**Case No.:** 18111404AS0417M  
**Enquires:** Andrew September  
**E-mail:** [andrew.september@westerncape.gov.za](mailto:andrew.september@westerncape.gov.za)  
**Tel:** 021 483 9543  
**Date:** 14 June 2019



Bruce Eitzen  
 New World Associates, Landscape Architects  
 17, 1st Crescent  
 Fish Hoek  
 7975

#### FINAL COMMENT

In terms of Section 38(8) of the National Heritage Resources Act (Act 25 of 1999) and the Western Cape Provincial Gazette 6061, Notice 298 of 2003

**FINAL COMMENT: PROPOSED CEMETRY AND MEMORIAL PARK ON FARM CALCUTTA BOS 29, STELLENBOSCH, SUBMITTED IN TERMS OF SECTION 38(8) OF THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)**

**CASE NUMBER: 18111404AS0417M**

The matter above has reference.

Heritage Western Cape is in receipt of your application for the above matter received on 03 June 2019. This matter was discussed at the Heritage Officials Meeting held on the 10 June 2019.

#### FINAL COMMENT

The HIA meets the requirements of S38(3) of the NHRA. The consultant recommendation on page 71-74 is endorsed including the following additional recommendation that an archaeological walk down survey be conducted after vegetation clearance and the report submitted to HWC for endorsement.

If any unexpected archaeological or palaeontological material or evidence of burials is discovered during earth-moving activities all works must be stopped and Heritage Western Cape must be notified immediately.

This approval does not exonerate the applicant from obtaining any necessary approval from any other applicable statutory authority.

HWC reserves the right to request additional information as required. Should you have any further queries, please contact the official above and quote the case number.

Yours faithfully

Dr. Mxolisi Dlamuka  
 Chief Executive Officer, Heritage Western Cape

[www.westerncape.gov.za/cas](http://www.westerncape.gov.za/cas)

Street Address: ... • Postal Address: ...  
 • Tel: ... • E-mail: ...  
 Straatadres: ... • Posaadres: ...  
 • Tel: ... • E-pos: ...  
 Idilezi yendawo: ... • Idilezi yeposi: ...  
 • Inombolo zomxeba: ... • Idilezi ye-imeyile: ...

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**Jolandie Linneman**

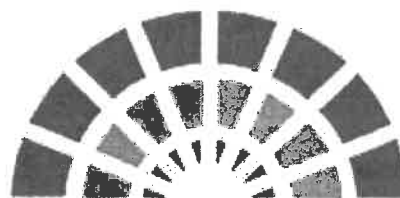
**From:** Andrew T September [Andrew.September@westerncape.gov.za]  
**Sent:** 05 November 2019 03:07 PM  
**To:** Jolandie Linneman  
**Subject:** RE: Proposed rezoning of the Farm Calcutta nr 29, Division Stellenbosch  
 Afternoon Jolandie

Thanks for the prompt response, you may use the final comment as our final response regarding the proposal.

**Kind Regards**

If you wish to make an appointment or request a site meeting with myself, please send your formal request via my email address or contact me on the number below.

**Andrew September**  
**Heritage Officer (Archaeology)**  
 Heritage Western Cape  
 3<sup>rd</sup> Floor, Protea Assurance Building  
 Green Market Square  
 Cape Town  
 8001  
 t) 021 483 9543/9598/9692  
 e) [andrew.september@westerncape.gov.za](mailto:andrew.september@westerncape.gov.za)  
 f) [www.hwc.org.za](http://www.hwc.org.za)



**ILifa leMveli leNtshona Koloni**  
**Erekhis Wes-Kaap**  
**Heritage Western Cape**

**From:** Jolandie Linneman [mailto:jolandie@rumboll.co.za]  
**Sent:** 05 November 2019 01:35 PM  
**To:** Andrew T September <Andrew.September@westerncape.gov.za>  
**Subject:** RE: Proposed rezoning of the Farm Calcutta nr 29, Division Stellenbosch  
**Importance:** High

Hello Andrew

Yes, it is the same application. Your comment was given on the Environmental Process; we are now busy with the Town Planning land use application. As it is the same application, you can just use your comments as is and just address them to me?

Kind regards

Jolandie Linnemann

Stads- en Streekbeplanner/Town and Regional Planner Pr. Pln - A/206/2010

Vir CK Rumboll en Vennote/CK Rumboll and Partners

Tel: 022 482 1845

Fax: 022 487 1661

2019/11/06

E-mail: [jolandie@rumboll.co.za](mailto:jolandie@rumboll.co.za)

**From:** Andrew T September [<mailto:Andrew.September@westerncape.gov.za>]  
**Sent:** 05 November 2019 12:19 PM  
**To:** Jolandie Linneman  
**Subject:** RE: Proposed rezoning of the Farm Calcutta nr 29, Division Stellenbosch

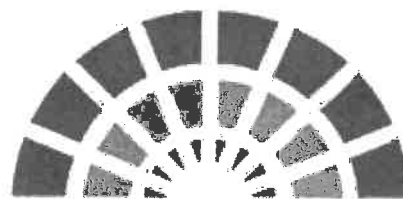
Morning Jolandie

Does the application respond to the development proposal indicated in the attached Final Comment?

Kind Regards

If you wish to make an appointment or request a site meeting with myself, please send your formal request via my email address or contact me on the number below.

**Andrew September**  
**Heritage Officer (Archaeology)**  
 Heritage Western Cape  
 3<sup>rd</sup> Floor, Protea Assurance Building  
 Green Market Square  
 Cape Town  
 8001  
 t) 021 483 9543/9598/9692  
 e) [andrew.september@westerncape.gov.za](mailto:andrew.september@westerncape.gov.za)  
 f) [www.hwc.org.za](http://www.hwc.org.za)



ILifa leMveli leNtshona Koloni  
 Erienis Wes-Koep  
 Heritage Western Cape

**From:** Jolandie Linneman [<mailto:jolandie@rumboll.co.za>]  
**Sent:** 05 November 2019 11:47 AM  
**To:** Andrew T September <[Andrew.September@westerncape.gov.za](mailto:Andrew.September@westerncape.gov.za)>  
**Subject:** Re: Proposed rezoning of the Farm Calcutta nr 29, Division Stellenbosch  
**Importance:** High

Good day Andrew

We act as Town Planners on behalf of Stellenbosch Municipality and were instructed to lodge an application for rezoning on Farm Calcutta nr 29 in order to obtain rights for a memorial park. We have sent a copy of the application to your offices for comment (see attached letter), but to date received no correspondence. Please confirm whether your offices received the application, and by when we can expect your comments.

Kind regards

Jolandie Linnemann

Stads- en Streekbeplanner/Town and Regional Planner Pr. Pln - A/206/2010

Vir CK Rumboll en Vennote/CK Rumboll and Partners

Tel: 022 482 1845

Fax: 022 487 1661

2019/11/06



**ANNEXURE J**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FROM THE STELLENBOSCH HERITAGE  
FOUNDATION**



ERFENIS STIGTING  
STELLENBOSCH  
HERITAGE FOUNDATION

18 November 2019

VIA EMAIL

Dear Mr. Christopher van der Walt

**RE: Proposed Memorial Park on Farm Calcutta RE/29 near Stellenbosch, Cape Winelands District Municipality, Western Cape**

We have received the notice for the rezoning application of Farm Calcutta Nr. 29, Stellenbosch as well as the landscape plan for this development.

We have no objection to your application.

Yours Faithfully

Ronel Fourie ✱

R.W. Fourie

☎ 076 669 5292

✉ [chairperson@stellenboschheritage.co.za](mailto:chairperson@stellenboschheritage.co.za)

<http://www.stellenboschheritage.co.za>

ON BEHALF OF:  
STELLENBOSCH HERITAGE FOUNDATION

**ANNEXURE K**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FROM THE DEPARTMENT OF TRANSPORT  
AND PUBLIC WORKS**



## ROAD NETWORK MANAGEMENT

Email: Grace.Swanepoel@westerncape.gov.za

tel: +27 21 483 4669

Rm 335, 9 Dorp Street, Cape Town, 8001

PO Box 2603, Cape Town, 8000

**REFERENCE: TPW/CFS/RP/LUD/REZ/SUB-25/342 (Job 27333)****ENQUIRIES: Ms GD Swanepoel****DATE: 15 November 2019**

Director: Planning and Economic Development  
 Stellenbosch Municipality  
 PO Box 17  
**STELLENBOSCH**  
 7599

Attention: Mr U von Mollendorff

Dear Sir

FILE NR:	
SCAN NR:	F 295
COLLABORATOR NR:	670856



**FARM CALCUTTA 29, STELLENBOSCH; MAIN ROAD 174 (THE R304); APPLICATION FOR REZONING:**

1. Letter, ref. Stel/9494/JL, Stellenbosch Municipal Application No. LU/9404 and file ref. Farm 29 Stellenbosch Division, from CK Rumboll & Partners to this Branch dated 12 September 2019 refers.
2. The application is for the rezoning of Farm 29 Stellenbosch from Agriculture Zone I to Open Space Zone II in order to establish a regional cemetery/memorial park.
3. Access to the proposed memorial park is proposed in the application to be at  $\pm$ km50.37L on Main Road 174, the R304. The access management plan for Main Road 174 proposed a future roundabout or signalised intersection at  $\pm$ km50.58. The Traffic Impact Assessment (TIA) included in the application proposes relocating this future intersection and providing access to the properties on both sides of Main Road 174 there. In terms of access spacing, this is acceptable, however, the relocation of the access on the opposite side from the subject property may pose environmental and cost concerns, as it would require the access road opposite to go through an existing pond/vlei. It is not known if this is man-made or natural and whether it has environmental significance, but it may be necessary to relocate the proposed cemetery access point further south, to avoid having either a staggered intersection, or to have the access to the opposite property going through the pond.
4. The application proposes a Class 3 municipal road, which could also serve as an access to future developments to the east.
5. As indicated in the TIA, a northbound right turn lane on Main Road 174 is required, as well as a southbound left turn taper.

6. Vehicles turning right out of this side road may experience lengthy delays due to the volume of traffic on Main Road 174, particularly if a funeral ends at a busy time on Main Road 174 and if a significant proportion of attendees leave to the north. However, most funerals taking place out of peak periods on weekdays, or at weekends and the implementation of measures (such as traffic signals) that would impact mobility on Main Road 174 should be avoided as far as possible. It is considered that such delays as do occur will be within acceptable ranges. Nevertheless, it would be desirable to provide two lanes along the main access road serving the cemetery at the approach to Main Road 174, so that left turners are not unnecessarily delayed.
7. This Branch offers no objection to the application for the rezoning of Farm 29 Stellenbosch from Agriculture Zone I to Open Space Zone II in order to establish a regional cemetery/memorial park, subject to the following conditions:
  - 7.1 A review by the applicant's professional team of the most appropriate place for the provision of an access to the subject property, taking into account the feasibility of locating an access directly opposite to serve the property on the west side of Main Road 174 and possible environmental constraints and approval thereof by this Branch;
  - 7.2 The installation of a right turn lane on Main Road 174 (the R304) northbound and at least a left turn taper southbound, with the road widened sufficiently to retain constant width shoulders;
  - 7.3 The widening of the access road as it approaches Main Road 174 to operate as separate left turn and right turn lanes;
  - 7.4 The Applicant accepting in writing to be responsible for all costs associated with the design and implementation of the required road upgrades;
  - 7.5 The design of the road widening, right turn lane, left turn taper and access road widening shall be carried out by an appropriately registered person in accordance with this Department's design guidelines and requirements. Detailed drawings of the road geometry, pavement/materials, drainage, and road signs and markings shall be submitted to the Design Directorate (Ms MK Hofmeyr, ph. 021 483 5713) of this Branch for approval prior to the commencement of construction;
  - 7.6 Detailed construction drawings and proposals for traffic accommodation during construction shall be submitted for approval to the District Roads Engineer, Paarl prior to construction;
  - 7.7 The Applicant's consultant or contractor shall accept the handing over of the site in writing from the Road Authority prior to construction;

- 7.8 After completion of the construction phases to the satisfaction of the District Roads Engineer, Paarl the Road Authority shall accept in writing the handing over of the site from the Applicant's consultant or contractor and
- 7.9 As built drawings shall be sent to this Branch (Ms GD Swanepoel) the District Roads Engineer, Paarl, (021 863 2020) and the Roads Department of Cape Winelands District Municipality (Mr ACA Stevens - 086 126 5263).

Yours faithfully



**SW CARSTENS**

**For CHIEF DIRECTOR: ROAD NETWORK MANAGEMENT**

**ANNEXURE L**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FOR THE MANAGER: COMMUNITY  
SERVICES**

## INTERDEPARTMENTAL CIRCULATION FORM

LêER VERW/ FILE REF	Farm 29, Stellenbosch	DATE: 21 August 2019
AANSOEKNUMMER/APPLICATION NUMBER	LU/9404	
MEMO AAN/ TO :		
Director : Infrastructure Services (Traffic Engineer / Engineering Services / Electrical Services)		
Manager : Building Development Management		
Manager : Fire Services		
Manager: Spatial Planning / Heritage / Environment / Signage		
Manager: Health Department (Winelands Health)		
Manager: Community Services (Parks): <b>Albert Van Der Merwe</b>		
Manager: Property Management (P Smit)		
Community Development (Michelle Aalbers)		
Legal Services		
Manager: Local Economic Development		
Application	Application is made in terms of section 15(2)(a) of the Stellenbosch Municipal Land Use Planning By-Law, promulgated by notice number 354/2015, dated 20 October 2015, for the rezoning of Farm No. 29, Stellenbosch Division from <b>Agricultural Zone I</b> to Open <b>Space Zone II</b> for the establishment of a public cemetery and memorial park.	
Adres / Address	Farm Calcutta R304 Stellenbosch District	
Aansoek Datum Application Date	02 April 2019	
Aansoeker Applicant	CK Rumboll & Partners ( Jolandie linnemann)	
<p>Aangeheg vind u tersaaklike dokumentasie in verband met bogenoemde aansoek. Ten einde my in staat te stel om die aansoek aan die besluitnemingsowerheid vir oorweging voor te lê, word u versoek om my skriftelik van u kommentaar, indien enige, te voorsien. Onderskei asseblief tussen algemene kommentaar op die meriete van die aansoek en enige voorwaardes wat u departement wil opleë indien die aansoek goedgekeur word.</p> <p>Attached please find the relevant documentation regarding the abovementioned application. Kindly furnish me with your written comment, if any, in order to enable me to submit the application to the decision making authority for consideration. Please differentiate between general comment on the merits of the application and any conditions that your department wishes to impose should the application be approved.</p> <p>Geliewe die memorandum <u>per hand</u> aan my terug te besorg voor of op: <b>21 September 2019</b> Please <u>hand deliver</u> the memorandum to me on or before : <b>21 September 2019</b></p>		
<b>C Petersen</b> <b>For DIRECTOR: PLANNING AND ECONOMIC DEVELOPMENT</b> <b>ALGEMENE KOMMENTAAR / GENERAL COMMENT:</b> <i>No comment or mention at park</i>		
<b>VOORWAARDES/CONDITIONS:</b> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> FILE NR: <i>EBR Farm 29 SB</i>  SCAN-NR:  COLLABORATOR NR: <i>689269</i> </div>		
<i>halsels</i> HANDTEKENING / SIGNATURE	<i>29/08/2019</i> DATUM / DATE	

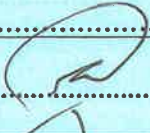


**ANNEXURE M**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FROM THE MANAGER: BUILDING  
MANAGEMENT**

## INTERDEPARTMENTAL CIRCULATION FORM

LêER VERW/ FILE REF	Farm 29, Stellenbosch	DATE: 21 August 2019			
AANSOEKNUMMER/APPLICATION NUMBER	LU/9404				
MEMO AAN/ TO :					
Director : Infrastructure Services (Traffic Engineer / Engineering Services / Electrical Services)					
Manager : Building Development Management					
Manager : Fire Services					
Manager: Spatial Planning / Heritage / Environment / Signage					
Manager: Health Department (Winelands Health)					
Manager: Community Services (Parks): <b>Albert Van Der Merwe</b>					
Manager: Property Management (P Smit)					
Community Development (Michelle Aalbers)					
Legal Services					
Manager: Local Economic Development					
Application	Application is made in terms of section 15(2)(a) of the Stellenbosch Municipal Land Use Planning By-Law, promulgated by notice number 354/2015, dated 20 October 2015, for the rezoning of Farm No. 29, Stellenbosch Division from <b>Agricultural Zone I</b> to Open <b>Space Zone II</b> for the establishment of a public cemetery and memorial park.				
Adres / Address	Farm Calcutta R304 Stellenbosch District				
Aansoek Datum Application Date	02 April 2019				
Aansoeker Applicant	CK Rumboll & Partners ( Jolandie linnemann)				
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<p><b>C Petersen</b> For DIRECTOR: PLANNING AND ECONOMIC DEVELOPMENT</p>					
ALGEMENE KOMMENTAAR / GENERAL COMMENT:					
<p>.....  <i>Part 5 The facilities must comply with SANS 10400  (Facilities for disable persons)</i>  .....</p>					
VOORWAARDES/CONDITIONS:					
<table border="1" style="width: 100%;"> <tr> <td>FILE NR: <i>Farm 29 SB</i></td> </tr> <tr> <td>SCAN NR:</td> </tr> <tr> <td>COLLABORATOR NR: <i>659271</i></td> </tr> </table>			FILE NR: <i>Farm 29 SB</i>	SCAN NR:	COLLABORATOR NR: <i>659271</i>
FILE NR: <i>Farm 29 SB</i>					
SCAN NR:					
COLLABORATOR NR: <i>659271</i>					
HANDTEKENING / SIGNATURE	 ..... <b>21/8/2019</b> ..... <b>DATUM / DATE</b>				

**ANNEXURE N**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FROM THE MANAGER: FIRE SERVICES**

INTERDEPARTMENTAL CIRCULATION FORM

LêER VERW/ FILE REF	Farm 29, Stellenbosch	DATE: 21 August 2019
AANSOEKNUMMER/APPLICATION NUMBER	LU/9404	
MEMO AAN/ TO :		
Director : Infrastructure Services (Traffic Engineer / Engineering Services / Electrical Services)		
Manager : Building Development Management		
Manager : Fire Services		
Manager: Spatial Planning / Heritage / Environment / Signage		
Manager: Health Department (Winelands Health)		
Manager: Community Services (Parks): Albert Van Der Merwe		
Manager: Property Management (P Smit)		
Community Development ( Michelle Aalbers)		
Legal Services		
Manager: Local Economic Development		

<b>Application</b>	Application is made in terms of section 15(2)(a) of the Stellenbosch Municipal Land Use Planning By-Law, promulgated by notice number 354/2015, dated 20 October 2015, for the rezoning of Farm No. 29, Stellenbosch Division from <b>Agricultural Zone I</b> to Open <b>Space Zone II</b> for the establishment of a public cemetery and memorial park.
<b>Adres / Address</b>	Farm Calcutta R304 Stellenbosch District
<b>Aansoek Datum / Application Date</b>	02 April 2019
<b>Aansoeker / Applicant</b>	CK Rumboll & Partners ( Jolandie linnemann)



Aangeheg vind u tersaaklike dokumentasie in verband met bogenoemde aansoek. Ten einde my in staat te stel om die aansoek aan die besluitnemingsowerheid vir oorweging voor te lê, word u versoek om my skriftelik van u kommentaar, indien enige, te voorsien. Onderskei asseblief tussen algemene kommentaar op die meriete van die aansoek en enige voorwaardes wat u departement wil opleë indien die aansoek goedgekeur word.

Attached please find the relevant documentation regarding the abovementioned application. Kindly furnish me with your written comment, if any, in order to enable me to submit the application to the decision making authority for consideration. Please differentiate between general comment on the merits of the application and any conditions that your department wishes to impose should the application be approved.

Geliewe die memorandum per hand aan my terug te besorg voor of op: **21 September 2019**  
Please hand deliver the memorandum to me on or before : **21 September 2019**

**C Petersen**  
For **DIRECTOR: PLANNING AND ECONOMIC DEVELOPMENT**  
**ALGEMENE KOMMENTAAR / GENERAL COMMENT:**

FILE NR:	
SCAN NR:	
COLLABORATOR NR:	660812

**VOORWAARDES/CONDITIONS:**  
Fire requirements will be given when plans are submitted to Council

<b>HANDTEKENING / SIGNATURE</b>	<b>DATUM / DATE</b>
	06/09/2019

**ANNEXURE O**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FROM THE HEALTH DEPARTMENT (CAPE  
WINELANDS)**

File 8

## INTERDEPARTMENTAL CIRCULATION FORM

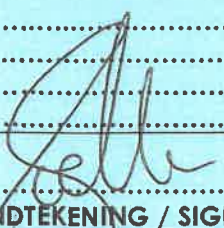
LêER VERW/ FILE REF	Farm 29, Stellenbosch	DATE: 21 August 2019
AANSOEKNUMMER/APPLICATION NUMBER	LU/9404	
MEMO AAN/ TO :		
	Director : Infrastructure Services (Traffic Engineer / Engineering Services / Electrical Services)	
	Manager : Building Development Management	
	Manager : Fire Services	
	Manager: Spatial Planning / Heritage / Environment / Signage	
	Manager: Health Department (Winelands Health)	
	Manager: Community Services (Parks): Albert Van Der Merwe	
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	Community Development (Michelle Aalbers)	
	Legal Services	
	Manager: Local Economic Development	
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<b>Adres / Address</b>	Farm Calcutta R304 Stellenbosch District	
<b>Aansoek Datum / Application Date</b>	02 April 2019	
<b>Aansoeker / Applicant</b>	CK Rumboll & Partners ( Jolandie linnemann)	
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<p>C Petersen For DIRECTOR: PLANNING AND ECONOMIC DEVELOPMENT ALGEMENE KOMMENTAAR / GENERAL COMMENT:</p>		<p>FILE NR: op: <b>21 September 2019</b></p> <p>SCAN NR: <b>F29 S</b></p> <p>COLLABORATOR NR: <b>662999</b></p>
<p><i>This application is recommended from an environmental health perspective.</i></p>		
<p>VOORWAARDES/CONDITIONS:</p>		
<p><i>SEA</i></p> <p>HANDTEKENING / SIGNATURE</p>		<p><i>26/09/2019</i></p> <p>DATUM / DATE</p>

**ANNEXURE P**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FROM THE MANAGER: COMMUNITY  
SERVICES (PARKS)**

## INTERDEPARTMENTAL CIRCULATION FORM

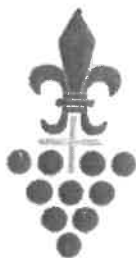
LêER VERW/ FILE REF	Farm 29, Stellenbosch	DATE: 21 August 2019						
AANSOEKNUMMER/APPLICATION NUMBER	LU/9404							
MEMO AAN/ TO :								
Director : Infrastructure Services (Traffic Engineer / Engineering Services / Electrical Services)								
Manager : Building Development Management								
Manager : Fire Services								
Manager: Spatial Planning / Heritage / Environment / Signage								
Manager: Health Department (Winelands Health)								
Manager: Community Services (Parks) : <b>Albert Van Der Merwe</b>								
Manager: Property Management (P Smit)								
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Legal Services								
Manager: Local Economic Development								
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<b>Adres / Address</b>	Farm Calcutta R304 Stellenbosch District							
<b>Aansoek Datum / Application Date</b>	02 April 2019							
<b>Aansoeker / Applicant</b>	CK Rumboll & Partners ( Jolandie linnemann)							
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<b>C Petersen</b> For DIRECTOR: PLANNING AND ECONOMIC DEVELOPMENT	<table border="1"> <tr> <td>FILE NR:</td> <td></td> </tr> <tr> <td>SCAN NR:</td> <td>F 29 3</td> </tr> <tr> <td>COLLABORATOR NR:</td> <td>66.35.24</td> </tr> </table>		FILE NR:		SCAN NR:	F 29 3	COLLABORATOR NR:	66.35.24
FILE NR:								
SCAN NR:	F 29 3							
COLLABORATOR NR:	66.35.24							
<b>ALGEMENE KOMMENTAAR / GENERAL COMMENT:</b>	<p>APPLICATION SUPPORTED</p>							
<b>VOORWAARDES/CONDITIONS:</b>								
<b>HANDTEKENING / SIGNATURE</b>	<b>DATUM / DATE</b>							
	01/10/2019							



**ANNEXURE Q**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FROM THE MANAGER: SPATIAL PLANNING**



# STELLENBOSCH

STELLENBOSCH • PNIEL • FRANSCHHOEK

MUNICIPALITY • UMASIPALA • MUNISIPALITEIT

*Spatial Planning, Heritage and Environment*

To : Head: Customer Interface & Administration  
 From : Manager: Spatial Planning  
 Reference: Farm 29, Culcuttabos  
 Date : 14 November 2019  
 Re : Application for rezoning of Farm 29 from agricultural to Open Space Zone II, Cemetery



I refer to your request for comment on the above application.

The application is for the rezoning of Farm 29, Culcuttabos from Agricultural Zone I the Open Space Zone II for purposes of a regional cemetery.

CK Rumboll and Partners were appointed by the Stellenbosch municipality in order to identify rezone and prepare land for the establishment of a regional cemetery. This property is one of two land parcels identified by the study and approved by the municipality as appropriate land to investigate further for this purpose.

The land is located adjacent to the R304 north of Koelenhof and is more or less 40 hectares in extent. The site is extensively degraded and heavily invested with Port Jackson and Blue Gum trees.

The proposed cemetery will be set back from the R304 so as to respect the visual character of the area since it is located within a rural area and along a declared scenic route. The perennial stream will be rehabilitated. The intention is to develop a park-like landscape rather than a conventional cemetery. The proposed development will facilitate the introduction of indigenous vegetation in the landscape areas. Only approximately 17 ha of the total 40 ha will be utilized for the cemetery. An Environmental Impact Assessment was undertaken and authorization obtained.

Various other specialist studies were undertaken and concluded in preparation for the plan for the new cemetery and include a social impact assessment, archaeological assessment, biodiversity assessment, botanical statement, freshwater assessment, geohydrological assessment, geotechnical assessment, heritage assessment, paleontological study, visual impact assessment and social-economic study. The findings of the studies were taken into account.

FILE NR:

SCAN NR:

COLLABORATOR NR:

FILE NR: [REDACTED]  
 SCAN NR: F 295  
 COLLABORATOR NR: 669079

Access to the cemetery will be obtained via a new municipal road to the north of the site which road will obtain access from the R304. A traffic Impact Study was concluded for the new intersection.

## DISCUSSION

Stellenbosch is fast running out of burial space. A similar threat is experienced in the neighboring municipalities. Despite the available alternatives, conventional burial and funeral practices are still the norm and preferred option. The main challenge facing municipalities today is striking a balance between spiritual, religious and cultural practices.

Besides allocating areas for traditional burial methods and a wall of remembrance, a garden of remembrance in the form of an extensively landscaped park will be created. The concept involves establishing a memorial park set in a landscaped environment providing a peaceful, tranquil, dignified and safe environment in which families can put to rest their loved ones, rather than just a cemetery.

The area falls outside the urban edge and within an agricultural zone with a dominant rural character. Cemeteries need not be developed within urban areas but can effectively be provided in the hinterland as long as the format of the cemetery respects the rural setting.

In terms of the Heritage Inventory and Management Plan for Stellenbosch, Culcuttabos is located in a Grade IIIb (Sensitivity 5) landscape due to its significance as outspan area. The area of most significance is located to the south of the subject property. The impact of the cemetery development will be significant in the sense that the land use will change from woodland (infested with alien vegetation) to that of cemetery. However, the concept plan was sensitively done to allow for the conservation of the southern outspan site in the overall framework. Mitigation measures will adequately address all concerns. The end result will be a sensitively landscape park accessible to the public.

Although the R304 is not a scenic route, visibility will be an issue to take cognizance of. In this regard a visual impact assessment was undertaken which study proposed mitigating measures to reduce the visual impact.

This department is satisfied that the rezoning of Culcuttabos from Agricultural Zone I to Open Space Zone II in order to allow for a cemetery and memorial park was thoroughly investigate and is aligned with spatial planning policy. Its location within the rural land between urban settlements is supported form a long term planning perspective and the cemetery plan was undertaken with a view to create a landscape park that would contribute to the rural quality of the area.

The application is thus support.

#### **RECOMMENDATIONS**

1. That the mitigating recommendation as contained in the visual impact assessment be implemented;
2. That the mitigating measures contained in the Heritage Impact assessment be implemented.



**BJG de la Bat**  
**MANAGER: SPATIAL PLANNING**

**ANNEXURE R**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**COMMENT FROM THE DIRECTOR: ENGINEERING  
SERVICES**



**STELLENBOSCH MUNICIPALITY**  
STELLENBOSCH·PNIEL·FRANSCHHOEK

# MEMORANDUM

**DIREKTEUR: INGENIEURSDIENSTE**  
**DIRECTORATE: ENGINEERING SERVICES**

**To ▫ Aan:** Director: Planning + Economic Development  
**Att Aandag** N Katts  
**From ▫ Van:** Abdullah Daniels (Development)  
**Date ▫ Datum:** 18 October 2019  
**Our Ref ▫ Ons Verw:** Civil Lu 1896  
**Re ▫ Insake:** Farm 29, Rezoning.

The application is for the following items:

- i. Rezoning of Farm No 29, Stellenbosch from Agriculture zone I to Open Space zone II for the establishment of a public cemetery and memorial park.

Comments from the Transport, Roads and Stormwater, Water Services, Traffic Engineering and Development Departments will be reflected in this memo and is to be regarded as development conditions to be reflected in the land-use approval.

The application is **recommended** for approval, subject to the following conditions:

## 1. Waste Water and Sewage

- 1.1. A technical report by a suitably qualified professional, regarding the "package plant" proposed in your letter must be submitted for approval, prior to the acceptance of any building plans, and prior to the installation thereof.

**2. Water**

- 2.1 The source of potable water indicated in this application is borehole water.
- 2.2 The quality of the water stored and distributed by the owner has to comply with SANS 241 Drinking Water Quality Standards. Current proof of compliance must be available on request.

**3. Solid Waste**

- 3.1 Please note: Solid waste must be removed from the site to a lawful solid waste disposal site in accordance with the requirements of section 26 of the National Environmental Management Waste Act 2008 (Act 59 of 2008).

**4. Roads**

- 4.1 Please refer the application to the District Roads Engineer for comment. Any conditions set by the District Roads Engineer will be applicable.
- 4.2 Prior to commencement of any demolition / construction work, a traffic accommodation plan for the surrounding roads must be submitted to the Directorate: Infrastructure Services for approval.

**5. Stormwater Management**

- 5.1 The geometric design of the roads, parking area and grave layout must ensure that no trapped low-points are created with regard to stormwater management.

**6. Electrical**

6.1 See annexure A for electrical comments.



**ABDULLAH DANIELS**

**PRINCIPAL TECHNICIAN: DEVELOPMENT (INFRASTRUCTURE SERVICES).**

W:\2.0 DEVELOPMENT\00 Developments\1896 (AD) Farm 29, Calcutta, cemetery\1896 (AD) Farm 29, Calcutta, cemetery.doc



**ANNEXURE S**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**RESPONSE ON COMMENT RECEIVED**

**Jolandie Linneman**

**From:** Francois Malan [fmalan@simonsig.co.za]

**Sent:** 11 October 2019 10:33 AM

**To:** jolandie@rumboll.co.za

**Cc:** Francois Malan

**Subject:** Hersonerig Calcutta plaas: LU/9404

Beste Jolandie

Application for Rezoning: Farm Calcutta Nr 29

Dankie vir die volledige verslag wat ek ontvang het rakende die aansoek om hersonerig van Culcutta bos vir die ontwikkeling van 'n begraafplaas.

Ons het in beginsel nie 'n beswaar teen die voorgenome hersonerig, maar wil graag twee aspekte uitlig.

1. Die ontstaan van die naam 'Culcutta' word nie aangespreek deur die spesialiste in Artikel 8: 8.1 Jonathan Kaplan of 8.7 Bruce Eitzen  
Dis welbekend dat die Koelenhof area gedurende die Anglo Boere oorlog gebruik is as 'n perde voorsieningsplaas. Dit het bekend gestaan as die Koelenhof Remount Camp. Daar is deeglike navorsingstukke hieroor gepubliseer deur die Universiteit Stellenbosch. Gedurende hierdie periode is heelwat Indiese personeel deur die Britse magte gebruik om die perde te versorg. Daar is ook 'n mondelinge getuienis dat van die Indiese personeel daar begrawe is. Ek sal graag wil weet wat is die oorsprong van die naam, Calcutta en waarna verwys dit. Ek dink dit is belangrik vir al met die oog op 'n toekomstige naam van die begraafplaas. Gaan dit die Calcutta begraafplaas wees of moontlik die Uitspan begraafplaas?
2. Nêrens word melding gemaak wat die hoogte van die geboue of "chapel" is nie. In die verslag word verwys na 'n "chapel". Ek wil aansluit by die "Visual impact Assessment" 8.9 van Bruce Eitzen dat die beplande geboue moet inpas by die landelike omgewing aangesien die omliggende omgewing bestaan uit wingerde en veld. Ons sal nie 'n kerktoring wil sien nie. Die R304 is die hoof toegangsroete na die Kaapse wynlande en die begin die Stellenbosch wynroete. Die beplande ontwikkeling moet nog steeds inpas by 'n landelike visuele gevoel.




Groete  
Francois



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**Jolandie Linneman**

---

**From:** Jolandie Linneman [jolandie@rumboll.co.za]

**Sent:** 14 October 2019 02:41 PM

**To:** 'Francois Malan'

**Subject:** RE: Hersonerig Calcutta plaas: LU/9404

Goeie dag Mnr Malan

U e-pos gedateer 11 Oktober 2019 het betrekking.

Ek het navraag gedoen by Stellenbosch Munisipaliteit en is die terugvoer as volg.

1. Baie dankie vir die agtergrond kennis wat u gedeel het.  
Die naam van die voorgestelde begraafplaas/gedenkpark is nie vas nie. Daar kan met die vestiging van die begraafplaas/gedenkpark oor 'n paar opsies besin word wat heel waarskynlik deur 'n publieke deelname proses sal gaan.
2. Met die vestiging van die 'chapel' sal die bestaande argitektuur en landskap in ag geneem word. Die voorstel sal inskakel by die omliggende landelike omgewing soos voorgestel in Mnr Eitzen se verslag. Finale voorstelle sal eers voorgele word indien alle goedkeurings in plek is.

Ek vertrou u vind bogenoemde in orde. Laat weet gerus indien u meer inligting verlang.

Vriendelike groete

Jolandie Linnemann

Stads- en Streekbeplanner/Town and Regional Planner Pr. Pln - A/206/2010

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---

**From:** Francois Malan [mailto:fmalan@simonsig.co.za]

**Sent:** 11 October 2019 10:33 AM

**To:** jolandie@rumboll.co.za

**Cc:** Francois Malan

**Subject:** Hersonerig Calcutta plaas: LU/9404

Beste Jolandie

Application for Rezoning: Farm Calcutta Nr 29

Dankie vir die volledige verslag wat ek ontvang het rakende die aansoek om hersonerig van Culcutta bos vir die ontwikkeling van 'n begraafplaas.

Ons het in beginsel nie 'n beswaar teen die voorgenome hersonerig, maar wil graag twee aspekte uitlig.

1. Die ontstaan van die naam 'Culcutta' word nie aangespreek deur die spesialis in Artikel 8: 8.1 Jonathan Kaplan of 8.7 Bruce Eitzen  
Dis welbekend dat die Koelenhof area gedurende die Anglo Boere oorlog gebruik is as 'n perde voorsieningsplaas. Dit het bekend gestaan as die Koelenhof Remount Camp. Daar is deeglike

2019/10/15

**Jolandie Linneman**

**From:** Albert van der Merwe [Albert.vanderMerwe@stellenbosch.gov.za]  
**Sent:** 20 September 2019 01:57 PM  
**To:** Schalk Van der Merwe  
**Cc:** jolandie@rumboll.co.za; Nazeema Mohamed  
**Subject:** RE: Culcatta Bos

Schalk

Op die stadium is dit onmoontlik om 'n koste te voorsien vir die ontwikkeling van 'n nuwe begraafplaas, asook die onderhoudskoste. Wat betref die ontwikkeling stem ek saam met Nazeema se aangehegde epos se inhoud. Ons sal eers 'n werklike koste kan hê nadat ons 'n tender proses deurloop het vir al die komponente, soos genoem deur Nazeema in haar epos. Ons het wel binnekaort 'n omheingstender inplek en sal dus die syfers kan gebruik om 'n benaderde bedrag te kry. Wat betref die installering van ingenieurskomponente is 'n beraming eers moontlik nadat spesifikasies en finale uitleg van begraafplaas vas gestel is. Wat betref die onderhoud neem die onderhoud toe soos wat die aantal grafte vermeerder.

### Winners of the Arbor City Awards 2014 & 2017 Local Municipality Category

*Kind Regards / Vriendelike Groete*



**Albert Van Der Merwe**

Senior Bestuurder:  
 Gemeenskapsdienste  
 Senior Manager:  
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**STELLENBOSCH**  
 ZEELLENBOSCH • FRIEDLAND • FRANSCHHOEK  
 MUNICIPALITEIT • KWAZULU-NATAL • MUNICIPALITY



#### About Stellenbosch Municipality

Our mission is to deliver cost-effective services that will provide the most enabling environment for civil and corporate citizens. Our head office is at Town House Complex, Plein Street, Stellenbosch, 7600, South Africa. For more information about Stellenbosch Municipality, please call +2721-808-8111, or visit [www.stellenbosch.gov.za](http://www.stellenbosch.gov.za)

#### Disclaimer:

The information contained in this communication from [albert.vandermerwe@stellenbosch.gov.za](mailto:albert.vandermerwe@stellenbosch.gov.za) sent at 2019-09-20 13:57:13 is confidential and may be legally privileged. It is intended solely for use by jolandie@rumboll.co.za and others authorized to receive it. If you are not jolandie@rumboll.co.za you are hereby notified that any disclosure, copying, distribution or taking action in reliance of the contents of this information is strictly prohibited and may be unlawful.

2019/09/23

**ANNEXURE T**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**ENGINEERING SERVICES REPORT**

**STELLENBOSCH MUNICIPALITY****Stellenbosch Regional Cemetery: Calcutta : SERVICES REPORT**

Ref. Revision 1

March 2019

**COMPILED FOR:**

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## STELLENBOSCH MUNICIPALITY

### SYNOPSIS

The purpose of this services report is to provide detail on the type of development to be provided, as well as providing a design philosophy with regards to the management of storm water and sewage from the development and provision of water and roads to the development.

#### Disclaimer

*This report has been prepared on behalf of and for the exclusive use of Stellenbosch Municipality, and is subject to and issued in accordance with the agreement between Stellenbosch Municipality and iX engineers (Pty) Ltd. Stellenbosch Municipality and iX engineers (Pty) Ltd accepts no liability or responsibility whatsoever for it in respect of any use of or reliance upon this report by any third party.*

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#### PROJECT 000/00000/0 – iX engineers FORMAL REPORT TEMPLATE

REV	DESCRIPTION	ORIG	REVIEW	iX engineers APPROVAL	DATE	CLIENT APPROVAL	DATE
A	Issued for internal review	Author	A Reviewer	N/A	2017-....	N/A	

**STELLENBOSCH MUNICIPALITY**
**Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT**
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### APPENDIX 1 - MINIMUM REQUIREMENTS FOR ROAD CROSS SECTIONS

## STELLENBOSCH MUNICIPALITY

### Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT

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#### 1. PURPOSE OF REPORT

The purpose of this report is to summarise the status of all existing services, as well as to provide standards of the services proposed for the development of a regional cemetery for the Stellenbosch Municipality.

#### 2. LOCATION, TOPOGRAPHY AND LAYOUT

A site on the remainder of Farm Calcutta, No 29, has been identified as a regional cemetery site .The site is approximately 39 ha in size and is situated 10 km north of Stellenbosch adjacent the Stellenbosch Road, R304.

The area adjacent the site proposed for the cemetery consists mainly of vineyards. There are a number a farm dams upstream of the proposed terrain. These dams' effects the normal drainage pattern of the stream found on the western boundary of the terrain. This watercourse is therefore mainly dry and feeds into the Plankenburg River .The site itself is covered by alien plant species and a phase 2 geotechnical investigation of Calcutta indicates that the soils seems firm and areas earmarked for graves can be easily excavated. Initial indications are that the material found on site consists of clay and loam. In the northern areas of the terrain, sand can be found to a depth of 700mm, with underlying calcrete on top of clay and sandstone in access of 2,0m The material found on site has low permeability and hence will prevent the movement of underground water.

The yield of groundwater will be low as the site is underlain by shale, but this will have to be verified. Testing of water from boreholes adjacent the terrain proposed for development, indicates poor brak water quality, which could influence the usage of the water from a borehole. It would however be possible to construct a dam on site or downstream of the site from surface runoff.

The existing topography for the site of Calcutta is predominantly in a westerly direction with even slopes towards the R304 Stellenbosch Road. The fall from north to south is minimal towards the Plankenburg River..

A Land-surveyor had been appointed by Stellenbosch Municipality to do a topographical survey of the site to confirm drainage patterns on site. Topographical surveys will be utilized to design possible earthworks for the development, as well as provision of civil engineering services.

The town planners have produced a draft layout plan for the development which consist of different zones catering for a memorial park centre, chapel, offices workshops, different types of graves and informal zones. This preliminary layout plan is being used to propose the necessary services to be provided.

**STELLENBOSCH MUNICIPALITY****Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT**

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**3. STREET LAYOUT AND DESIGN**

Preliminary investigations indicate that the site is mainly overlain by sands, clay and loam material on a layer of shale. Clay material on site could be as a result of the construction of the R304 Stellenbosch Road. Geotechnical investigations have been performed to verify underground conditions and will be used to determine the foundations for roads and buildings proposed. Imported material will be required to provide proper pavement structures to accommodate traffic loading and meet the minimum design standards of Stellenbosch Municipality.

In order to meet minimum drainage requirements and to provide areas for buildings, burial zones and gathering spaces, bulk engineered earthworks will be unavoidable, however it is foreseen at this stage that the current slopes towards the west and south will be maintained in order to minimize on the amount of earthworks to be performed.

The street layout proposed for the facility will consist of an intersection with the R304 Stellenbosch Road, as indicated on the layout plan in the annexures, with an access road towards the entrance of the cemetery facility. Proper access control to the cemetery is however essential and will be a requirement from the Department of Transport. The positioning of the intersection will be crucial, in order to perform turning manoeuvres into and from the terrain safely. The current speed on the R304 is 100km/h with required shoulder sight distances of 220m. It is envisaged that the intersection be provided at km 50.58 km as provided in the Arterial Management Plan(AMP) for Main Road 174( R304) document. In this position the R304 is situated within a 50 m road reserve and consist of a single lane per direction. The road width is 3, 7 m with a 2, 0 m shoulder in each direction.

The AMP for Main Road 174( R304) proposes the road to be duelled due to the traffic encountered on this road. This report furthermore proposes that existing intersections be consolidated in order to provide the necessary spacing of intersections. Future planning by the department of Transport will play a significant role in the planning strategy for access onto R304. Alternatives for the intersection required would include a roundabout with consolidation of access to residence in the vicinity of the cemetery location, as well as a normal at grade intersection with the necessary turning and acceleration lanes from and to the proposed facility. A Traffic Engineer has been appointed to facilitate the process of approval from the Department of Transport in order to obtain the necessary approvals.

**STELLENBOSCH MUNICIPALITY**
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From the intersection, an access road will be provided to the entrance of the cemetery, leading to the entrance and parking area for visitors. The detail of road to be provided later in this report. A culvert structure to be provided where the proposed road crosses the stream.

Internal roads will be provided which will provide access to the memorial park, offices, workshops and offices. A combination of paved areas is proposed for esthetical purposes. The necessity of paved parking areas will be investigated in order to accommodate the turning movements of busses in the parking area. The main access road can be provided with a tarred surface with barrier kerbs and a channel alongside for transportation of the storm water to the irrigation reservoir.

#### **4. STORMWATER**

An existing stream transverses the proposed terrain for development from north to south on the western boundary. This stream feeds into the Plankenburg River which connects to the Eerste River. Only in the rainy season this stream will transport storm water, as existing dams on adjacent farms cut off the flow to the stream. Allowance will however be made to protect the stream and the 32 m ecological zone will be maintained.

It is envisaged that as part of the facility, the wetland will be rehabilitated, with the creation of areas where parklands are created forming a green zone within the vicinity of the stream.

The overall philosophy that will be followed for the development is to transport storm water from hardened surfaces (roofs of buildings and roads) to a storm water retention facility where storm water can be polished and used for irrigation of trees, vineyards and the like. Storm water from outside the terrain for the development, will be incorporated into the storm water reticulation system leading to the attenuation facility. The option of providing permeable paving will be investigated in order to transport storm water from the development. It is envisaged that any overflow from the attenuation facility could be taken to the stream on the western boundary. This is however very unlikely, as an additional borehole is planned to provide water for the development. The provision of a cut off trench facility on the north and eastern boundaries will be investigated during the design phase.

Surface storm water from the areas earmarked for graves and informal areas will be taken via swales or rock lines channels to the storm water reticulation system in order to feed into the attenuation facility.

Subsurface drainage will have to be provided to minimise the potential negative effects of a possible high-water table in winter months. Soil tests and profiling of the terrain has been performed to establish the exact

## STELLENBOSCH MUNICIPALITY

### Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT

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condition of the in-situ material and water table. The design of pavement structures and other amenities will take cognizance of the prevailing geotechnical conditions.

#### 5. SEWER RETICULATION

There is currently no existing sewer network services on the terrain or any municipal reticulation system close to the proposed site for development. It is therefore proposed that a package plant be constructed on site which can treat the effluent from the offices/toilets. It is furthermore proposed that the sewer treatment occurs upstream of the irrigation reservoir which can then contribute to the capacity to irrigate the green areas. We do not foresee that the treated effluent will contribute a lot to the source of irrigation water.

A reticulation underground system will be provided, leading from wet areas to the treatment plan, via sewer pipes and manholes. It is foreseen that a network of 160 mm piping will be adequate with smaller 110mm individual connections to different buildings.

#### 6. WATER RETICULATION

Due to the fact that no water network is available on site and that no potable water from the municipality is available, it is proposed that a borehole(s) be provided to provide water to the development. Investigations will however be required to determine the position(s) of the borehole(s). Initial investigations indicated poor quality of water and the yield of 1 l/s could necessitate more than one borehole. During the investigation phase of the project, the detail of water provision will be finalized on.

From the boreholes, water will be pumped to the offices and toilets via an underground pipe system.

It is foreseen that a network of  $\varnothing$  110 /  $\varnothing$  160 mm main feed lines will be provide for the development. Analysis during the design stage, will however verify the required sizes of the water lines.

#### 7. GEOTECHNICAL

A comprehensive geotechnical site investigation has been carried out, with the objectives of fully determining site geotechnical conditions and facilitating the choice and design of foundations and surface beds for the planned structures. The findings of the geotechnical report will be used to determine the founding detail of the buildings and roads, as well as excavation detail for engineering services and backfill of trenches.



## STELLENBOSCH MUNICIPALITY

### Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT

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#### 8. TELKOM SERVICES

Telkom and other service providers will be approached with a layout of the development and will have the opportunity to provide a distribution system within the development. The necessary sleeves will be provided at street crossings.

#### 9. ELECTRICITY

The electricity supply authority for the development is Eskom. The required bulk electrical infrastructure strengthening/upgrades will be investigated and infrastructure will be proposed.

It is however envisaged that the provision of electricity from a solar system will be favoured. Provision of electricity by means of solar compared to the normal installation and maintenance costs of electricity from Eskom will be done. During the design phase, both options will be investigated and the most cost effective solution will be followed, taking into account safety and maintenance of the system.

**STELLENBOSCH MUNICIPALITY**
**Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT**


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**10. PROPOSED SERVICES**
**10.1 STREETS**
**10.1.1 Minimum Standards**

- Minimum longitudinal gradient: 0,5%.
- Cross-fall on streets must be 2,5 %.

**10.1.2 Road And Street Name Signage**

- All approved street name signs shall be cast in kerb type with white lettering on "Kingfisher blue" PVA background.
- All lettering to be 75 mm high, white on blue reflective background.
- All road markings must be repainted just before the end of the Defects Liability Period.

**10.1.3 Pavement Layers**

- Bituminous surface treatments in the form of Chip and Spray, slurry, Cape Seals or sand asphalt are not acceptable.
- Pavement layers shall be as per the attached table.
- Asphalt surfacing must be laid with a paver. Asphalt only to be considered for the main access road
- 80 mm Interlocking paving will be provided in the parking areas, as well as all load bearing areas.
- 60 mm paving will be provided for pedestrian areas/walkways.

**10.1.4 Verges**

The area adjacent the main access road shall be provided with a 75 mm thick gravel material (both sides of the road).

The remainder of the verge will be trimmed and shaped with the possibility of trees.

## STELLENBOSCH MUNICIPALITY

### Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT

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#### 10.1.5 Street Design Layout

The street layout will consist of the main access road with a parking area that leads to the gateways and pedestrian entrance. The main access route for the development will connect onto Main Road 174( R304).The intersection detail of providing a circle on Main Road 174 or a normal at grade intersection , is still to be finalized.

In the case of a normal intersection, the intersection will be designed in order to provide slip lanes and acceleration lanes, in order to provide safe in and out movement to and from the facility. Minimum stacking requirement will be followed as prescribed by the Department of Transport

## 10.2 STORMWATER AND SUBSURFACE DRAINAGE

### 10.2.1 Pipes

- Minimum pipe size to be OD 375 mm Ø.
- Pipes must be laid crown- to –crown.
- Spigot and socket pipes with rubber ring joints must be used. Interlocking joint pipes (Ogee) is not acceptable.
- Minimum gradients for pipelines must ensure self-cleansing velocity of at least 0,9 m/s and not exceed scour velocity of 3,5 m/s at full flows.
- Minimum cover to pipes to be generally 750 mm and at road intersections cover to be 1000 mm.
- Pipes to be positioned in front of the kerb due to the fact that space is limited in narrow reserve widths. The pipes must be positioned under the roadway.
- Pipes may not run “through” a catchpit. Pipes must be connected to catchpits by means of a manhole (situated in the roadway), except at the beginning of a stormwater line.
- uPVC to SABS 1601, “Corflo” or similar with smooth internal bore with holes or slots, complying with the requirements of SABS 791 shall be used in subsurface drains.
- Sausage and fin type subsoil drains are not permitted.



## STELLENBOSCH MUNICIPALITY

### Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT

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- The drainage medium to be 9.5 mm stone complying with SABS 1083.

#### 10.2.2 Manholes/Catchpits

- Manholes to be standard brick manholes with precast top slabs, with calcamite step irons placed at 300 mm c/c below manhole opening. Alternatively, precast ring type manholes may be used (minimum  $\varnothing$  1050 mm).
- Catchpits to be side inlet kerb type with precast concrete cover and slab. Full benching shall be constructed throughout the catchpit. Details as per Stellenbosch Municipality
- No junction boxes will be allowed in stormwater lines. Catchpit positions will be determined from run-off calculations and financial implications.
- Inlets may not be positioned on bellmouth radii.
- Manhole cover and frames to be SG Iron (ductile iron), tipe 2A, GJ rotating wedge lock system.
- All kerb inlets to be "stirling" type, galvanised metal hinged cover and frames, for single and double inlets.

#### 10.2.3 Retention Facilities

It is proposed that a storm water retention facility be used for attenuation of storm water.

### 10.3 FOUL SEWER

#### 10.3.1 Minimum Design Criteria

- Minimum gradient for pipelines must ensure a minimum velocity of 0,7 m/s.
- Minimum acceptable starting gradient for 100/110 mm  $\varnothing$  = 1:100 with a limiting gradient of 1:180 for 150/160 mm  $\varnothing$  pipes. Where possible, 1:80 gradients will be used at the start of all sewer lines.
- Minimum cover to pipes to be 1 000 mm.
- Minimum building connection depth to be generally 1,0 m (invert level to lowest ground level on premises) and where topography requires, 80 % of the premises must be able to drain towards the connection.

## STELLENBOSCH MUNICIPALITY

### Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT

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#### 10.3.2 Pipes

- Pipes to be positioned in the middle of one of the carriageways.
- Minimum pipe size for collecting sewers to be 150/160 mm.
- Minimum pipe size for building connection to be 100/110 mm.
- The following pipes may be used:
  - Bitumen dipped Fibre Cement – series 4 pipes with Triplex couplings
  - Class 34 heavy duty uPVC

#### 10.3.3 Manholes

- Manholes to be
  - Dolomitic precast concrete rings
  - Fibre Cement manholes (full resistance to flotation provided)
  - Brick manholes (wall must be plastered internally)
- Manhole cover and frames to be SG Iron (duct tile iron), type 2A, GJ rotating wedge lock system to EN 124 D400.
- Manholes to be constructed as per details of Stellenbosch Municipality, Water Services.
- All manholes to be provided with calcamite (or polypropylene) step irons.
- Maximum spacing between manholes to be 90 m. (according to Stellenbosch specifications).
- Maximum chimney height may not exceed 400 mm.
-

**STELLENBOSCH MUNICIPALITY**
**Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT**


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**10.3.4 General**

- All amenities with wet areas to be provided with water and sewer connections.
- All manholes to be water tight.
- Double connections will be allowed terminating with an endcap.. Connections to be visible and clearly marked.
- Rodding eyes to be provided with split sewer connections.

**10.4 WATER**
**10.4.1 Minimum Design Criteria**

- Minimum cover to pipes shall be 900 mm, with maximum 1000 mm.
- Connection for buildings to be laid to cross roadways with a minimum cover of 800 mm terminating 1,0 m inside the boundary at a depth of 400 mm.

**10.4.2 Pipes (Standard specifications for uPVC pipes and pressure bends and cast iron fittings and specials Stellenbosch Municipal standards shall apply)**

- Minimum pipe size to be 110 mm Ø.
- uPVC Class 12 heavy duty pipes to be used.
- Pipes generally to be positioned 1,0 m off the road reserve boundary.

**10.4.3 Valves (Standard specification for gate valves Stellenbosch Municipal standards shall apply)**

- Isolating valves should be provided to ensure that not more than 4 valves must be closed to isolate any section.
- Valves to be positioned opposite splays and where possible outside paved areas.
- Spindle top to be maximum 450 mm below beltoby cover.

## STELLENBOSCH MUNICIPALITY

### Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT

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- Valves to be clearly marked and visible.

#### 10.4.4 Fire Hydrants

- Fire hydrants to be pillar type, fitted with tamper proof quick coupling type hydrant outlets, painted yellow.
- All fire hydrants shall be 65 mm diameter (internal) Fire hydrants shall be positioned such that the spacing does not exceed 180 m, and where possible care must be taken not to place them in front of driveways.
- Fire hydrants are to be anti clockwise closing – Ainsworth RSV type with London round thread” with loose cap and securing chain.
- Fire hydrants to be placed on high/low points and at pipe ends in cul-de-sac roads.
- Hydrant outlet to be between 400 and 600 mm below hydrant cover.
- Hydrant chambers to be in accordance with Drawing W2.
- Hydrant covers shall be ductile iron conforming to EN 124 and painted with yellow oil paint. Covers to be secured to the frame with a galvanised chain or cable.

#### 10.4.5 Connections to Buildings

- Building connections shall be installed according to all wet service areas of buildings
- All water connection pipes to be HDPE PE 100 PN16 pipes.
- Saddles must be ductile / cast iron, secured with stainless steel bolts and nuts, and wrapped in “Denso” tape or similar approved.
- Single connection to be minimum 20 mm nominal.
- Double connections to be minimum 22 mm nominal  $\varnothing$  splitting to 2 x 20 mm nominal diameter connection.
- All connections to be clearly marked on kerb by a cutting slot. The slot must be painted with an approved paint.

#### 10.4.6 General

## STELLENBOSCH MUNICIPALITY

### Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT

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- Valve cover and frame to be painted King blue with a 200 mm wide blue strip painted on the kerb face.
- Hydrant cover and frame to be painted yellow with a 200 mm wide yellow strip painted on the kerb face.
- Valve and hydrant chambers to be constructed as per Stellenbosch Municipal standards.

#### 10.5 ELECTRICAL

All electrical infrastructure will be designed and installed in order to provide electricity to buildings and other amenities such as pump rooms and guard houses. The terrain for the development is within the Escom Provision Area and the option of connecting to Escom power will be investigated. It is however envisaged that a solar system and/or wind turbine system be provided in order to provide electricity to the development.

During winter months sunlight might necessitate the introduction of a wind turbine to provide electricity. The cost of this installation will be compared to the rates from Escom as a supplier and installation costs. The position of the closest Escom connecting point will contribute to additional costs, if connecting electrical lines need to be established. During the design phase of the electrical distribution network, both options will be investigated.

#### 10.6 RESOURCE EFFICIENCY

The proposed development will address, inter alia, water, energy and resource demand management and efficiency measures to ensure that all devices and fittings are energy and water efficient, including, but not limited to the following:

- All toilets will have interruptible flush mechanisms, or the cistern will be supplied with a fitted weight to interrupt the flow.
- Dual flush toilet cisterns.
- All taps will include an aerator to reduce the flow of water to 6 litres / minute.
- Shower heads will have restrictor or aerators to reduce water flow to 10 litres / minute.
- Energy saving light bulbs such as CFL's and LED's will be installed instead of incandescent bulbs.
- Outdoor lighting will be restricted to a minimum.

**STELLENBOSCH MUNICIPALITY**
**Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT**


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- Rain water will be harvested from roofs and taken to the irrigation reservoir.
- Adequate thermal insulation will be provided in roofs.
- Provision for installation of future solar geysers will be made.

**10.7 CABLE DUCTING**

Marking of cable ducting will be as follows:

- Communication ducts
  - 5mm thick T, cut out on kerb and painted green. Draw wire attached to a wooden marker with a 200 mm green painted top.
- Electrical ducts
  - 5mm thick V, cut out on kerb and painted red. 2,5mm galvanised steel draw wire attached to a wooden marker with a 200 mm red painted top, end sealed with polyurethane plugs or double layer of warning tape bound with wire.
- Valve
  - Beltoby to be painted blue with 5 mm wide V cut on kerb and 250 mm wide blue strip painted on kerb directly opposite valve.
- Hydrant
  - Cover to be painted yellow with standard FH marking as per SARTSM marked on road surface directly opposite hydrant.



**STELLENBOSCH MUNICIPALITY**

**Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT**

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## **Appendix 1 - Minimum Requirements for Road Cross Sections**

**STELLENBOSCH MUNICIPALITY**

**Stellenbosch Regional Cemetery: Calcutta: SERVICES REPORT**

**TABLE 1: MINIMUM REQUIREMENTS FOR ROAD CROSS SECTIONS**

Road class	Function	Road reserve width	Blacktop width	Camber/crossfall	Kerb type	Pavement layers	Surfacing	Minimum bellmouth radius
4	Main access	N/A m	6,5 m	Cross fall	BK2 + C1	150 mm G4 basecourse 150 mm G5 subbase 150 mm G7 selected	40 mm premix	10 m
4	Internal Roads	N/A	5,0 m	Cross fall	BK2 + C1	150 mm C4 basecourse 150 mm G5 subbase 150 mm G7 selected	80 mm pavers	10 m



**ANNEXURE U**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**TRAFFIC IMPACT STUDY**



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## Final Traffic Study

### For the proposed establishment of a Memorial Park on the Remainder of Farm Calcutta No. 29, Stellenbosch

**Project No. : STUR0216**

**MARCH 2019**

**PREPARED BY:**

STURGEON CONSULTING (PTY) LTD

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## DOCUMENT CONTROL SHEET

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19 March 2019	Final	NAME Barend du Preez, Pr. Eng	NAME Sarah Larratt, Pr. Tech Eng
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TITLE: TRAFFIC IMPACT ASSESSMENT FOR THE PROPOSED CALCUTTA MEMORIAL PARK			
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SYNOPSIS: This report assesses the key transportation issues pertaining to the development of the proposed memorial park on the Remainder of Farm Calcutta No. 29, Stellenbosch.			

**SUMMARY SHEET**

<b>Report Type</b>	Final Traffic Study
<b>Title</b>	Calcutta Memorial Park
<b>Location</b>	Stellenbosch, Western Cape
<b>Client</b>	CK Rumboll & Partners
<b>Reference Number</b>	STUR0216
<b>Project Team</b>	Sarah Larratt Annebet Krige Barend du Preez
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<b>Date</b>	March 2019
<b>Report Status</b>	Final

*This transport impact assessment has been prepared by a suitable qualified and registered professional traffic engineer. Details of any of the calculations on which the results of this report are based will be made available on request.*

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Figure 2: Site Development Plan

Figure 3: Present AM Traffic Demand (2019) plus Development

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Table 1: 2019 Peak Hour Traffic Conditions at Intersections

Table 2: 2024 Peak Hour Traffic Conditions at Intersections

## ACRONYMS

TIA – Traffic Impact Assessment

SDP – Site Development Plan

LOS – Level of Service

PHF – Peak Hour Factor

NMT – Non-motorised Transport

RNIS – Road Network Information System

AM – Morning

PM – Afternoon

AMP – Arterial Management Plan

d – Average delay in seconds

v/c – Volume/capacity ratio

vph – vehicles per hour

<b>Traffic Study</b>	
For the proposed development of a memorial park on the Remainder of the Farm Calcutta No. 29, Stellenbosch	
<b>1. Purpose of Report</b>	<p>To determine the access location and expected transport related impacts of the proposed development on the surrounding road network.</p> <p>This TIA is submitted as part of the application for the proposed development of the Calcutta Memorial Park.</p>
<b>2. Locality</b> <i>Reference: Figure 1</i>	<p>Farm Calcutta No. 29, Stellenbosch, Western Cape.</p> <p><b>Description:</b> The subject property is located approximately 10 km north of Stellenbosch, to the east of Main Road 174 (R304).</p>
<b>3. Scope of Work</b>	<p>The scope of work included in this TIA covers the following traffic engineering aspects:</p> <ul style="list-style-type: none"> <li>• Site observations;</li> <li>• Existing and proposed development;</li> <li>• Access arrangements;</li> <li>• Existing and future road network planning;</li> <li>• Existing traffic flows in the vicinity of the development;</li> <li>• Trip generation of the proposed development;</li> <li>• Traffic flow analysis;</li> <li>• Recommended road upgrades if necessary;</li> <li>• Non-motorised transport (NMT);</li> <li>• Public transport; and</li> <li>• Parking requirements.</li> </ul>
<b>4. Existing and Proposed Development</b>	<p>The subject property currently comprises approximately 39 ha of vacant land.</p> <p>The proposed memorial park will entail the facilities as indicated on the proposed Site Development Plan (SDP) below.</p> <p>The area that will be used for the actual cemetery uses includes:</p> <ul style="list-style-type: none"> <li>• Memorial Park Centre - ±0.40 ha</li> <li>• Defined Zone - ± 0.69 ha</li> <li>• Columbarium Zone - ± 0.75 ha</li> <li>• Traditional Graves ± 9.42 ha</li> <li>• (Informal Zone) Lawn graves, Trees as headstones and future expansion of cemetery uses: ± 6.20 ha</li> </ul> <p><b>Total size: ± 17.46 ha</b></p>





5. Land Use

Reference: Figure 2

Existing Use: Vacant

Proposed Use: Memorial Park (Cemetery)

Refer to Figure 2 for a copy of the latest SDP.

6. Existing and Proposed Access

**Existing Access:** There is currently no direct access to this portion of land from MR174.

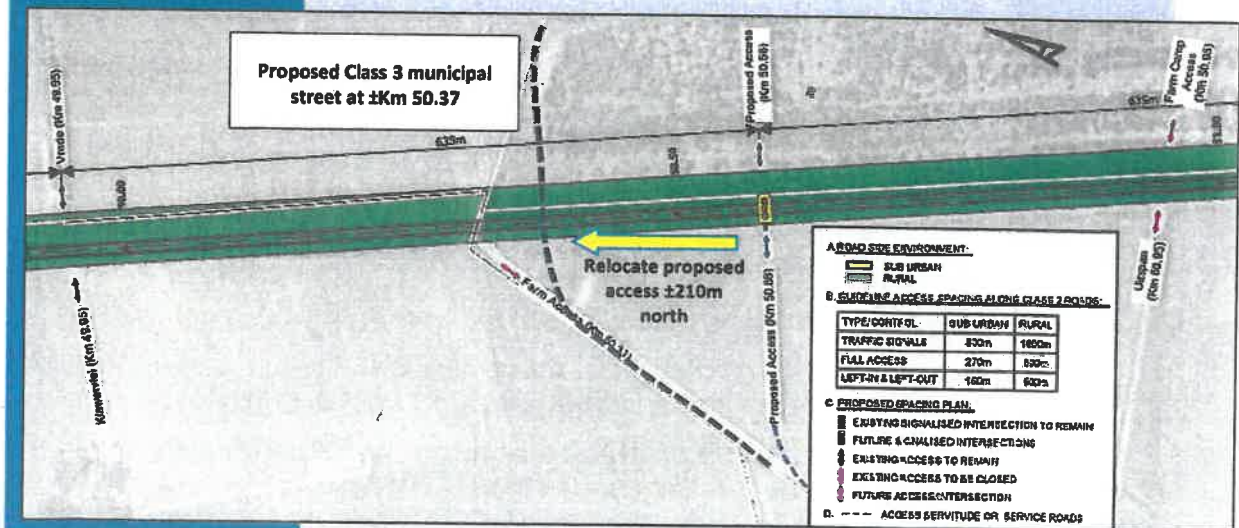
In 2012 ITS Engineers compiled an Arterial Management Plan for Main Road 174 (R304) (here after referred to as 2012 AMP) between Klipheuwel and Stellenbosch.

The copy of a portion of a table from the 2012 AMP below, provides the existing and proposed accesses between Old Paarl Road and Bottelary Road highlighting the proposed roundabout/signalled future intersections.

MR174 - KM 30.28 TO KM 60.22							
Location (Km)	Dist. (m)	Access/Intersection	Description	Existing Position	Proposed Position	Existing Control	Proposed Control and Access Recommendation
48.35	520	Future Intersection	Old Paarl Road & Proposed Access	West	East	Stop	Traffic Signal
48.49	140	Existing Access	Koelenhof Wine Cellars	East	None	Stop	Close / Relocate to Km48.35
48.79	300	Existing Access	Gerrit & Lindie Schneck	West	None	Stop	Close/Relocate to Km48.99
48.98	190	Future Intersection	Voortoe & Proposed Access	East	West	Stop	Traffic Signal
49.29	310	Existing Access	Farm Access	West	None	Stop	Close/Relocate to Km48.98
49.46	170	Existing Access	County Fair	West	None	Stop	Close/Relocate to Km48.98
49.95	490	Existing Intersection	Vrede & Klaverviel	Both	N/A	Stop	Stop to remain
50.31	360	Existing Access	Farm Access	West	None	Stop	Close
50.58	270	Future Intersection	Proposed Intersection	N/A	Both	N/A	Traffic Signal
50.95	370	Existing Intersection	Uitspan & Farm Access	Both	N/A	Stop	Close
51.23	280	Future Intersection	San Michelle & Proposed Access	West	East	Stop	Stop to remain
51.27	40	Existing Access	Tramirloc Systems	East	None	Stop	Close/Relocate to Km51.23
51.42	150	Existing Access	House Access	West	None	Stop	Close/Relocate to Km51.23
51.65	430	Future Intersection	Farm Access & Proposed Access	West	West	Stop	Stop to remain
51.86	10	Existing Access	Farm Access	West	None	Stop	Close
52.16	300	Existing Access	Rouba	West	None	Stop	Close/Relocate to Km51.85
52.36	200	Future Intersection	Proposed Intersection	N/A	Both	N/A	Traffic Signal
52.69	330	Existing Access	House Access	East	None	Stop	Close/Relocate to Km52.36
52.73	40	Existing Access	Corobnick	West	None	Stop	Close
53.19	460	Existing Intersection	Kromme Rhee (OR 1085) & Bottelary Road	Both	N/A	Traffic Signal	Roundabout

**Proposed Access:** The 2012 AMP suggested a future roundabout or signalled intersection off MR174 at Km 50.58 providing full access to both sides consolidating the existing accesses at Km 50.31 and Km 50.95 on the western side.

In order for the proposed cemetery to not have direct access off MR174 and divide the site in two, it is proposed that the intersection is relocated  $\pm 210m$  north (Km 50.37) allowing for a municipal street to be constructed along the northern boundary which would provide access to the cemetery.

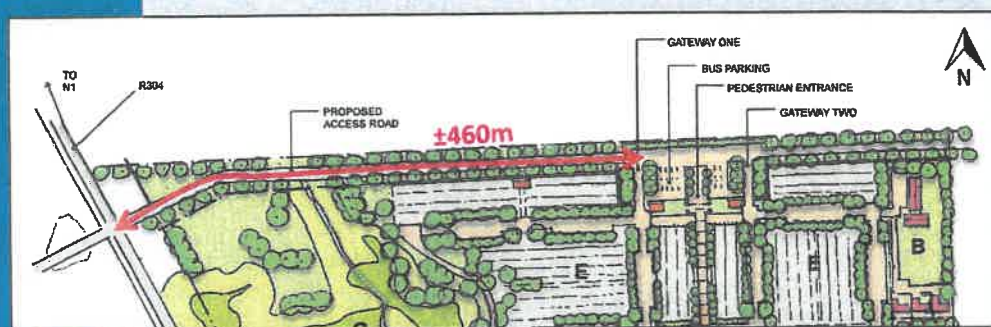


The farm access to the west of MR 174 at Km 50.31 will have to be realigned at the same time as the proposed access is implemented at Km 50.37.

The realignment is also affected by the ESKOM servitude as indicated below.



It is proposed that the access road off MR174 should be a Class 3 municipal street which would also serve possible future developments to the east. The proposed access to the cemetery is approximately 460m from MR174. This would ensure that any queuing that may occur at the entrance to the cemetery would not impact the two-way stop-controlled intersection on MR174.



It is not anticipated that the signalisation of the intersection on MR174 will be required before the dualling of Main Road 174 takes place.

The proposed location for the access will still ensure sufficient access spacing to the adjacent accesses / intersections.

## 7. Existing Roadways

**Main Road 174 (MR174):** Main Road 174 is a Class 2 Primary Arterial road with one lane per direction, a 100km/h speed limit, surfaced shoulders on both sides and no sidewalks. The road reserve can accommodate future dualling. It is a proclaimed Main Road (MR174) for which the WCG is the road authority. RNIS classifies this as a R3a road in terms of RCAM.



Stopping and Shoulder Sight Distances at the intersection will be more than adequate in both directions being on a stretch of the road that is very straight and flat.

## 8. Future Road Network

There are no planned roads in the vicinity of the site that will impact the proposed Calcutta Memorial Park. The future dualling of Main Road 174 will result in the possible upgrading of the proposed access to a roundabout or signalised intersection. However, the 2012 AMP looked at future traffic flows and came to the following conclusion: *“Old Paarl Road (MR 189) to Bottelary Road (MR 187) [km 47.83 to km 53.19]: This section will require additional through lanes, i.e. two lanes per direction within the next 10 to 15 years and will operate acceptably for the next 30 years under moderate growth scenarios. However, with higher growth, a third through lane per direction will be required in the next 25 to 30 years.”*

Based on the above the dualling of the section of MR174 between Old Paarl Road and Bottelary Road would be required between 2021 (2011 plus 10 years) and 2026 (2011 plus 15 years) depending on the rate of traffic growth. However, the existing intersections will require localised improvements to increase the stop line capacity which could include grade separation as discussed in detail in the 2012 AMP.

## 9. Analyses Hours

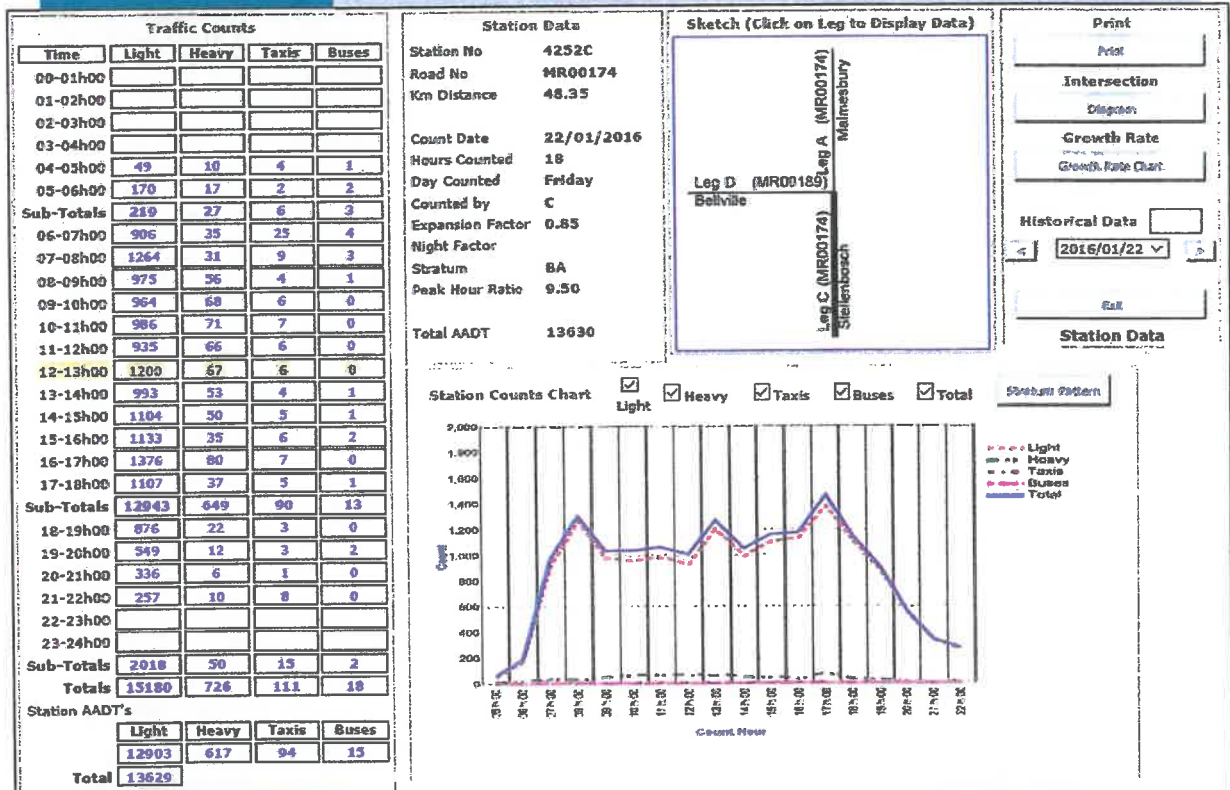
It was assumed that the worst case would be when a funeral takes place on a Friday midday when the traffic flow between Stellenbosch and the N1 is the highest for a midday. Saturday midday traffic flows are lower although more funerals take place over weekends for which analyses were also conducted.

- 10. Scenarios Analysed
  - 2019 Present Traffic Demand plus Development (Figures 3 & 4)
  - 2024 Background Traffic Demand plus Development (Figures 5 & 6)

Intersection analyses were done using SIDRA Intersection software (version 8).
- 11. Study Intersections
 

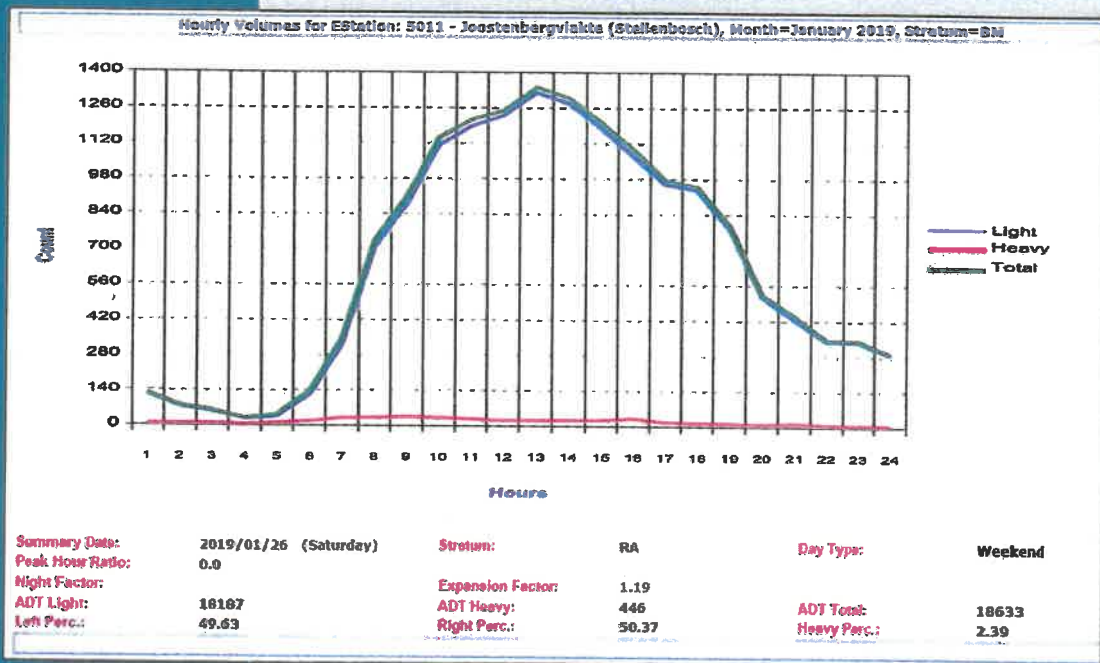
The proposed intersection at ±Km 50.37 on MR174 via which the cemetery will gain access.
- 12. Existing Operations
 

The Road Network Information System (RNIS) operated by Western Cape Department of Transport and Public Works contains a Traffic Counting System (TCS) which serves the Western Cape Provincial Network and has been around since 1999. The main emphasis of the system is on Trunk -, Main - and Divisional Roads - currently only Minor Roads (OPs) that intersect with more important roads are on the system. The TCS comprises of two "types" of counts namely: - Short Term and Permanent Counts. TCS has data for a counting station (4252) at the Old Paarl/MR174 intersection as well as a permanent station (5011) between the Sandringham Road and Old Paarl Road intersections.



The last count at Station 4252 took place on Friday, 22 January 2016. The midday peak hour is clearly visible with approximately 1 270 vehicles per hour (2-way) on the southern leg of the intersection. The estimated direction split is 60% towards Stellenbosch and 40% away from Stellenbosch. There are very few accesses between the counting station and the proposed access road and therefore it is assumed that the traffic past the development will be very similar.

The Saturday count was retrieved from the permanent Station 5011 for Saturday 19 January 2019.



From the graph, a two-way traffic volume of 1330 can be used for the Saturday peak hour. A split of 60/40 towards Stellenbosch has been assumed.

13. Known Developments

There are no known developments for which applications have been submitted close to the Memorial Park that would have a significant impact on the intersection which would not be covered by the growth in background traffic.

14. Background Traffic

The 2012 AMP based most of its analyses on a traffic growth rate of 5% per annum which was used to estimate the 2019 existing as well as the 2024 background Friday midday peak hour traffic volumes.

15. Trip Generation Rates

The vehicle trips that will be generated by the proposed development were calculated using the trip generation rates as provided in the TMH17 South African Trip Data Manual (Volume 1, September 2012) published by the Committee of Transport Officials (COTO).

The estimated trip generation rates for a Cemetery are:

566 Cemetery								1 Ha	
Description	AM Peak	PM Peak	Friday PM	Midday	Evening	Saturday	Sunday	Factor A	Factor B
Trip Rate	0.20	0.20		4.00		8.00			
% Heavy									
In/Out	70:30	35:65		75:25		50:50			
PHF Dev		0.65		0.65		0.65			
PHF Street									
Veh Occupancy									
% Pass-by									
% Diverted									

The proposed new intersection on MR174 was analysed for a Friday Midday and a Saturday peak hour. No peak hour reduction rates were applied as the property is located in a rural environment.

Data obtained from Stellenbosch Municipality for the number of funerals that took place in 2018 at the existing Jamestown Cemetery are:

- Monday to Friday: 110
- Saturday and Sunday: 376

Unfortunately, these numbers are very difficult to interpret without having more detail on the trends throughout the year. However, during weekdays there is approximately 1 funeral every second day. Weekends are much busier with between 4 and 5 funerals being held on a Saturday and Sunday.

#### 16. Development Trips

The areas that will be used for the actual cemetery uses are:

- Memorial Park Centre - ±0.40 ha
- Defined Zone - ±0.69 ha
- Columbarium Zone - ±0.75 ha
- Traditional Graves ±9.42 ha
- (Informal Zone) Lawn graves, Trees as headstones and future expansion of cemetery uses: ±6.20 ha
- **Total size: ± 17.46 ha**

The total Friday midday peak hour trips likely to be generated by the cemetery are **70 vph**. For a Saturday peak hour, it would be **140 vph**.

#### 17. Trip Distribution

With the majority of the population in the Stellenbosch Municipal area staying in Stellenbosch town and surrounding it was estimated that 90% of the trips would come from Stellenbosch and 10% from the northern areas via Old Paarl Road and the N1.

#### 18. Total Traffic

The resulting development trips were added to the existing (2019) and expected (2024) background traffic volumes. The resulting total traffic volumes are shown in Figure 3, 4, 5 and 6.

<p>References: Figure 3, 4, 5 &amp; 6</p>	
<p>19. Impact of Development Traffic</p> <p>References: Table 1 &amp; 2</p>	<p>Overall, the proposed intersection will operate at acceptable levels of service and delay with the v/c showing that the intersection will be under capacity.</p> <p>The right turners from the side roads in the 2024 scenario show a high delay (LOS F) however the volumes and the v/c ratios are very low. If required, a left turn lane could be added on the proposed access approach going towards Stellenbosch.</p> <p>A right turn lane from Stellenbosch will be required to minimise the delay for through traffic on MR174 and to improve safety at the intersection. It is also proposed that a left turn taper be constructed for traffic coming from the north to the cemetery. The design of the intersection should meet the Provincial road design standards.</p>
<p>20. Site Access</p>	<p>Access to the site will be from the proposed municipal street as indicated on the SDP. Gateway One will be an IN-only entrance while Gateway Two will be an OUT-only exit. The detail design of the access will have to be agreed with Stellenbosch Municipality.</p>



<p>21. Parking Requirements</p>	<p>The layout allows for people to travel through the cemetery and park in allocated areas nearest to where they would need to be. Formal parking for buses is provided for at the entrance to the cemetery.</p>
<p>22. Non-Motorised Transport (NMT)</p>	<p>There are no NMT facilities along MR174 in the vicinity of the site. Pedestrian movements are very low, and pedestrians tend to use the gravel verges or the hard shoulders alongside the road if necessary. MR174 is a popular sport cycling route where cyclist use the shoulders as a cycle lane. Yellow line driving is very prominent along the road and it is recommended that a Class 2 NMT facility be constructed as part of the future dualling of the road which should allow for both pedestrians and cyclists.</p>



## 23. Public Transport

Although minibus taxis and buses travel along MR174, no public transport facilities are provided on the section past the proposed site. Minibus taxis and buses will bring people to the cemetery and the layout does make provision for buses to park.



## 24. Conclusions

The main findings and conclusions are:

- To allow for the proposed cemetery to be developed without taking direct access off MR174 and dividing the site into two, it is proposed that a municipal street be constructed along the northern boundary of the site. To achieve this the 2012 AMP proposed future roundabout/signalised intersection needs to be relocated.
- The impact of the relocation will have a limited impact on the access spacing and still comply with the Access Management Guidelines (AMG).
- The access to the cemetery will be located approximately 460m east from the new intersection on MR147.
- MR174 carries approximately 1 500 veh/h two-way on a Friday midday and 1 360 veh/h two-way in the Saturday peak hour for 2019.
- The 2012 AMP predicted that dualling of MR174 will be required between 2021 and 2026 depending on the traffic growth.
- The intersection operates overall at acceptable levels of service for both scenarios.
- The intersection will require a right turn lane for traffic travelling north on MR174. A left turn taper is proposed on the northern leg. The realignment of the farm access to the west will have to coincide with the construction of the intersection.

## 25. Recommendations

From the report, the following recommendations are made:

- The new intersection at Km 50.37 must be designed and approved in accordance with the Provincial Standards;
- The new municipal street and access to the cemetery must be designed and approved by Stellenbosch Municipality.

This report has shown that the proposed development can be accommodated by the adjacent transport network, provided the

recommendations presented in the report are implemented. From a traffic engineering perspective, the application for this development is supported.

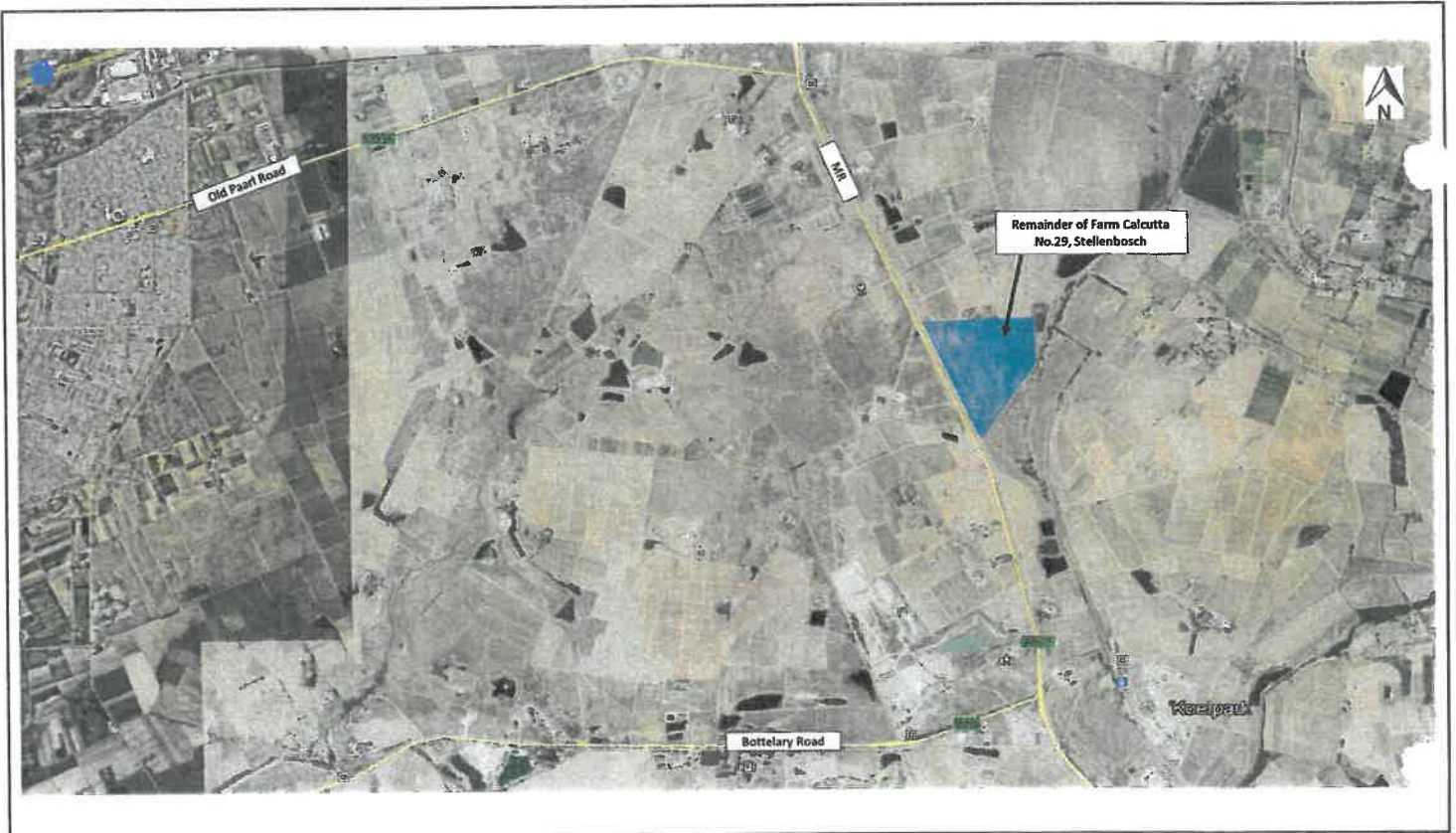
## **REFERENCES**

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5. Committee of Transport Officials (COTO), South African Trip Data Manual, Volume 1 TMH 17, September 2012.
6. Committee of Transport Officials (COTO), South African Traffic Impact and Site Traffic Assessment Manual Standards and Requirements Manual, Volume 2 TMH 16, September 2012.
7. Committee of Transport Officials (COTO), South African Traffic Impact and Site Traffic Assessment Manual, Volume 1 TMH 16, September 2012.

## **APPENDIX A: FIGURES**

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**STURGEON CONSULTING**  
Transport Planning & Traffic Engineering  
021 553 4157 / 083 701 2299

Project: **CALCUTTA MEMORIAL PARK**

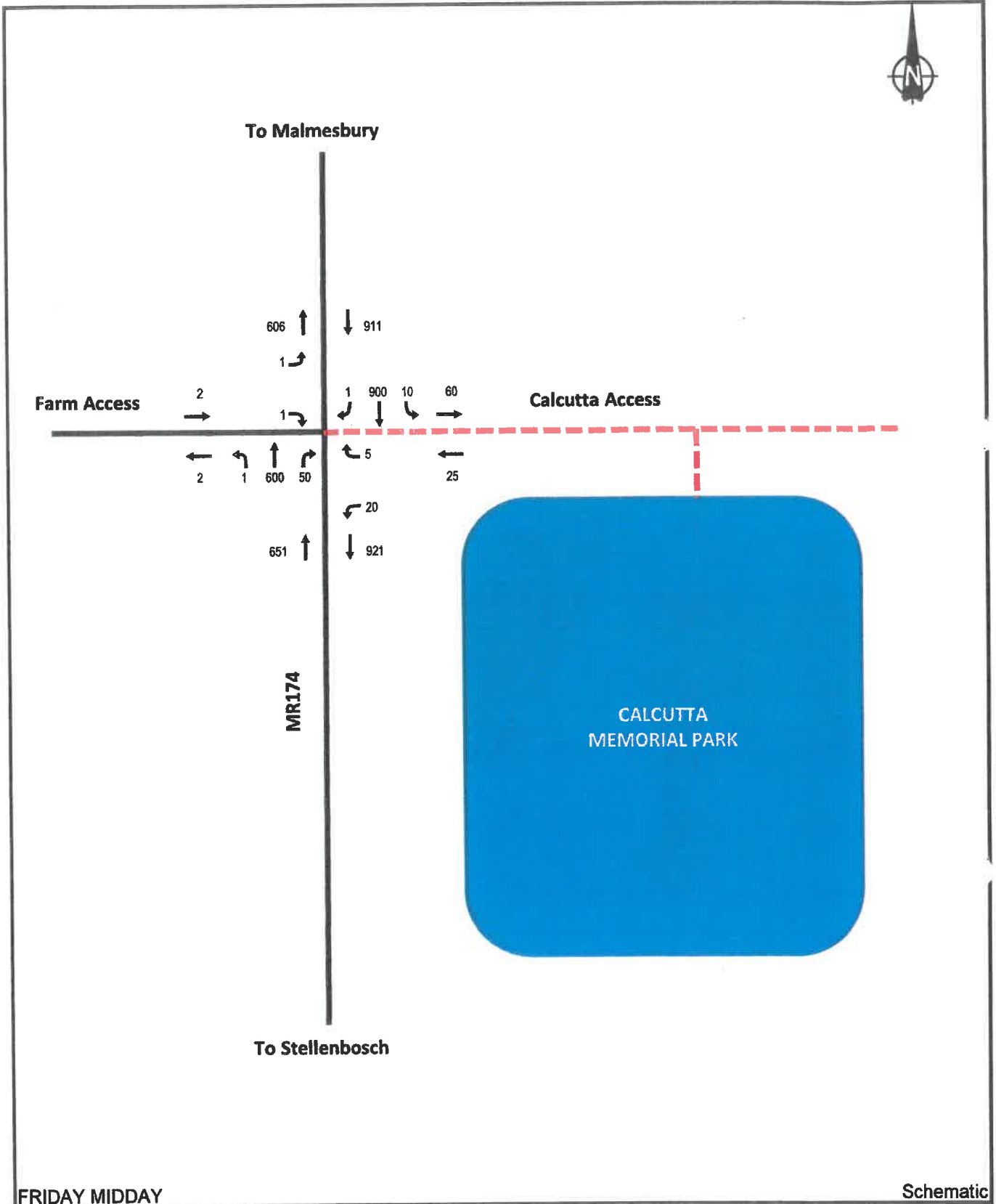
Job No: **STUR0216**


**LOCALITY PLAN**

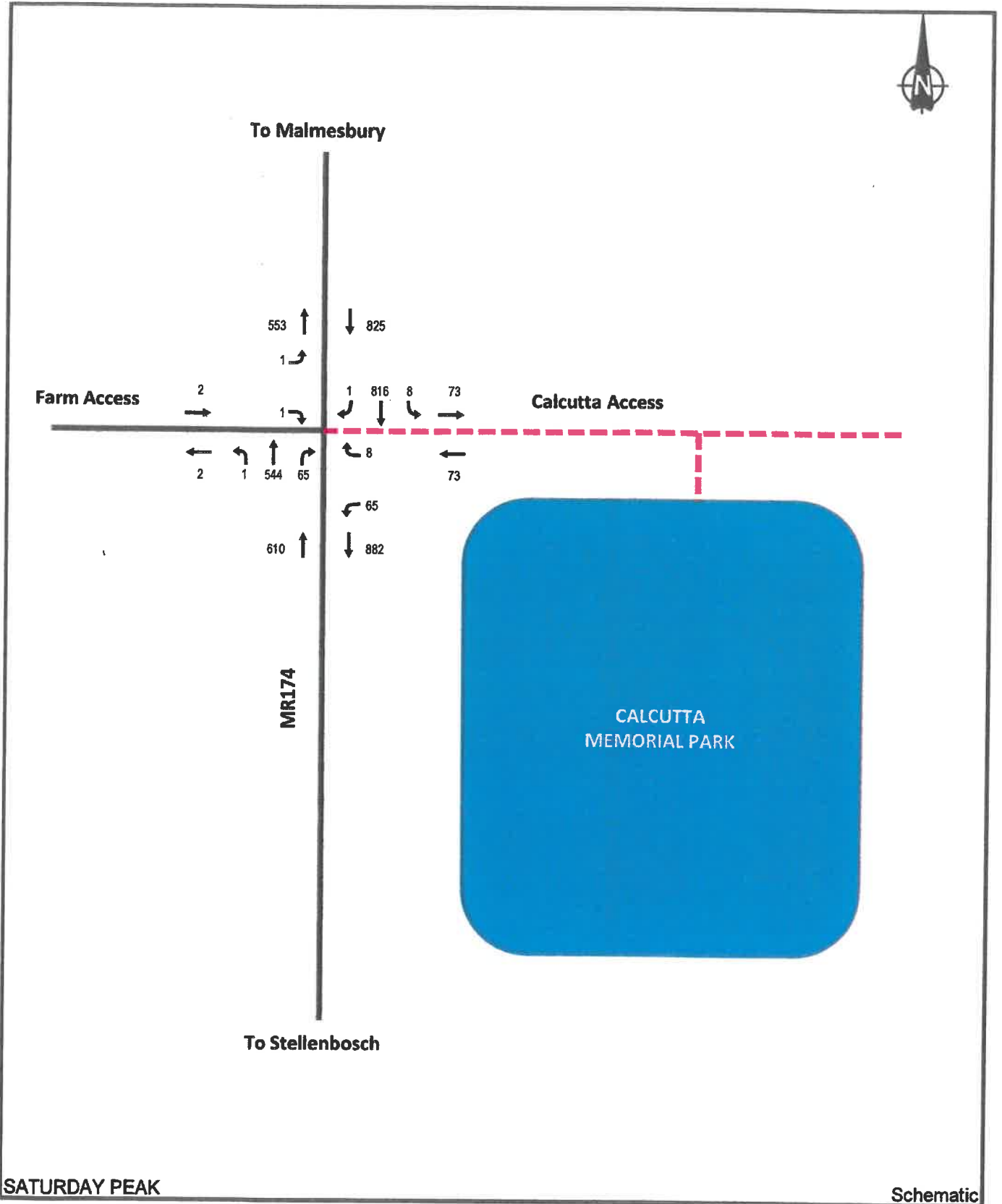
Figure: **1**



 Transport Planning & Traffic Engineering 021 553 4167 / 083 701 2299	Project:	<b>CALCUTTA MEMORIAL PARK</b>	Job No:	<b>STUR02016</b>
		<b>SITE DEVELOPMENT PLAN (N.T.S)</b>	Figure:	<b>2</b>



	Calcutta Memorial Park, Stellenbosch	Job Ref No: <b>STUR0216</b>
	<b>Present Traffic Demand (2019) plus Development</b>	Fig: <b>3</b>



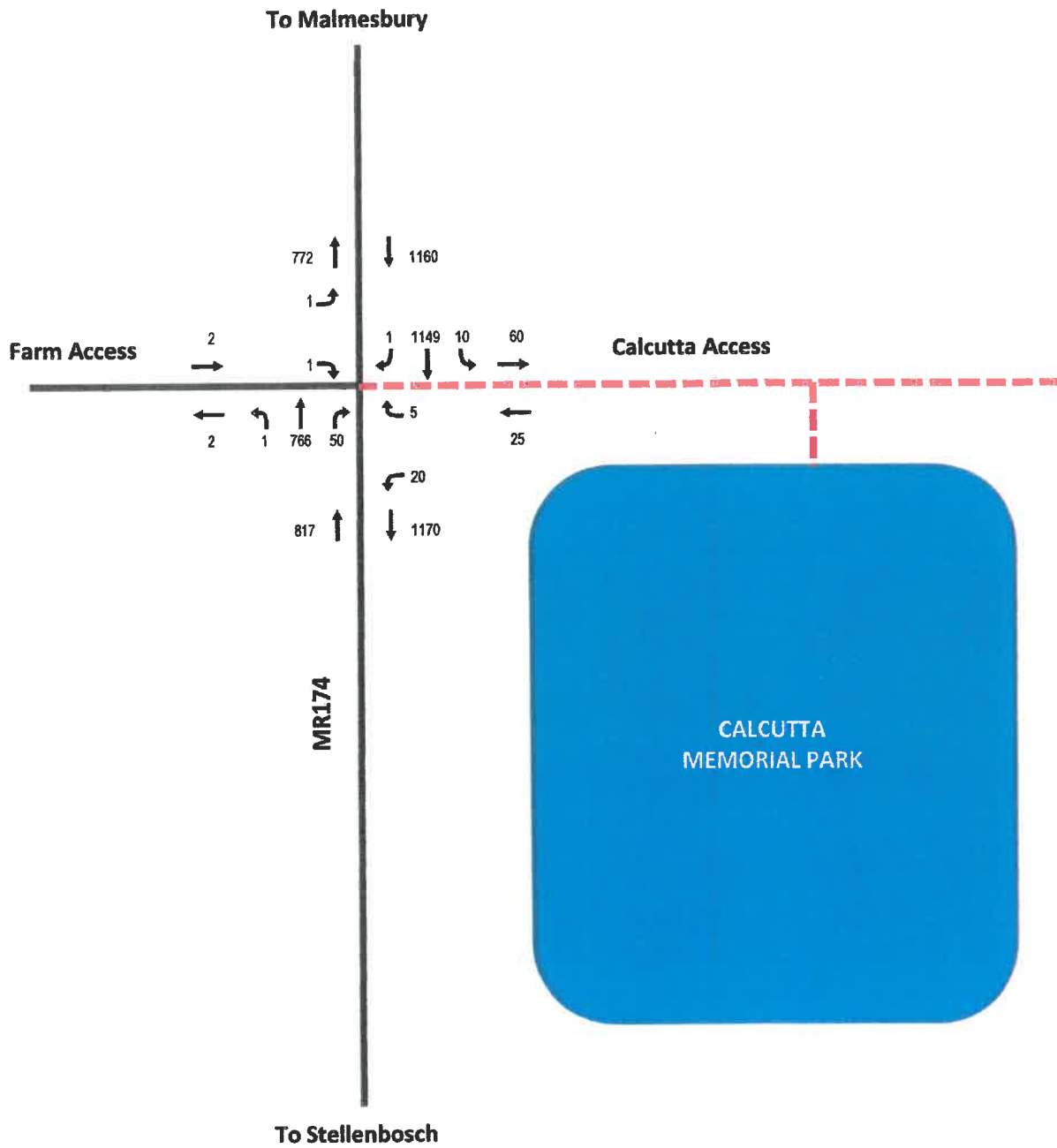
Calcutta Memorial Park, Stellenbosch

**Present Traffic Demand (2019) plus Development**

Job Ref No:  
**STUR0216**

Fig:  
**4**





FRIDAY MIDDAY

Schematic

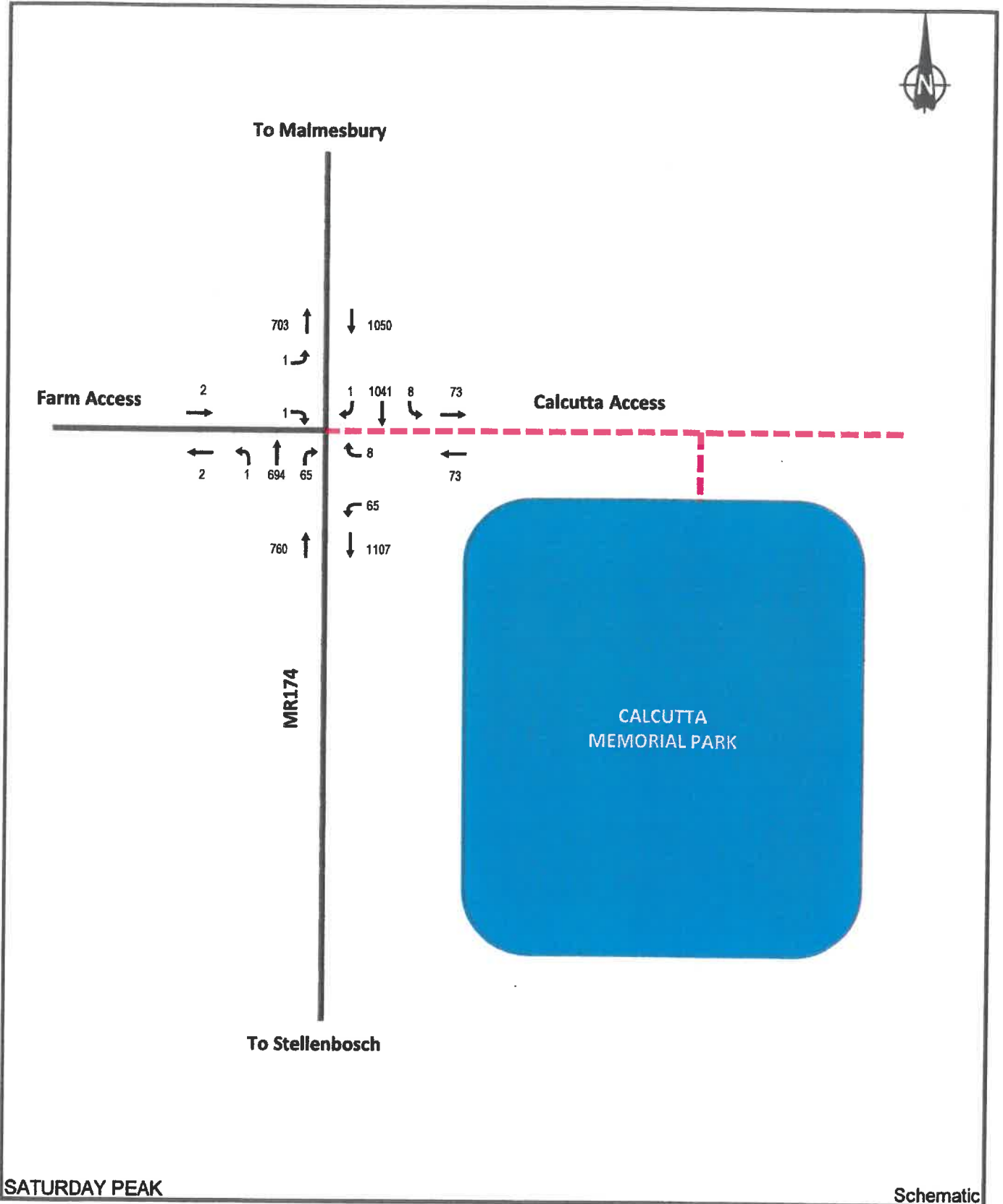



Calcutta Memorial Park, Stellenbosch

Job Ref No:  
**STUR0216**

**Expected 2024 Traffic Demand plus Development**

Fig: **5**



	Calcutta Memorial Park, Stellenbosch	Job Ref No: <b>STUR0216</b>
	<b>Expected 2024 Traffic Demand plus Development</b>	Fig: <b>6</b>

**APPENDIX B: TABLES**

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Table 1: 2019 Peak Hour Traffic Conditions at Intersections

 **Site: 101 [MR174/Farm Access/Calcutta Access 2019 Fri MIDDAY]**

Friday MIDDAY  
Site Category: Existing  
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/s	Flows HV %	Deg. Sat v/c	Average Delay sec	Level of Service	Aver. Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
<b>South: MR174 S</b>												
1	L2	1	2.0	0.438	17.0	LOS C	0.9	6.7	0.30	0.06	0.44	55.0
2	T1	632	2.0	0.438	2.6	LOS A	0.9	6.7	0.30	0.06	0.44	56.5
3	R2	53	2.0	0.438	16.9	LOS C	0.9	6.7	0.30	0.06	0.44	54.4
Approach		685	2.0	0.438	3.7	NA	0.9	6.7	0.30	0.06	0.44	56.3
<b>East: Calcutta Access E</b>												
4	L2	21	0.0	0.080	18.0	LOS C	0.1	0.9	0.83	1.00	0.83	45.5
5	T1	1	0.0	0.080	24.4	LOS C	0.1	0.9	0.83	1.00	0.83	45.3
6	R2	5	0.0	0.080	23.9	LOS C	0.1	0.9	0.83	1.00	0.83	45.1
Approach		27	0.0	0.080	19.4	LOS C	0.1	0.9	0.83	1.00	0.83	45.4
<b>North: MR174 N</b>												
7	L2	11	2.0	0.499	6.3	LOS A	0.0	0.1	0.00	0.01	0.01	56.2
8	T1	947	2.0	0.499	0.0	LOS A	0.0	0.1	0.00	0.01	0.01	59.9
9	R2	1	2.0	0.499	11.6	LOS B	0.0	0.1	0.00	0.01	0.01	57.5
Approach		959	2.0	0.499	0.1	NA	0.0	0.1	0.00	0.01	0.01	59.9
<b>West: Farm Access W</b>												
10	L2	1	0.0	0.011	11.9	LOS B	0.0	0.1	0.81	0.92	0.81	45.4
11	T1	1	0.0	0.011	23.8	LOS C	0.0	0.1	0.81	0.92	0.81	45.2
12	R2	1	0.0	0.011	23.1	LOS C	0.0	0.1	0.81	0.92	0.81	45.0
Approach		3	0.0	0.011	19.6	LOS C	0.0	0.1	0.81	0.92	0.81	45.2
All Vehicles		1675	2.0	0.499	1.9	NA	0.8	6.7	0.14	0.05	0.20	58.1

 **Site: 101 [MR174/Farm Access/Calcutta Access 2019 Sat Midday]**

Saturday Midday  
Site Category: Existing  
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Vehicles	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
<b>South: MR174 S</b>												
1	L2	1	2.0	0.414	14.3	LOS B	0.9	6.5	0.34	0.08	0.48	55.0
2	T1	573	2.0	0.414	2.5	LOSA	0.9	6.5	0.34	0.06	0.48	56.5
3	R2	65	2.0	0.414	14.3	LOS B	0.9	6.5	0.34	0.08	0.48	54.4
Approach		642	2.0	0.414	3.7	NA	0.9	6.5	0.34	0.08	0.48	55.3
<b>East: Calcutta Access E</b>												
4	L2	68	0.0	0.163	16.2	LOS C	0.3	2.0	0.79	1.00	0.79	47.0
5	T1	1	0.0	0.163	20.6	LOS C	0.3	2.0	0.79	1.00	0.79	46.8
6	R2	8	0.0	0.163	20.6	LOS C	0.3	2.0	0.79	1.00	0.79	46.6
Approach		78	0.0	0.163	16.7	LOS C	0.3	2.0	0.79	1.00	0.79	47.0
<b>North: MR174 N</b>												
7	L2	8	2.0	0.452	6.3	LOSA	0.0	0.1	0.00	0.01	0.01	58.2
8	T1	858	2.0	0.452	0.0	LOSA	0.0	0.1	0.00	0.01	0.01	59.9
9	R2	1	2.0	0.452	16.3	LOS B	0.0	0.1	0.00	0.01	0.01	57.5
Approach		868	2.0	0.452	0.1	NA	0.0	0.1	0.00	0.01	0.01	59.9
<b>West: Farm Access W</b>												
10	L2	1	0.0	0.009	11.3	LOS B	0.0	0.1	0.76	0.89	0.76	46.5
11	T1	1	0.0	0.009	19.7	LOS C	0.0	0.1	0.76	0.89	0.76	46.6
12	R2	1	0.0	0.009	20.2	LOS C	0.0	0.1	0.76	0.89	0.76	46.4
Approach		3	0.0	0.009	17.1	LOS C	0.0	0.1	0.76	0.89	0.76	46.6
All Vehicles		1592	1.9	0.452	2.4	NA	0.9	6.5	0.16	0.99	0.24	57.8

**Table 2: 2024 Peak Hour Traffic Conditions at Intersections**

**Site: 101 [MR174/Farm Access/Calcutta Access 2024 Fri Midday]**

Friday Midday  
Site Category: 2024  
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Dep. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
<b>South: MR174 S</b>												
1	L2	1	2.0	0.402	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.2
2	T1	766	2.0	0.402	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	50	2.0	0.132	14.9	LOS B	0.2	1.3	0.82	0.93	0.92	46.9
<b>Approach</b>		817	2.0	0.402	1.0	NA	0.2	1.3	0.05	0.06	0.05	58.9
<b>East: Calcutta Access E</b>												
4	L2	20	0.0	0.078	22.6	LOS C	0.1	0.9	0.69	1.00	0.99	43.1
5	T1	1	0.0	0.078	62.4	LOS F	0.1	0.9	0.99	1.00	0.99	43.0
6	R2	5	0.0	0.078	55.0	LOS F	0.1	0.5	0.96	1.00	0.96	31.3
<b>Approach</b>		26	0.0	0.078	30.0	LOS D	0.1	0.9	0.90	1.00	0.90	40.2
<b>North: MR174 N</b>												
7	L2	10	2.0	0.604	6.9	LOS A	0.0	0.2	0.01	0.01	0.01	58.2
8	T1	1149	2.0	0.604	0.0	LOS A	0.0	0.2	0.01	0.01	0.01	59.9
9	R2	1	2.0	0.604	16.3	LOS C	0.0	0.2	0.01	0.01	0.01	57.5
<b>Approach</b>		1160	2.0	0.604	0.1	NA	0.0	0.2	0.01	0.01	0.01	59.9
<b>West: Farm Access W</b>												
10	L2	1	0.0	0.027	13.0	LOS B	0.0	0.2	0.92	0.94	0.92	36.2
11	T1	1	0.0	0.027	61.2	LOS F	0.0	0.2	0.92	0.94	0.92	36.2
12	R2	1	0.0	0.027	66.1	LOS F	0.0	0.2	0.92	0.94	0.92	36.1
<b>Approach</b>		3	0.0	0.027	40.1	LOS E	0.0	0.2	0.92	0.94	0.92	36.2
<b>All Vehicles</b>		2036	2.0	0.604	0.9	NA	0.2	1.3	0.04	0.04	0.04	59.0

**Site: 101 [MR174/Farm Access/Calcutta Access 2024 Sat Midday]**

Saturday Midday  
Site Category: 2024  
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Seg. Satn %	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
<b>South: MR174 S</b>												
1	L2	1	2.0	0.363	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.2
2	T1	694	2.0	0.363	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	65	2.0	0.161	14.3	LOS B	0.2	1.6	0.80	0.92	0.80	47.2
Approach		760	2.0	0.363	1.3	NA	0.2	1.6	0.07	0.06	0.07	56.6
<b>East: Calcutta Access E</b>												
4	L2	65	0.0	0.208	22.3	LOS C	0.4	2.5	0.87	1.01	0.91	43.7
5	T1	1	0.0	0.208	59.6	LOS F	0.4	2.5	0.87	1.01	0.91	43.6
6	R2	8	0.0	0.121	60.1	LOS F	0.1	1.0	0.96	1.00	0.96	30.0
Approach		74	0.0	0.208	26.9	LOS D	0.4	2.5	0.88	1.01	0.91	41.6
<b>North: MR174 N</b>												
7	L2	8	2.0	0.546	6.0	LOS A	0.0	0.2	0.01	0.01	0.01	58.2
8	T1	1041	2.0	0.546	0.0	LOS A	0.0	0.2	0.01	0.01	0.01	59.9
9	R2	1	2.0	0.546	13.5	LOS B	0.0	0.2	0.01	0.01	0.01	57.6
Approach		1050	2.0	0.546	0.1	NA	0.0	0.2	0.01	0.01	0.01	59.9
<b>West: Farm Access W</b>												
10	L2	1	0.0	0.032	12.7	LOS B	0.0	0.3	0.92	0.93	0.92	34.5
11	T1	1	0.0	0.032	55.3	LOS F	0.0	0.3	0.92	0.93	0.92	34.4
12	R2	1	0.0	0.032	67.8	LOS F	0.0	0.3	0.92	0.93	0.92	34.4
Approach		3	0.0	0.032	45.2	LOS E	0.0	0.3	0.92	0.93	0.92	34.4
All Vehicles		1887	1.9	0.546	1.7	NA	0.4	2.5	0.07	0.08	0.07	58.3

**ANNEXURE V**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**OTHER STUDIES**





*Geohydrological assessment – Culcatta  
Cemetery site. Stellenbosch Municipality*

**REPORT:**

GEOSS Report No: 2018/10-36

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*23 October 2018*

## EXECUTIVE SUMMARY

Stellenbosch Municipality urgently requires additional burial sites (also known as Memorial Parks) to service the larger Stellenbosch Municipal area. Through a process of elimination, the municipality have identified Farm portion 29 (Culcatta) as a potential site. The site covers an area of 39.64 Ha portion. GEOSS was tasked to complete a preliminary geohydrological study of the potential site. The Memorial Park will be an expanded cemetery, which will allow significant leeway for walkways and landscaping (which could take the form of natural corridors).

The site is approximately 6 km north of Stellenbosch along the R305. The site is not developed and is heavily infested with alien vegetation and relatively flat in terms of relief. The Farm portion boundary is underlain by loam and sandy loam. These Cenozoic sediments are most likely underlain by greywacke, phyllite and quartzitic sandstone of the Tygerberg Formation (Malmesbury Group).

The proposed Memorial Park is located on an aquifer which is classified as a “fractured” aquifer i.e. fissured and fractured bedrock resulting from decompression and/or tectonic action of the bedrock. Groundwater occurs predominantly within fissures and fractures. If a borehole was drilled within this site, the borehole yield may be in the region of 0.5 to 2 L/s. The DWAF (1999) classification of the regional groundwater quality, as indicated by electrical conductivity (EC), has been classified as “marginal” to “good”. The EC of the area ranges from 70 – 300 mS/m.

There are a number of groundwater users in the area especially to the north and west of the site. The use of groundwater includes domestic, agricultural, livestock and town supply. Approximately 200 m from the northern boundary of the proposed Memorial park, two boreholes exist with good groundwater quality (used for domestic purposes).

The majority of the site is classified as having a “low/medium” groundwater vulnerability rating. The southern portion of the site has been classified as “medium” grading into a “very high” vulnerability classification.

From a groundwater perspective, the site is in close proximity to a number of groundwater users that depend on groundwater as a source. It is recommended that should the site be considered viable from all other perspectives then three to four exploration boreholes be drilled on site to bedrock to determine the groundwater level; aquifer thickness; nature of material of the surficial cover; and groundwater quality.

Ooooo OOO ooooo

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## ABBREVIATIONS

ha	hectare
L/s	litres per second
m	metres
mS/m	milliSiemens per meter
NGA	National Groundwater Archive

## GLOSSARY OF TERMS

**Aquifer:** a geological formation, which has structures or textures that hold water or permit appreciable water movement through them [from National Water Act (Act No. 36 of 1998)].

**Borehole:** includes a well, excavation, or any other artificially constructed or improved groundwater cavity which can be used for the purpose of intercepting, collecting or storing water from an aquifer; observing or collecting data and information on water in an aquifer; or recharging an aquifer [from National Water Act (Act No. 36 of 1998)].

**Fractured aquifer:** Fissured and fractured bedrock resulting from decompression and/or tectonic action. Groundwater occurs predominantly within fissures and fractures.

**Groundwater:** water found in the subsurface in the saturated zone below the water table or piezometric surface i.e. the water table marks the upper surface of groundwater systems.

**Intergranular Aquifer:** Generally unconsolidated but occasionally semi-consolidated aquifers. Groundwater occurs within intergranular interstices in porous medium. Typically occur as alluvial deposits along river terraces.

**Intergranular and fractured aquifers:** Largely medium to coarse grained granite, weathered to varying thicknesses, with groundwater contained in intergranular interstices in the saturated zone, and in jointed and occasionally fractured bedrock.

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### Suggested reference for this report:

GEOSS (2018). Geohydrological assessment – Culcatta Cemetery site. Stellenbosch Municipality. Report Number 2018/10-36. GEOSS - Geohydrological & Spatial Solutions International (Pty) Ltd. Stellenbosch, South Africa.

### Cover photo:

Map of the proposed Culcatta cemetery site

### GEOSS project number:

2015\_07-1490.

---

## 1. INTRODUCTION

The Stellenbosch Municipality urgently requires additional burial sites (also known as Memorial Parks) to service the larger Stellenbosch Municipal area. Through a process of elimination, the municipality have identified Farm portion 29 (Culcatta) as a potential site. The area is 39.64 Ha in size. GEOSS was tasked to complete a preliminary geohydrological study of the potential site.

## 2. TERMS OF REFERENCE

The prime objective of the project is to determine the geohydrological setting of the proposed Memorial Park by means of a desktop site characterization using available geohydrological data as well as an on-site assessment.

## 3. THE “CULCATT” SITE

The site is approximately 6 km north of Stellenbosch along the R305 (**Map 1, Appendix A**). The site is not developed and is heavily infested with alien vegetation and relatively flat in terms of relief (**Map 2, Appendix A**).

### 3.1 Geology

The Geological Survey of South Africa (now the Council for Geoscience (CGS)) has mapped the area at 1:250 000 scale (3318 Cape Town). The geological setting is shown in **Error! Reference source not found. (Appendix A)** and the main geology of the area is listed in **Error! Reference source not found.**

*Table 1: Geological formations within the study area*

Code	Formation	Group
Qgg	Gravelly clay/loam soil	Quaternary
Qg	Loam and sandy loam	
Qs	Light-grey to pale-red sandy soil	
Nt	Tygerberg Formation	Malmesbury

The Farm portion boundary is underlain by loam and sandy loam (Qg). These Cenozoic sediments are most likely underlain by greywacke, phyllite and quartzitic sandstone of the Tygerberg Formation (Nt) (Malmesbury Group).

### 3.2 Hydrogeology

The proposed Memorial Park is located on an aquifer which is classified as an “fractured” aquifer i.e. fissured and fractured bedrock resulting from decompression and/or tectonic action. Groundwater occurs predominantly within fissures and fractures. If a borehole was drilled within this site, the borehole yield may be in the region of 0.5 to 2 L/s. (**Map 4, Appendix A**).

Based on the DWAF (1999) classification the regional groundwater quality, as indicated by electrical conductivity (EC), has been classified as “marginal” to “good”. The EC of the area ranges from 70 – 300 mS/m (**Map 5, Appendix A**)

### ***3.3 Hydrology***

A small north-east / south-west water course, a tributary to the Plankenbrug River, flows to the east of the proposed memorial site. Flow within this watercourse will only occur during heavy rainfall events. Adjacent to the watercourse, to the north-east of the proposed Memorial Park, an agricultural dam is located.

### ***3.4 Groundwater vulnerability and use***

A national groundwater vulnerability map was developed using the DRASTIC methodology. The DRASTIC system is the most widely method used to evaluate intrinsic vulnerability for a wide range of potential contaminants. It is an overlay and index model designed to produce vulnerability scores by combining several thematic maps. It was originally developed in USA under cooperative agreement between the National Water Well Association (NWWA) and the US Environmental Protection Agency (EPA) for detail hydrogeological evaluation of pollution potential (Aller et al. 1987). The word DRASTIC is acronym for most important factors within the hydrogeological settings which control groundwater pollution. Hydrogeological setting is a composite description of all major geologic and hydrogeological factors which affect the groundwater movement into, though, and out of the area. These factors are:

- depth to water,
- net recharge,
- aquifer media,
- soil media,
- topography (slope),
- impact of vadose zone, and
- hydraulic conductivity.

The DRASTIC numerical ranking system contains three major parts: weights, ranges, and ratings.

The majority of the proposed study site is on an area classified as having a “low/medium” groundwater vulnerability rating. The southern portion of the property has been classified as “medium” grading into “very high” (**Map 6, Appendix A**).

### **3.5 Groundwater use**

The proposed Memorial Park is located within a mostly agricultural region. Based on the number of agricultural dams in the region the agricultural sector utilizes mostly surface water to supply their needs.

The National Groundwater Achieve (NGA) database, which provides data on borehole positions, groundwater chemistry and yield, indicates that within the search radius there are no groundwater users in the area.

However four sites (to be considered as areas) were identified as groundwater users (**Map 2, Appendix A**). GEOSS has conducted a number of projects in the surrounding area ranging from hydrocensus's to groundwater exploration. Additional information for the area was obtained from borehole drilling companies.

### **3.6 Site 1 - Vrede:**

Vrede is a wine farm located directly north of the Culcatta boundary. The wine farm has four boreholes but only use two. The boreholes were drilled to a depth of between 90 – 150 m and have yields ranging between 4 – 16 L/s. VBH1 and VBH2 are used for domestic and agricultural use. Drill chips located near the boreholes indicate they were drilled into granite. The farm manger reported the fracture depths of VBH2 to be between 120 -125 m. VBH3 and VBH4 are reported to have high iron concentrations and do not meet agricultural water quality parameters, therefore they are not used. The borehole are approximately 200 m north of the proposed Culcatta Memorial Park.

### **3.7 Site 2 – Wild Clover:**

Wild Clover farm is located directly north-west of the Culcatta boundary and is a small holding. The estate has four boreholes (they were drilled back in the 90's and no drill records are available) of which only one is in use. The boreholes were drilled to a depth of between 60 –90 m and have yields ranging between 0.5 – 1.25 L/s. WCBH1 is the only borehole being used on the estate with a yield of 1.25 L/s. The field chemistry indicates the groundwater to be “marginal” as classified according to DWAF standards.

### **3.8 Site 3 - Mariendahl:**

The Mariendahl area is located to the east of the Culcatta boundary. Five boreholes were drilled on the site in 2017 for drought relief. The boreholes were drilled to depths of 100 m. The main water strikes were intercepted at depths of 40 – 60 m below ground level.

The borehole blow yields ranged from 0.5 – 12.5 L/s. Water chemistry results were obtained from laboratory results. The groundwater is intended to be used for town supply.

### 3.9 Site 4 and 5:

No site access was granted to the farm portion directly west of the proposed Culcatta Memorial Park.

**Table 2: Summary of boreholes within a 1 km search radius**

Farm	Site ID	Latitude	Longitude	Yield (L/s)	EC mS/m	pH
Vrede	VDBH1	-33.847518	18.810327	9.7	91	7.3
	VDBH2	-33.848950	18.810692	16.0	78	7.4
	VDBH3	-33.845293	18.804203	-	-	-
	VDBH4	-33.846144	18.812234	-	-	-
Wild Clover	WCBH1	-33.848577	18.801397	1.3	292	6.5
Mariendahl	MD_BH1	-33.843792	18.824450	-	133	6.4
	MD_BH3	-33.847545	18.824960	-	-	-
	MD_BH4	-33.852770	18.825460	-	52	6.2
	MD_BH5	-33.843910	18.827410	-	73	6.5

## 4. DISCUSSION

The “Culcatta” site is located north of Stellenbosch along the R305. The surficial cover of the site comprises loam and sandy loam. These Cenozoic sediments are most likely underlain by greywacke, phyllite and quartzitic sandstone of the Tygerberg Formation (Malmesbury Group).

Groundwater users were identified to the north, east and south of the proposed memorial park. The uses of groundwater include domestic, agricultural, livestock and town supply. Site 1 has two boreholes ~200 m from the northern boundary of good groundwater quality which is used for domestic purposes.

The site has a “medium” groundwater vulnerability rating, due to the argillaceous nature of the surficial cover. The thickness of the surficial cover is unknown as no drill records could be obtained.

From a groundwater perspective, the site is in close proximity to a number of groundwater users that depend on groundwater as a source. It is recommended that should the site be considered viable from all other perspectives, then three to four exploration boreholes be drilled on site to bedrock to determine the groundwater level; aquifer thickness; nature of material of the surficial cover; and groundwater quality. These boreholes can then also be used as monitoring boreholes if the site becomes operational.



## 5. REFERENCES

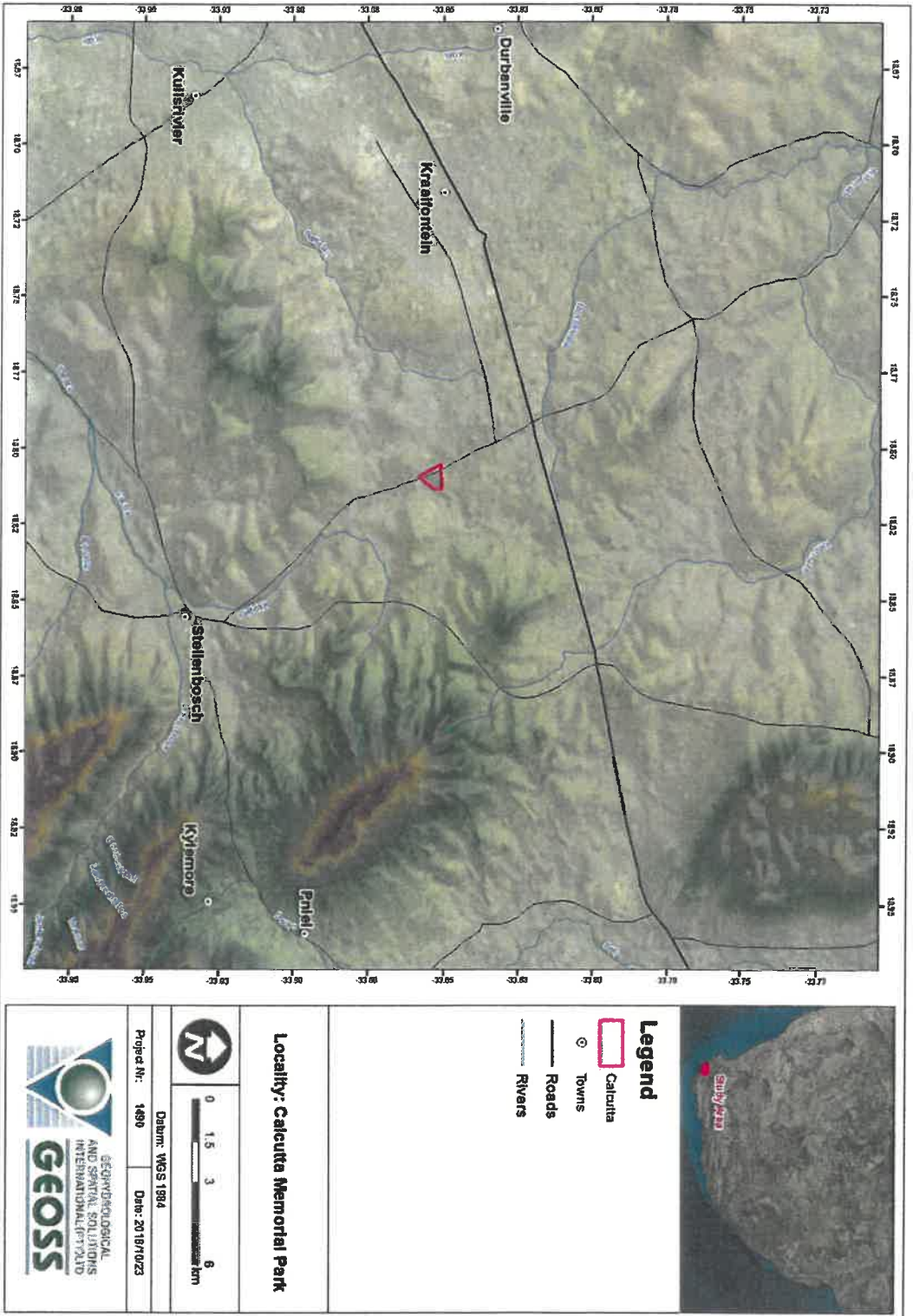
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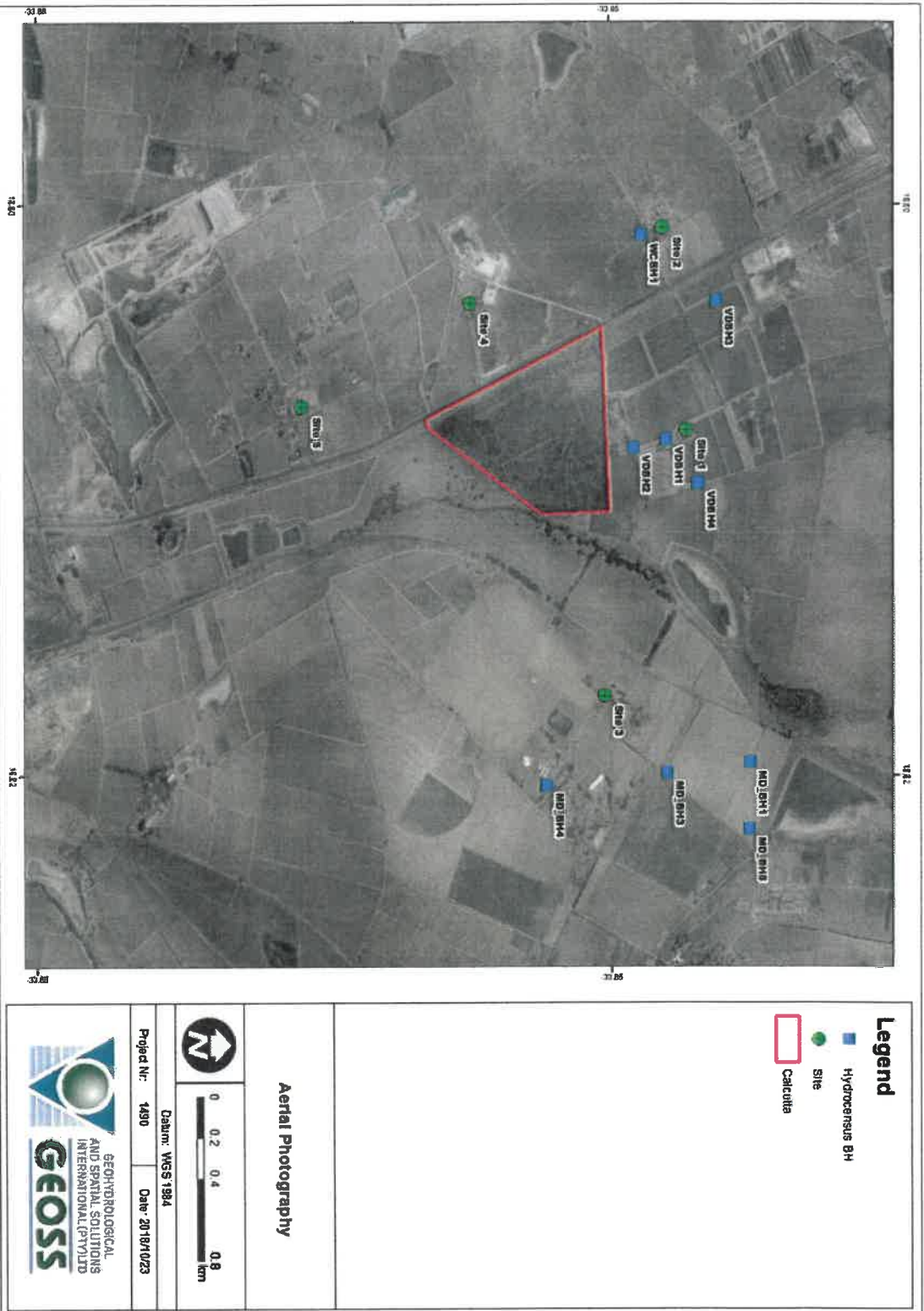
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**6. APPENDIX A: MAPS – CULCATT**

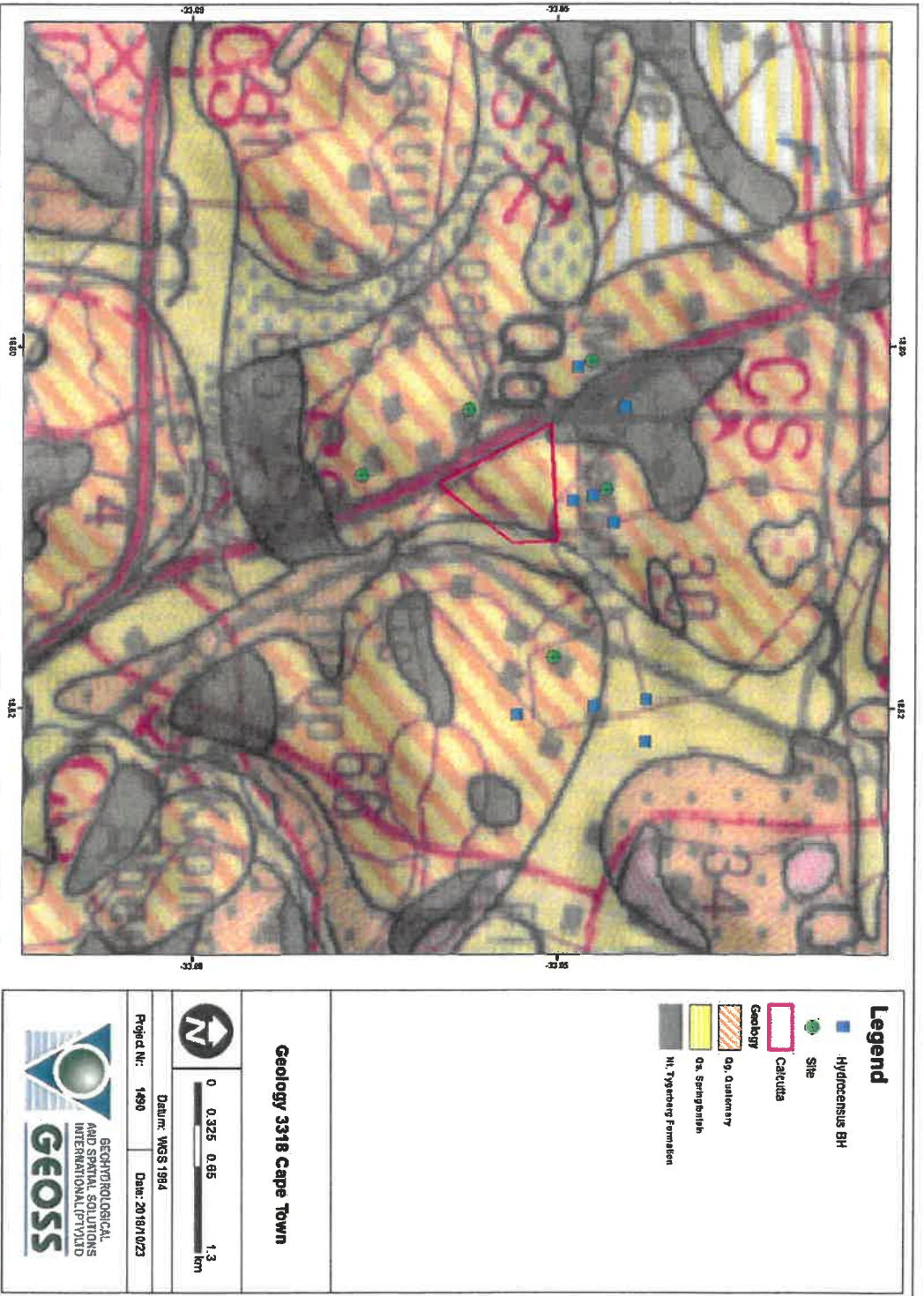
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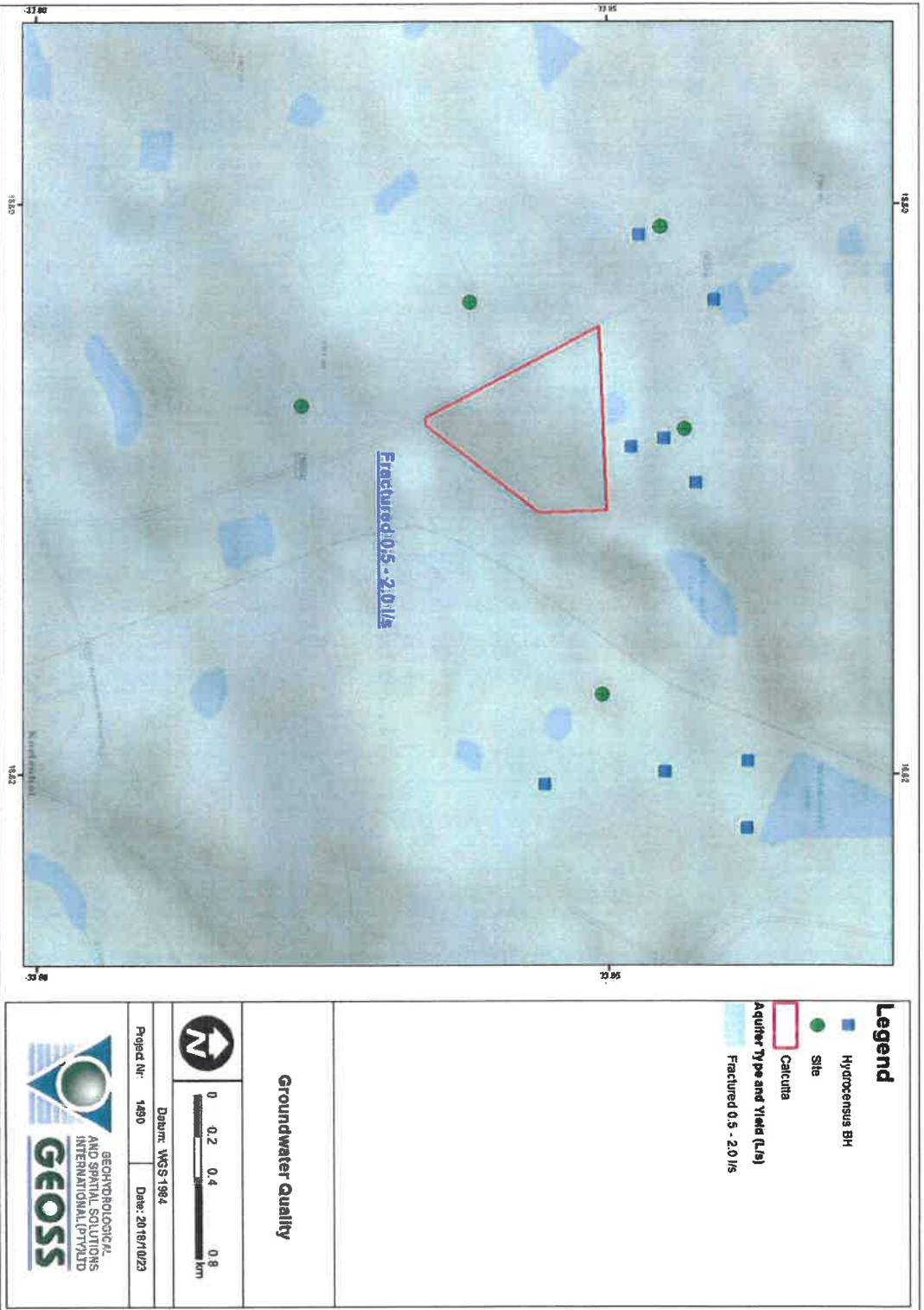
Map 1: Location of the Calcutta study area within a regional setting



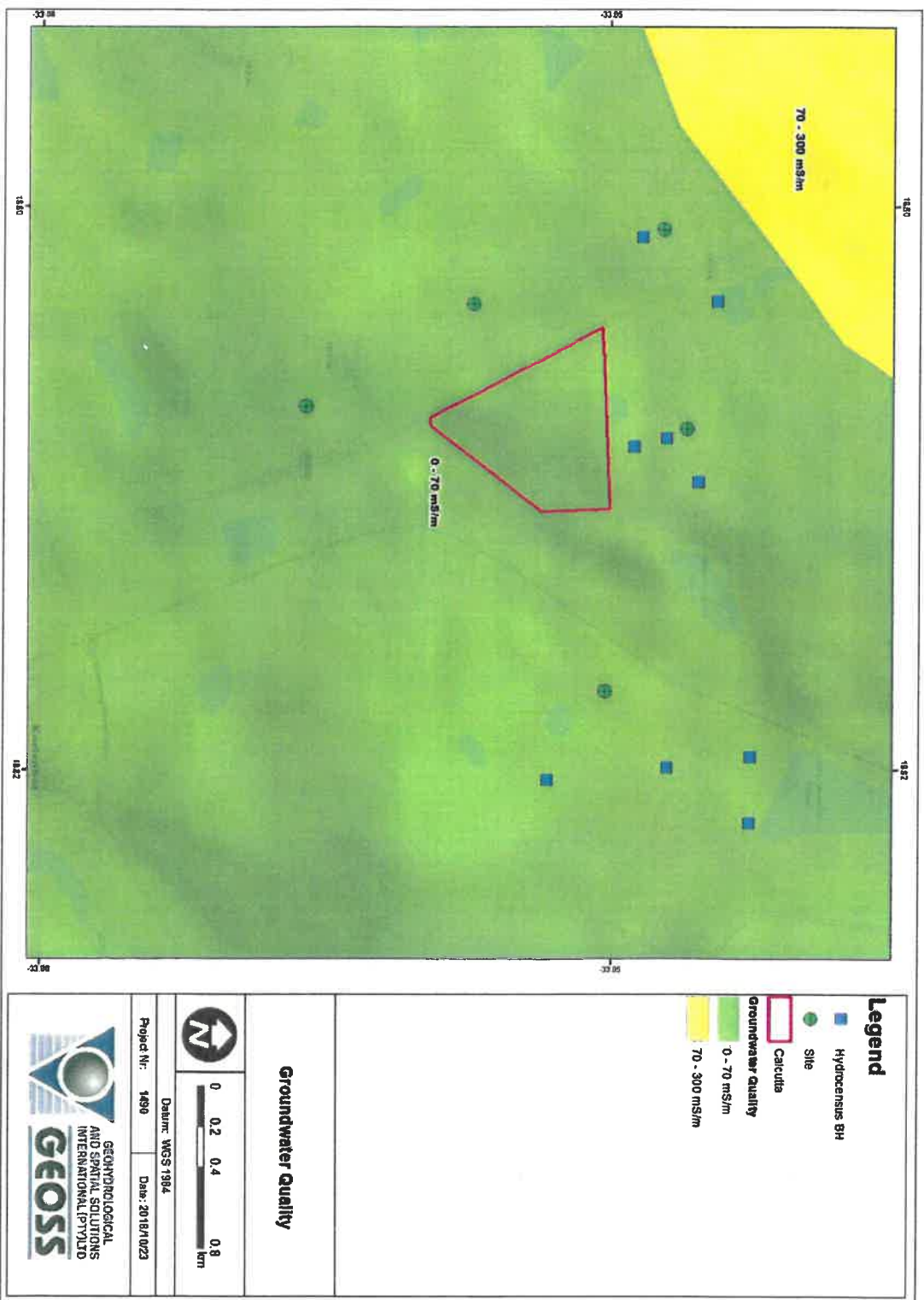
Map 2: The Culcatta study site superimposed on an aerial photograph



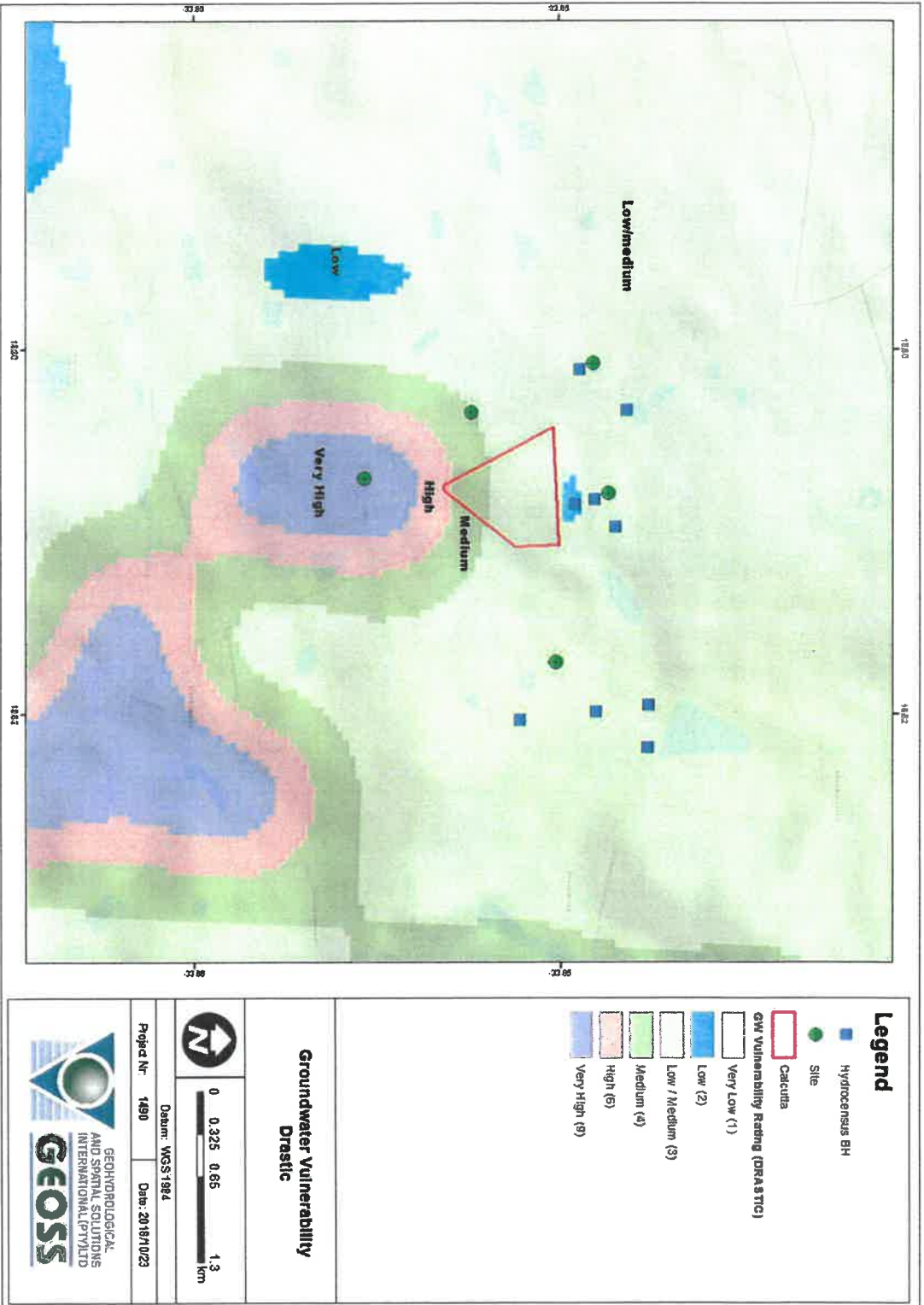
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**Freshwater Assessment:**

**Calcutta, Farm 29, Stellenbosch, Western  
Cape**

Prepared for:

**Stellenbosch Municipality**

Prepared by:

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**Date: December 2018**

**Joshua Gericke  
Sole Proprietor**

**T/A EnviroSwift Western Cape**

## Executive Summary

Stellenbosch Municipality proposes establishment of a memorial park on Calcutta, Farm 29, Stellenbosch (refer to Figure 1 for location). EnviroSwift Western Cape has been appointed to undertake a specialist assessment of the freshwater features within the farm to inform the Basic Assessment and Water Use Authorisation application for the proposed development.

The site is currently not being utilised and is dominated by alien invasive vegetation such as *Lolium perenne*, *Acacia saligna*, and *Eucalyptus* species. A proposed layout of the development of Farm 29 has been provided. The proposed layout is not final however and this report will inform the final layout.

The proposed memorial park development will however include the following:

- Construction of hardened infrastructure including a chapel, office, columbarium, public toilets, an access road and hardened pathways;
- Installation of graves;
- Landscaping of the cemetery and of a parkland including a small forest and informal parkland of mixed fynbos vegetation and indigenous trees for shade and screening where appropriate with cleared, unmade pathways in between.

### *Desktop Assessment*

Farm 29 lies within the Berg Water Management Area (WMA), the Greater Cape Town Sub-WMA and the G22G quaternary catchment. It is characterised by Critically Endangered Swartland Shale Renosterveld terrestrial vegetation type (Mucina & Rutherford, 2006, revised 2009 and 2012); and Critically Endangered West Coast Shale Renosterveld wetland vegetation type.

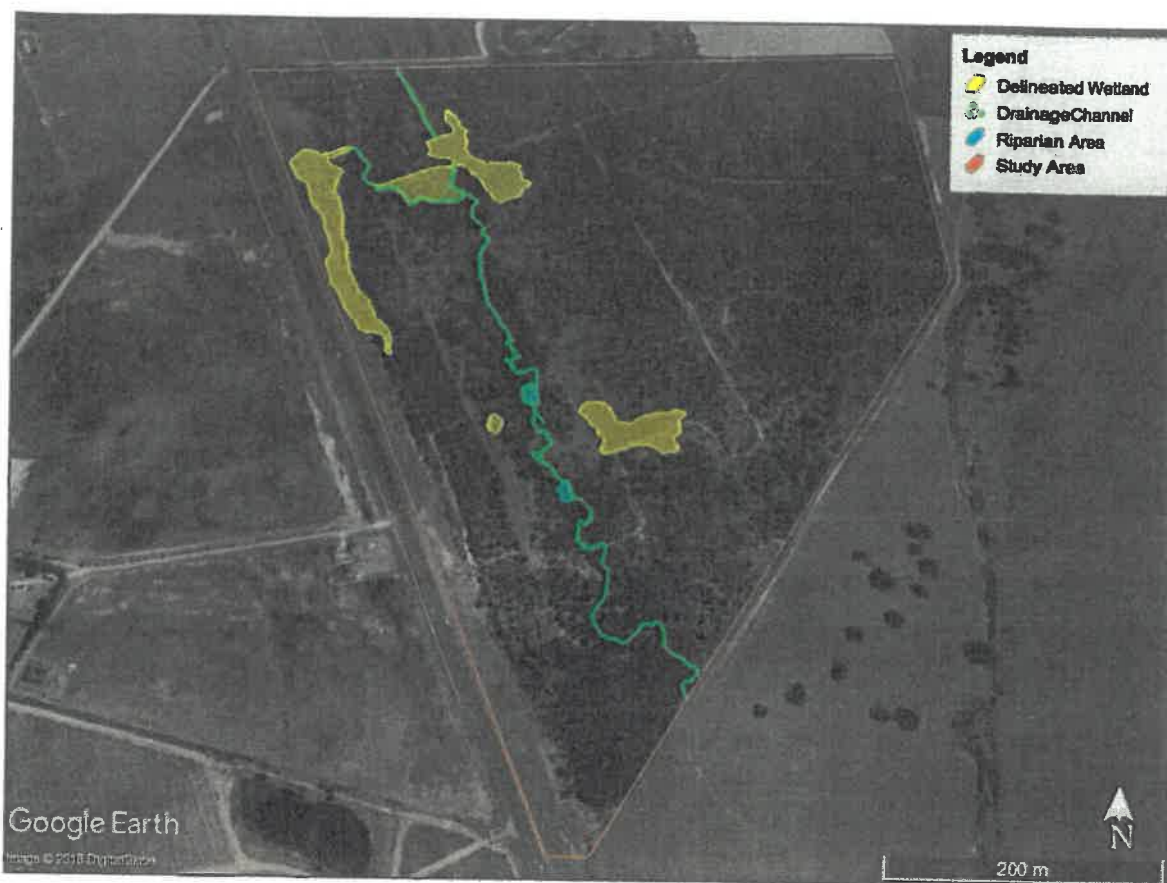
The National Freshwater Ecological Priority Areas (2011) project's indicates the presence of a number of unchanneled valley-bottom wetlands as well as a larger channelled valley-bottom wetland within the 500m regulated area. The National Geospatial Information Service (NGI) indicates a non-perennial drainage line in the western portion of the study area which drains in a south-easterly direction.

The Western Cape Biodiversity Spatial Plan (2017) highlights a number of spatial biodiversity categories. The study area is dominated by aquatic Type 2 Ecological Support Areas (ESA's 2), and contains tracts of Type 1 and Type 2 Critical Biodiversity Areas (CBA's 1 and 2).

### *Freshwater Assessment Results*

Hand augering of Farm 29 was conducted to determine the presence or absence of hydromorphic soil indicators. A number of depression wetlands and a non-perennial drainage line was delineated. Within wetland areas where hydrophytic vegetation was found, wetland soils were dark and exhibited an organic surface layer. Wetland hydrology was also present in some areas along the Farm's western boundary despite the season, with saturated soils and even surface water in places. The non-perennial drainage line exhibited alluvial soils.

The resultant delineations for Farm 29 are presented below:



**Figure A: Freshwater feature delineations on Farm 29, Stellenbosch.**

Wetlands delineated were classified as depression wetlands and were assessed as one HGM unit. The non-perennial drainage line and the depression wetlands were evaluated by means of appropriate methods to determine current Ecological Importance and Sensitivity (EIS), Present Ecological State (PES) and ecosystem services. The drainage line fell within the IHIA Category D, and the mosaic of depression wetlands were determined to have a PES within Category E. The wetlands were found to have a "Low/marginal" EIS, providing ecosystem services primarily in the categories of Phosphate and Nitrate removal.

Given the disturbed nature of the site, a Recommended Ecological Category (REC) of D or C is recommended for the freshwater features. Application of the best practice method for determination of an appropriate minimum buffer found that a buffer of 15m would be appropriate for the freshwater features delineated on site.

#### *Impact Assessment*

Four impacts were assessed given the information presently available, with and without essential mitigation measures applied. The results are presented in the table below:

**Table A: Impact Assessment Results**

Impact 1: Impact on the Flow Regime					
	Intensity	Extent	Duration	Probability of impact occurring	Significance
<b>Construction Phase</b>					
Proposed Layout: Without mitigation	High	Local	Permanent	Definite	High (-ve)
<b>Operational Phase</b>					
Proposed Layout: Without mitigation	High	Local	Permanent	Definite	High (-ve)
<b>Impact 2: Impact on Water Quality</b>					

Alternatives	Intensity	Extent	Duration	Probability of impact occurring	Significance
<b>Construction Phase</b>					
Proposed Layout: Without mitigation	Medium	Local	Long term	Medium	Medium (-ve)
Proposed Layout: With mitigation	Low	Local	Short term	Medium	Very Low (+ve)
<b>Operational Phase</b>					
Proposed Layout: Without mitigation	Low	Local	Long term	Medium	Low (-ve)
Proposed Layout: With mitigation	Low	Local	Long term	Medium	Low (+ve)
<b>Impact 3: Impact on Wetland Habitat</b>					
Alternatives	Intensity	Extent	Duration	Probability of impact occurring	Significance
<b>Construction Phase</b>					
Proposed Layout: Without mitigation	Medium	Local	Permanent	Definite	High (-ve)
Proposed Layout: With mitigation	Low	Local	Short term	Medium	Very Low (+ve)
<b>Operational Phase</b>					
Proposed Layout: Without mitigation	Medium	Local	Long term	Medium	High (-ve)
Proposed Layout: With mitigation	Very Low	Local	Long term	Medium	Very Low (+ve)
<b>Impact 4: Impact on Biota</b>					
Alternatives	Intensity	Extent	Duration	Probability of impact occurring	Significance
<b>Construction Phase</b>					
Proposed Layout: Without mitigation	Medium	Local	Long term	High	Medium (-ve)
Proposed Layout: With mitigation	Low	Local	Short term	Medium	Very Low (+ve)
<b>Operational Phase</b>					
Proposed Layout: Without mitigation	Very Low	Local	Long term	Medium	Very Low (-ve)
Proposed Layout: With mitigation	Very Low	Local	Long term	Medium	Very Low (+ve)
	Intensity	Extent	Duration	Probability of impact occurring	Significance
<b>'No Go Scenario'</b>	Medium	Local	Permanent	High	Medium (-ve)

No cumulative or indirect impacts were identified.

#### *Conclusion and Recommendation*

Impacts were assessed and it was found that, after mitigation, most of the potential impacts were either "Low" or "Very Low". The only impact that was found to have a "High" category rating was on flow regime. The proposed development without mitigation would result in an overall negative impact; however with mitigation measures in place a net positive change from the current land-use (or lack thereof) in terms of freshwater impact is likely. Inclusion and rehabilitation of the wetlands and drainage line, with buffers of 15m, within the parkland would likely result in a further improvement of the proposed development with mitigation measures. Therefore, an adjustment to the proposed layout, with mitigation measures, would be required in order to accommodate the freshwater findings in this report with a net positive change.

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## Disclaimer

EnviroSwift (Pty) Ltd has exercised all due care in the reviewing of all available information. The freshwater assessment provided is entirely reliant on the accuracy and completeness of the provided specialist studies as well as professional judgement. EnviroSwift (Pty) Ltd does not accept responsibility for any errors or omissions in the assessment and therefore does not accept any consequential liability arising from commercial decisions made, which are based on the information contained in this report. Opinions presented in this report apply to conditions/site conditions applicable at time of review and those conditions which are reasonably foreseeable.

## Glossary<sup>1</sup>

<b>Alluvial soil:</b>	A deposit of sand, mud, etc. formed by flowing water, or the sedimentary matter deposited thus within recent times, especially in the valleys of large rivers.
<b>Biodiversity:</b>	The number and variety of living organisms on earth, the millions of plants, animals and micro-organisms, the genes they contain, the evolutionary history and potential they encompass and the ecosystems, ecological processes and landscape of which they are integral parts.
<b>Buffer:</b>	A strip of land surrounding a wetland or riparian area in which activities are controlled or restricted, in order to reduce the impact of adjacent land uses on the wetland or riparian area.
<b>Catchment:</b>	The area contributing to runoff at a particular point in a river system.
<b>Chroma:</b>	The relative purity of the spectral colour which decreases with increasing greyness.
<b>Critical Biodiversity Areas:</b>	Areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services.
<b>Delineation (of a wetland):</b>	To determine the boundary of a wetland based on soil, vegetation and/or hydrological indicators.
<b>Ecoregion:</b>	A recurring pattern of ecosystems associated with characteristic combinations of soil and landform that characterise that region.
<b>Ephemeral stream:</b>	A stream that has transitory or short-lived flow.
<b>Groundwater:</b>	Subsurface water in the saturated zone below the water table.
<b>Habitat:</b>	The natural home of species of plants or animals.
<b>Hue (of colour):</b>	The dominant spectral colour.
<b>Hydromorphic soil:</b>	A soil that, in its undrained condition, is saturated or flooded long enough to develop anaerobic conditions favouring the growth and regeneration

<sup>1</sup> As provided by DWA (2005) and WRC Report No. TT 434/09.

	of hydrophytic vegetation (vegetation adapted to living in anaerobic soils).
<b>Hydrology:</b>	The study of the occurrence, distribution and movement of water over, on and under the land surface.
<b>Hydrophytes:</b>	Also called obligate wetland plants - plants that are physiologically bound to water where at least part of the generative cycle takes place in the water or on the surface.
<b>Halophytes:</b>	Salt tolerant plants.
<b>Helophytes:</b>	Also called facultative wetland plants - essentially terrestrial plants of which the photosynthetically active parts tolerate long periods of submergence or floating on water.
<b>Indicator species:</b>	A species whose presence in an ecosystem is indicative of particular conditions (such as saline soils or acidic waters).
<b>Intermittent flow:</b>	Flows only for short periods.
<b>Macrophyte:</b>	A large plant - in wetland studies usually a large plant growing in shallow water or waterlogged soils.
<b>Perennial:</b>	Permanent - persisting from year to year.
<b>Riparian area delineation:</b>	The determination and marking of the boundary of the riparian area.
<b>Riparian habitat:</b>	Includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterized by alluvial soils (deposited by the current river system) and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent areas.
<b>Shrub:</b>	A shrub is a small to medium-sized woody plant.
<b>Temporary zone:</b>	The zone that is alternately inundated and exposed.
<b>Terrain unit morphological classes:</b>	Areas of the land surface with homogenous form and slope.
<b>Watercourse (NWA):</b>	<ul style="list-style-type: none"> <li>(a) A river or spring;</li> <li>(b) A natural channel in which water flows regularly or intermediately;</li> <li>(c) A wetland, lake or dam into which or from which water flows; and</li> <li>(d) Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse.</li> </ul>
<b>Water table:</b>	The upper surface of groundwater or that level below which the soil is saturated with water. The water table feeds base flow to the river channel network when the river channel is in contact with the water table.
<b>Wetland:</b>	An area of marsh, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed ten metres.

## Acronyms

<b>CCT</b>	City of Cape Town
<b>CBA</b>	Critical Biodiversity Area
<b>DWA</b>	Department of Water Affairs
<b>DWAF</b>	Department of Water Affairs and Forestry
<b>DWS</b>	Department of Water and Sanitation
<b>EIS</b>	Ecological Importance and Sensitivity
<b>FEPA</b>	Freshwater Ecological Support Area
<b>GPS</b>	Global Positioning System
<b>HGM</b>	Hydrogeomorphic
<b>IHI</b>	Index of Habitat Integrity



<b>IHIA</b>	Intermediate Habitat Integrity Assessment
<b>MAP</b>	Mean Annual Participation
<b>NEMA</b>	National Environmental Management Act
<b>NFEPA</b>	National Freshwater Ecosystem Priority Areas
<b>NWA</b>	National Water Act
<b>OESA</b>	Other Ecological Support Area
<b>PES</b>	Present Ecological State
<b>QDS</b>	Quarter Degree Square
<b>REC</b>	Recommended Ecological Category
<b>SANBI</b>	South African National Biodiversity Institute
<b>Sub-WMA</b>	Sub - Water Management Area
<b>VEGRAI</b>	Riparian Vegetation Response Assessment Index
<b>WCBF</b>	Western Cape Biodiversity Framework
<b>WMA</b>	Water Management Area
<b>WUL</b>	Water Use Licence

## Specialist Details and Experience

### **Joshua Gericke (Pr.Sci.Nat. 117997)**

Joshua holds a Bachelor of Science Honours degree in Environmental Management from the University of Cape Town and graduated in 2008. He has completed several short courses in freshwater, estuarine and coastal resource management and in identification of freshwater and marine fish, birds and plants. He has more than 8 years of experience in management of freshwater, estuarine and coastal systems with the City of Cape Town. He has also consulted periodically on topics related to freshwater, estuarine and coastal ecology and management since 2010, and in 2017 began consulting full time.

### **Jocelyn Anderson (Cand.Sci.Nat. Registration pending)**

Jocelyn graduated from the University of Cape Town with a Bachelor of Science degree in Applied Biology, and Ecology & Evolution. She later went on to complete her honours in Environmental Management from the University of South Africa. Jocelyn has just over two years of experience working in the nature conservation field where she has honed her bird and plant identification skills. Jocelyn began consulting part-time in the beginning of 2018 and has working experience in wetland assessments, wetland delineations, and risk assessments.

### **Natasha van de Haar (Pr.Sci.Nat. 400229)**

Natasha is a registered Professional Natural Scientist (Pr.Sci.Nat) with the South African Council for Natural Scientific Professions (SACNASP). She also holds a Masters Degree in Science (M.Sc.) in the field of Botany. Over the course of Natasha's career, she completed a number of floral identification short courses and also obtained a certificate of competence for wetland assessments from Rhodes University. She is also a member of the South African Wetland Society, Botanical Society of SA as well as the Western Cape Wetlands Forum.

Her career kicked off as a field ecologist in 2009, focusing on floral biodiversity and ecological functioning, with special mention of wetland ecology and functioning within South Africa (all provinces). She further worked as a specialist project member in Mauritius, Lesotho and Ghana. During the course of her career she obtained extensive experience in conducting terrestrial as well as wetland related surveys in the mining, residential and infrastructure development industries as well as development of several alternative energy facilities. Natasha also gained experience in Biodiversity Offset Initiatives as well as RDL/protected plant permit applications. Presently her main focus is wetland assessments including delineation as well as present ecological state and function assessments.

# 1 Introduction

## 1.1 Project Background

EnviroSwift Western Cape has been appointed to undertake a specialist freshwater assessment of the freshwater features on Calcutta, Farm 29 in Stellenbosch, Western Cape (refer to Figure 1 for location). The freshwater assessment is required to inform the Basic Assessment process undertaken in terms of the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) regulations (GN326 of 2017) and the application for a water use authorisation in terms of Section 21 of the National Water Act (NWA, 1998).

Stellenbosch Municipality proposes establishment of a memorial park on Calcutta, Farm 29, Stellenbosch. The site is currently not being utilised and is dominated by alien invasive vegetation such as *Lolium perenne*, *Acacia saligna*, and *Eucalyptus* species.

A proposed layout of the development of Farm 29 has been provided (refer to Figure 2 below). The proposed layout is not final however and this report will inform the final layout.

The proposed memorial park development will however include the following:

- Construction of hardened infrastructure including a chapel, office, columbarium, public toilets, an access road and hardened pathways;
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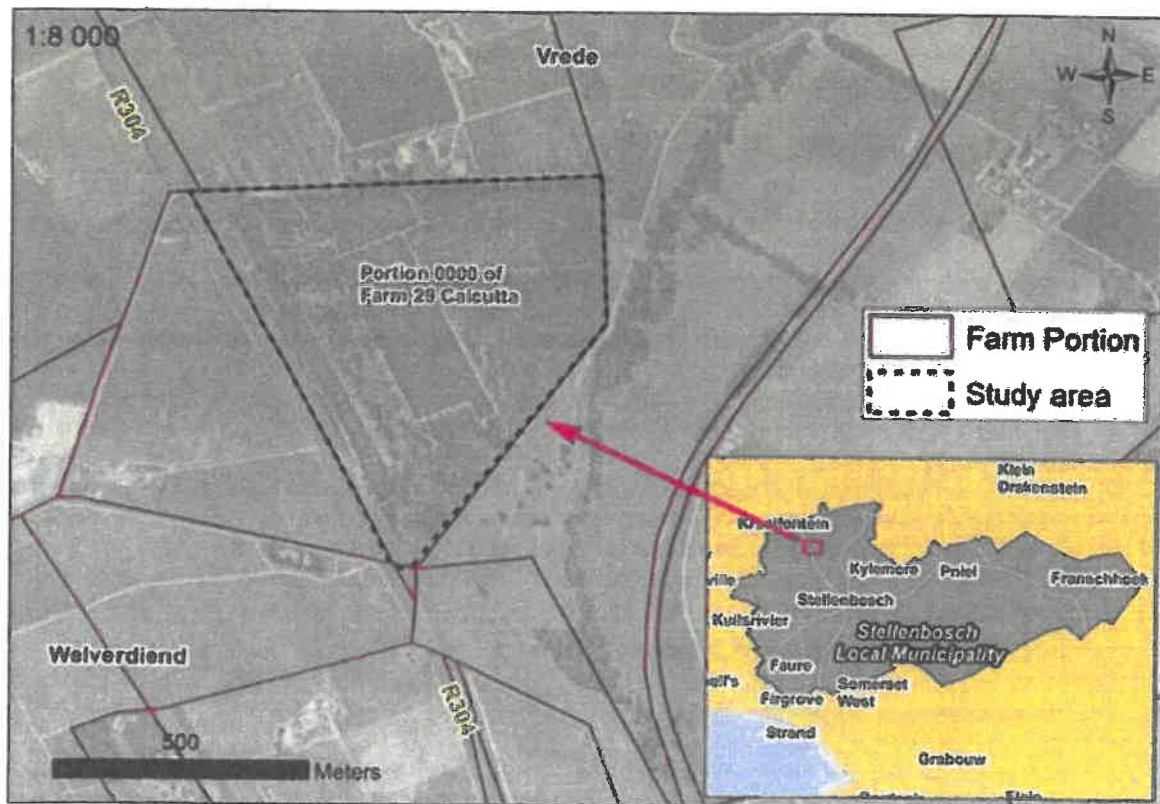


Figure 1: Location of the study area within Stellenbosch Local Municipality.

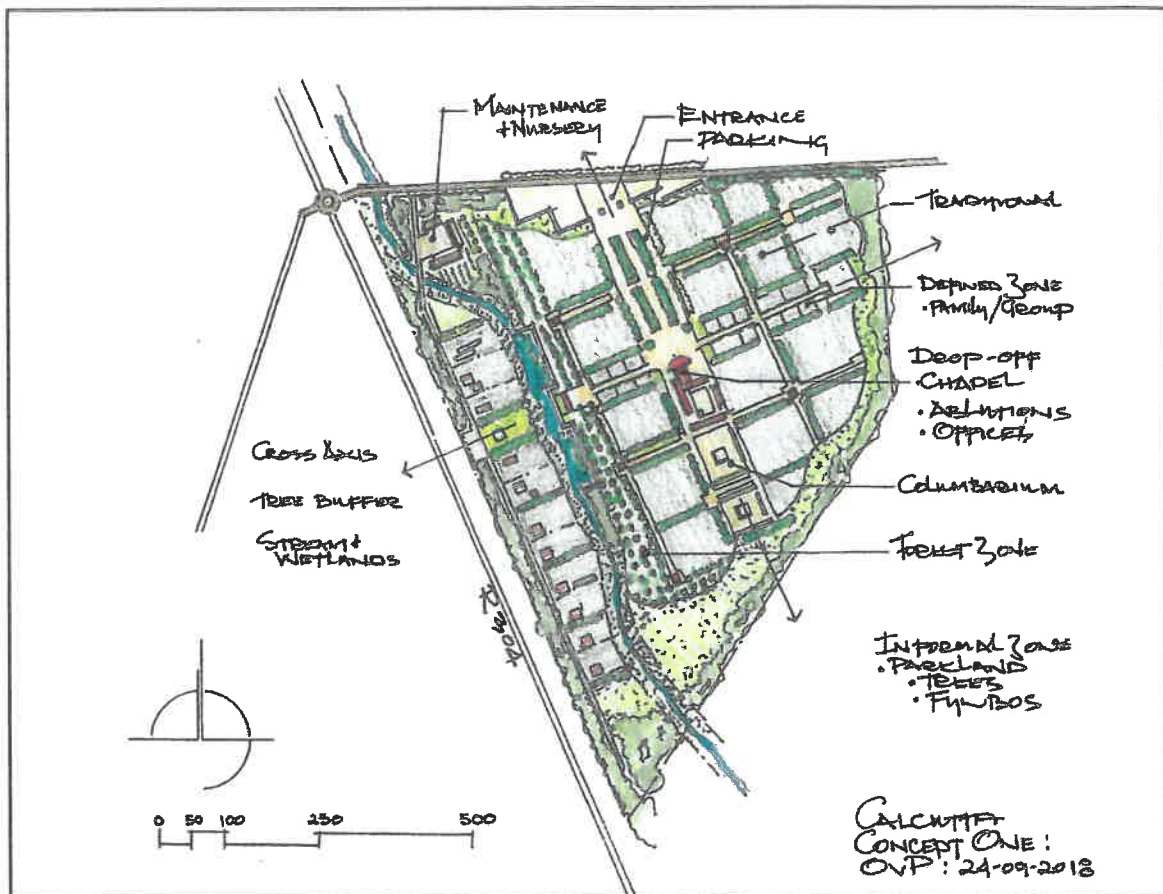


Figure 2: Calcutta concept draft on Farm 29, Stellenbosch.

## 1.2 Scope of Work

The scope of work which informs this assessment consists of:

- Assessment of relevant background information including the National Freshwater Ecological Database (NFEPA, 2011), the Western Cape Biodiversity Spatial Plan (WCBS, 2017), the National Geospatial Information (NGI) Service topographical maps and vector data, and pertinent academic resources;
- A site assessment including delineation of wetland boundaries in accordance with best practice guidelines such as (Department of Water Affairs and Forestry - DWAF, 2008) and Job, et. al. (2009);
- Assessment of the Present Ecological State (PES), Ecological Importance and Sensitivity (EIS) and wetland ecosystem services according to best practice methods;
- Assessment of freshwater impacts and potential mitigation measures; and
- Clarification of the potential freshwater legislative constraints applicable to the development.

## 1.3 Limitations and Assumptions

The following limitations apply to this study.

- A Garmin E-Trex 20 GPS was used to delineate any wetlands identified on the site and accuracy is therefore limited to the stated accuracy of the GPS of approximately 3m. All effort is made to improve on the stated accuracy including the use of the waypoint averaging function at the most critical points. It is however the opinion of the specialist that this limitation is of no material significance and that the freshwater constraints have been adequately identified.

- This study is limited to the upper 50cm of soil in accordance with the Updated Manual for Identification and Delineation of Wetland and Riparian Areas (Department of Water Affairs and Forestry - DWAF, 2008) and the Application of the DWAF (2008) Method to Wetland Soils of Western Cape (Job *et. al.* 2009).
- A single site assessment was conducted on 9 November 2018 during early summer; therefore, comments on hydrology are limited.
- The site has undergone extensive disturbance, resulting in limited indigenous vegetation and cryptic soils. The site can be considered a difficult case due to the degree of transformation and the lack of natural vegetation. A follow up site assessment is recommended during winter, after site clearing (refer to conclusion).

## 1.4 Applicable Legislation

### 1.4.1 National Water Act (36 of 1998)

The purpose of the NWA is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors -

- (g) protecting aquatic and associated ecosystems and their biological diversity; and
- (h) reducing and preventing pollution and degradation of water resources.

In order to understand and interpret the Act correctly, the following definitions are applicable to this project:

**"pollution"** means the direct or indirect alteration of the physical, chemical or biological properties of a water resource;

**"protection"**, in relation to a water resource, means -

- (a) maintenance of the quality of the water resource to the extent that the water resource may be used in an ecologically sustainable way;
- (b) prevention of the degradation of the water resource; and
- (c) the rehabilitation of the water resource;

**"resource quality"** means the quality of all the aspects of a water resource including -

- (a) the quantity, pattern, timing, water level and assurance of instream flow;
- (b) the water quality, including the physical, chemical and biological characteristics of the water;
- (c) the character and condition of the instream and riparian habitat; and
- (d) the characteristics, condition and distribution of the aquatic biota;

**"watercourse"** means -

- (a) a river or spring;
- (b) a natural channel in which water flows regularly or intermittently;
- (c) a wetland, lake or dam into which, or from which, water flows; and
- (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks; and

**"water resource"** includes a watercourse, surface water, estuary, or aquifer.

The NWA deals with pollution prevention, and in particular the situation where pollution of a water resource occurs or might occur as a result of activities on land. The person who owns, controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources. The measures may include measures to -

- (a) cease, modify or control any act or process causing the pollution;
- (b) comply with any prescribed waste standard or management practice;
- (c) contain or prevent the movement of pollutants;
- (d) eliminate any source of the pollution;
- (e) remedy the effects of the pollution; and
- (f) remedy the effects of any disturbance to the bed and banks of a watercourse.

Water use is defined broadly, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. In general a water use must be licensed unless it is listed in Schedule I, is an existing lawful

use, is permissible under a general authorisation, or if a responsible authority waives the need for a licence.

### **1.4.2 General Notice 509 (2016) of the NWA**

According to GN509 of 2016 the extent of a watercourse means:

a) a river, spring or natural channel in which water flows regularly or intermittently "within the outer edge of the 1 in 100 year floodline or riparian habitat measured from the middle of the watercourse from both banks", and for b) wetlands and pans "within a 500 m radius from the boundary (temporary zone) of any wetland or pan" (when the temporary zone is not present then the seasonal zone is delineated as the wetland boundary), and for c) lakes and dams "purchase line plus a buffer of 50 m".

According to the GN509 a General Authorisation (GA) may be acquired for the use of water in terms of section 21 c and i within the regulatory zone of a watercourse where the Risk Class as determined by the Risk Assessment Matrix is Low.

### **1.4.3 National Environmental Management Act (107 of 1998)**

The NEMA states the following:

"Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment."

The Act also makes special mention of the importance of the protection of wetlands:

"Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure."

## **2 Method of Assessment**

### **2.1 Desktop Assessment**

Desktop resources and databases were consulted in order to contextualise the study area and findings of the field survey. Spatial and non-spatial resources accessed for this assessment include inter alia the NFEPA, (2011), the WCBSP (2017), as well as maps and vector data from the National Geospatial Information directorate. The WCBSP (2017) categorises natural features into Protected Areas (PAs), Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs), and Other Natural Areas (ONAs). These categories, as well as the applicable sub-categories, are defined in the table overleaf.

**Table 1: WCBSP category definitions and management objectives.**

MAP CATEGORY	DEFINITION	DESIRED MANAGEMENT OBJECTIVE	SUB-CATEGORY
Protected Area	Areas that are proclaimed as protected areas under national or provincial legislation	Must be kept in a natural state with a management plan focused on maintaining or improving the state of biodiversity. A benchmark for biodiversity	n/a
Critical Biodiversity Area 1	Areas in a natural condition that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure	Maintain in a natural or near-natural state with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact biodiversity-sensitive land uses are appropriate	CBA Forest CBA Estuary CBA Wetland CBA Fossil CBA Mining
Critical Biodiversity Area 2	Areas in a degraded or secondary condition that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure	Maintain in a functional natural or near-natural state with no further loss of natural habitat. These areas should be rehabilitated	CBA Degraded
Ecological Support Area 1	Areas that are not essential for meeting biodiversity targets but that play an important role in supporting the functioning of PAs or CBAs and are often vital for delivering ecosystem services	Maintain in a functional near-natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised	ESA Foredune ESA Forest ESA Climate Adaptation Corridor ESA Coastal Resource Protector ESA Endangered Ecosystem ESA River ESA Estuary ESA Wetland ESA Watercourse Protection ESA Water Source Protection ESA Water Recharge Protection
Ecological Support Area 2	Areas that are not essential for meeting biodiversity targets but that play an important role in supporting the functioning of PAs or CBAs and are often vital for delivering ecosystem services	Restore and/or manage to minimize impact on ecological infrastructure functioning especially soil and water-related services	ESA Restore From NIN
ONA Natural to Near-Natural	Areas that have not been identified as a priority in the current systematic biodiversity plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for biodiversity they are still an important part of the natural ecosystem	Minimize habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in economic land uses but some rehabilitation may still be required for high-impact land uses	ONA Natural to Near-Natural ONA Degraded
No Natural Remaining	Areas that have been modified to the extent that they are no longer natural and do not contribute to biodiversity targets. These areas may still provide limited biodiversity and ecological infrastructure functions even if they are never prioritised for conservation action	Manage in a biodiversity-sensitive manner aiming to retain some ecological functionality. Offers the most flexibility regarding potential land uses but some additional measures may still be required for high-impact land uses	No Natural Remaining

## 2.2 Watercourse Identification and Delineation

A field survey of the study area was undertaken on 9 November 2018. For the purpose of the identification of water resources, the definition as provided by the NWA (Act no. 36, 1998) was used to guide the field survey. The NWA defines a water resource as a watercourse, surface water, estuary or aquifer, of which the latter two are not applicable to this assessment due to an estuary being associated with the sea and, in line with best practice guidelines, wetland and riparian assessments only include

the assessment of the first 50 cm from the soil surface, therefore aquifers are excluded. In addition, reference to a watercourse as provided above includes, where relevant, its bed and banks.

In order to establish if watercourses can be classified as 'wetland habitat' or 'river habitat', the definitions as drafted by the NWA (Act no. 36, 1998)<sup>2</sup> were taken into consideration:

- A 'wetland' is land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil; and
- 'Riparian' habitat includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterized by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent areas'.

Freshwater habitat was identified with the use of the definitions provided above and the delineation took place according to the method supplied by DWAF (2005, updated 2008). Several indicators are prescribed in the watercourse delineation guideline to facilitate the delineation of either the temporary wetland zone or the rivers riparian zone. Refer to Figure 3 and Figure 4.

Indicators used to determine the boundary of the wetland temporary zone include:

- 1) The position in the landscape;
- 2) The type of soil form;
- 3) The presence of wetland vegetation species; and
- 4) The presence of redoximorphic soil features, which are morphological signatures that appear in soils with prolonged periods of saturation.

Indicators used to determine the boundary of the riparian zone include:

- 1) Landscape position;
- 2) Alluvial soils and recently deposited material;
- 3) Topography associated with riparian areas; and
- 4) Vegetation associated with riparian areas.

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<sup>2</sup> The definitions as provided by the NWA (Act No. 36 of 1998) are the only legislated definitions of wetlands in South Africa.



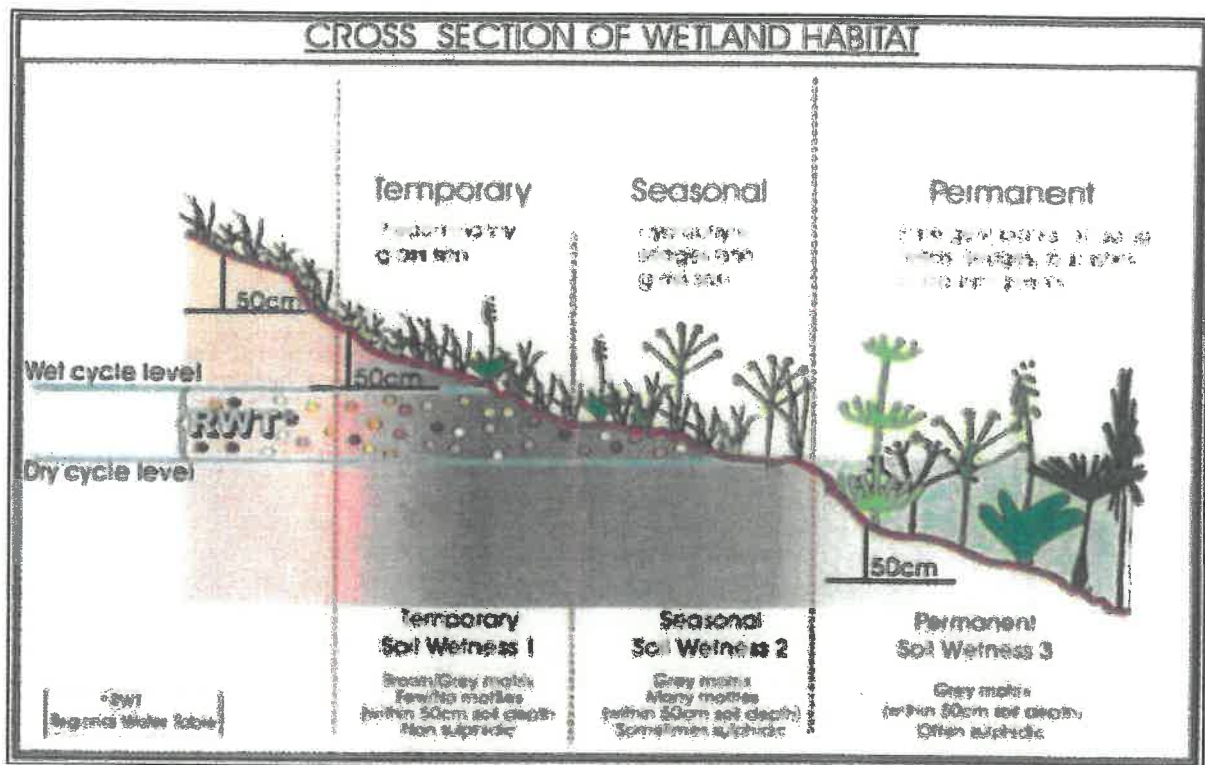


Figure 3: Cross section through a wetland (after DWAF, 2005).

Table 2: Vegetation characteristics used in the delineation of wetlands (after DWAF, 2005).

Terrestrial / Non wetland	Temporary	Seasonal	Permanent / Semi-permanent
Dominated by plant species which occur extensively in non-wetland areas; hydrophytic <sup>3</sup> species may be present in very low abundance	Predominantly grass species; mixture of species which occur extensively in non-wetland areas and hydrophytic plant species which are restricted largely to wetland areas	Hydrophytic sedge and grass species which are restricted to wetland areas	Dominated by emergent plants, including reeds, sedges and bulrushes or floating or submerged aquatic plants

<sup>3</sup> Plants that are physiologically bound to water where at least part of the generative cycle takes place in the water or on the surface.

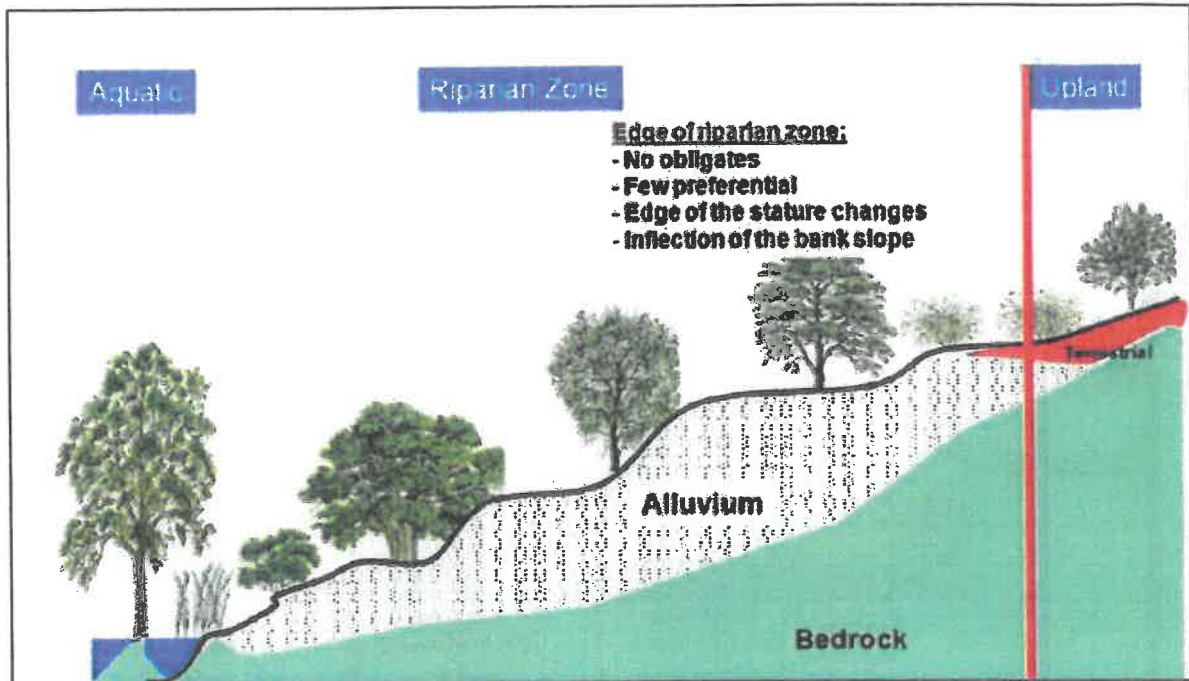


Figure 4: A schematic diagram illustrating the edge of the riparian zone on one bank of a large river (DWA, 2008).

## 2.3 Freshwater Feature Classification

Ecosystems included within the 'Classification System for Wetlands and other Aquatic Ecosystems in South Africa' (hereafter referred to as 'the Classification System') developed by Ollis *et. al.*, (2013) encompass those that the Ramsar Convention defines, rather broadly, as 'wetlands', namely areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres (cited by Ramsar Convention Secretariat, 2011). The inland component of the Classification System has a six-tiered structure presented in the figure below.

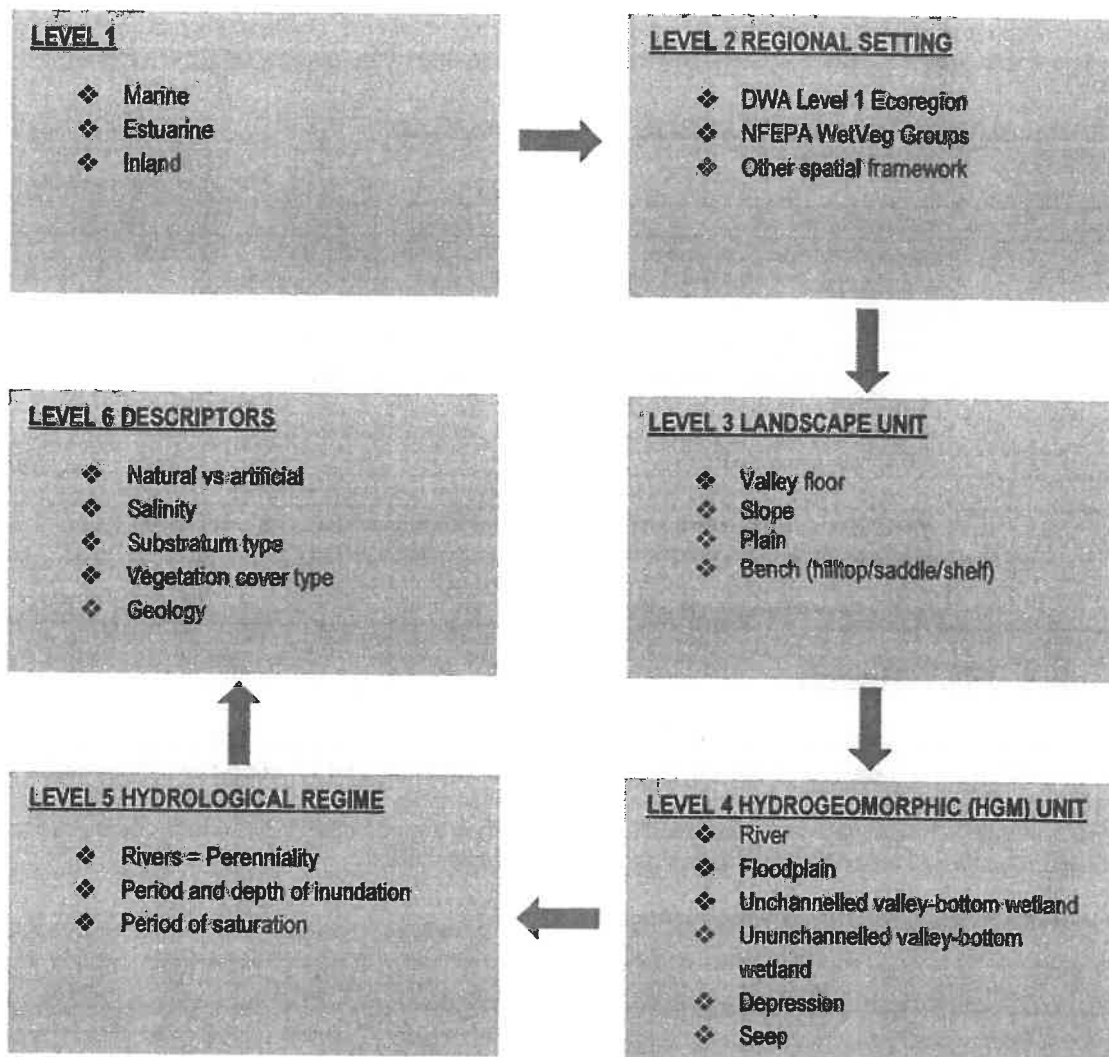


Figure 5: Classification System for wetlands and other aquatic ecosystems in South Africa.

## 2.4 Ecosystem Services

WET-EcoServices (Kotze *et al.* 2007) was designed for inland palustrine wetlands and has been developed to help assess 15 key goods and services that individual wetlands provide in order to allow for more informed planning and decision making. Central to WET-EcoServices is the characterisation of Hydrogeomorphic (HGM) units by which the wetland can be divided into units of a similar character. The rationale behind characterising the HGM units of a wetland is that areas belonging to the same HGM type and falling within a similar geological and climatic setting are likely to have a similar structure and exhibit similar processes.

In addition, WET-EcoServices allows for the assessment of potential and actual ecosystem service outcomes of rehabilitation projects by applying the assessment to 'with rehabilitation' and 'without rehabilitation' situations and comparing the difference between the two.

## 2.5 Present Ecological State (PES)

The river IHIA is utilised in order to determine the PES of rivers. The river IHIA is based on two components of the watercourse, the riparian zone and the instream channel. Assessments are made separately for both aspects, but data for the riparian zone is primarily interpreted in terms of the potential impact on the instream component. The method involves the rating of the perceived modification of nine

instream criteria and eight riparian criteria against a set scoring guideline. The final score is derived by calculating the average scores, which places the final score in one of the categories listed below.

**Table 3: Intermediate habitat integrity categories (From Kleynhans, 1996).**

CATEGORY	DESCRIPTION	SCORE (% OF TOTAL)
A	Unmodified, natural.	90-100
B	Largely natural with few modifications. A small change in natural habitats and biota may have taken place but the ecosystem functions are essentially unchanged.	80-90
C	Moderately modified. A loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged.	60-79
D	Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred.	40-59
E	The loss of natural habitat, biota and basic ecosystem functions is extensive.	20-39
F	Modifications have reached a critical level and the lotic system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions have been destroyed and the changes are irreversible.	0

## 2.6 WET-Health

WET-Health (Macfarlane, 2007) is a tool designed to assess the health or integrity of a wetland. Wetland health is defined as a measure of the deviation of wetland structure and function from the wetland's natural reference condition. This technique attempts to assess hydrological, geomorphological and vegetation health in three separate modules. The modules may then be combined to determine A Level 1 WET-Health assessment was undertaken as part of this assessment.

**Table 4: Descriptions of WET-Health score categories.**

Description	Combined impact score	PES Category
Unmodified, natural.	0-0.9	A
Largely natural with few modifications. A slight change in ecosystem processes is discernable and a small loss of natural habitats and biota may have taken place.	1-1.9	B
Moderately modified. A moderate change in ecosystem processes and loss of natural habitats has taken place but the natural habitat remains predominantly intact	2-3.9	C
Largely modified. A large change in ecosystem processes and loss of natural habitat and biota and has occurred.	4-5.9	D
The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable.	6-7.9	E
Modifications have reached a critical level and the ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota.	8-10	F

## 2.7 Ecological Importance and Sensitivity (EIS)

The EIS method applied to wetlands is based on the assessment tool developed by Rountree et al (2014) and was used to determine the ecological importance and sensitivity of wetlands, incorporating the traditionally examined criteria used in EIS assessments of other water resources by the Department of Water Affairs (DWA) and thus enabling consistent assessment approaches across water resource types.

Hydro-functional importance and basic human needs have been assessed as part of the WET-EcoServices and were therefore excluded. In the method a series of determinants are assessed on a scale of 0 to 4, where "0" indicates no importance and "4" indicates very high importance.

## 2.8 Recommended Ecological Category (REC)

The Recommended Ecological Category (REC) is determined by the PES score as well as importance and/or sensitivity. Water resources which have a PES falling within an E or F ecological category are deemed unsustainable. In such cases the REC must automatically be increased to a D. Where the PES is determined to be within an A, B, C or D ecological category, the EIS components must be evaluated to determine if any of the aspects of importance and sensitivity are high or very high. If this is the case, the feasibility of increasing the PES (particularly if the PES is in a low C or D category) should be evaluated and either set at the same ecological category or higher depending on feasibility. This is recommended to enable important and/or sensitive water resources to maintain their functionality and continue to provide the goods and services for the environment and society.

## 2.9 Impact Assessment

A method of assessment summary is provided below; the detailed method is provided in Appendix 1.

The following criteria were taken into consideration when determining the impact of the proposed activities:

- The nature of the impact i.e. positive, negative, direct, indirect;
- The extent and location of the impact;
- The duration of the impact i.e. short term, long term, intermittent or continuous;
- The magnitude/intensity of the impact i.e. high, medium, low; and
- The likelihood or probability of the impact occurring.

Mitigation measures were subsequently identified and recommended for all impacts to reduce the overall impact significance to an acceptable level, where and if possible. Mitigation measures were aimed to ensure that:

- More environmentally sound designs / layouts / technologies, etc., are investigated and implemented, if feasible;
- Environmental benefits of a proposed activity are enhanced;
- Negative impacts are avoided, minimised or remedied; and
- Residual negative impacts are within acceptable levels.

## 3 Results

### 3.1 Desktop Assessment

#### 3.1.1 Regional and Local Setting

The study area lies in Southwestern Coastal Belt ecoregion, the main features of which are summarised in Table 5. Local climatic, topographic and soil conditions for the study area are shown by Table 6, which is adapted from the Cape Farm Mapper website (<https://gis.elsenburg.com/apps/cfm/>). The study area is furthermore within the Berg Water Management Area (WMA), the Greater Cape Town Sub-WMA and the G22G quaternary catchment.

The applicable terrestrial vegetation type is Swartland Shale Renosterveld which is listed as Critically Endangered according to the National Vegetation Map (Mucina & Rutherford, 2006, revised 2009 and 2012, refer to Figure 6). The National Freshwater Ecological Priority Areas (NFEPAs, 2011) project's applicable Wetland Vegetation type is West Coast Shale Renosterveld (Figure 7), within which all wetland types are listed as Critically Endangered.

The low clay content, mid soil depth, mediocre rainfall and relatively flat topography within the study area mean that wetland conditions are expected to be associated with depressions and drainage lines, but seeps are not likely to be common.

The topography of the study area is largely flat at an elevation of between 142 and 157 metres above mean sea-level (AMSL). The study area falls largely from east to west at gradients of between 0 and 10%, but with artificially infilled high ground in the southwest (refer to Figure 8).

**Table 5: Overview of the Southwestern Coastal Belt Ecoregion (adapted from DWA, 2005)**

Main Attributes	Southwestern Coastal Belt
Geology	Granite, quartzitic sandstone, quartzite, conglomerate, slate
Vegetation	Sand Plain Fynbos; Mountain Fynbos; West Coast Renosterveld; Dune Thicket; Strandveld Succulent Karoo
Landscape	Closed hills; mountains; moderate and high relief
Mean altitude	300-900
Rainfall seasonality	Winter

**Table 6: Local climate, topography and soil conditions (adapted from Cape Farm Mapper, 2015)**

Parameters	Local Conditions
Mean annual precipitation (mm)	519 mm
Mean annual runoff (mm/annum)	58.6 mm
Mean annual temperature (°C)	16.7° C
Elevation (m above mean sea level)	140-145m
Slope classification (%)	0-10%
Soil characteristics	Soils with a marked clay accumulation, strongly structured and a non-reddish colour. In addition one or more of vertic, melanic and plinthic soils may be present. Soils are expected to be overlain by quartzitic sand of the springfontein formation
Soil depth (mm)	>= 450 mm and < 750 mm
Soil clay content (%)	< 15%

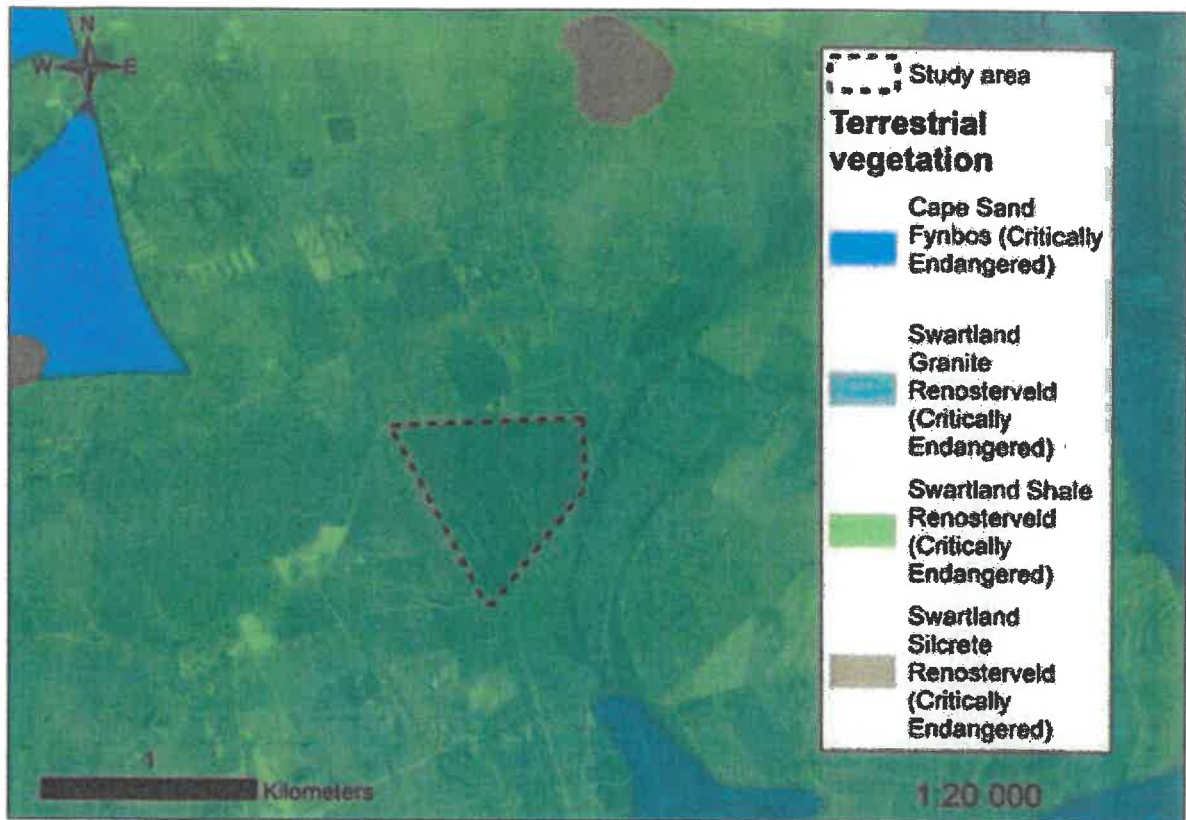


Figure 6: Terrestrial vegetation types according to the National Vegetation Map (Mucina and Rutherford, 2006; updated 2012).

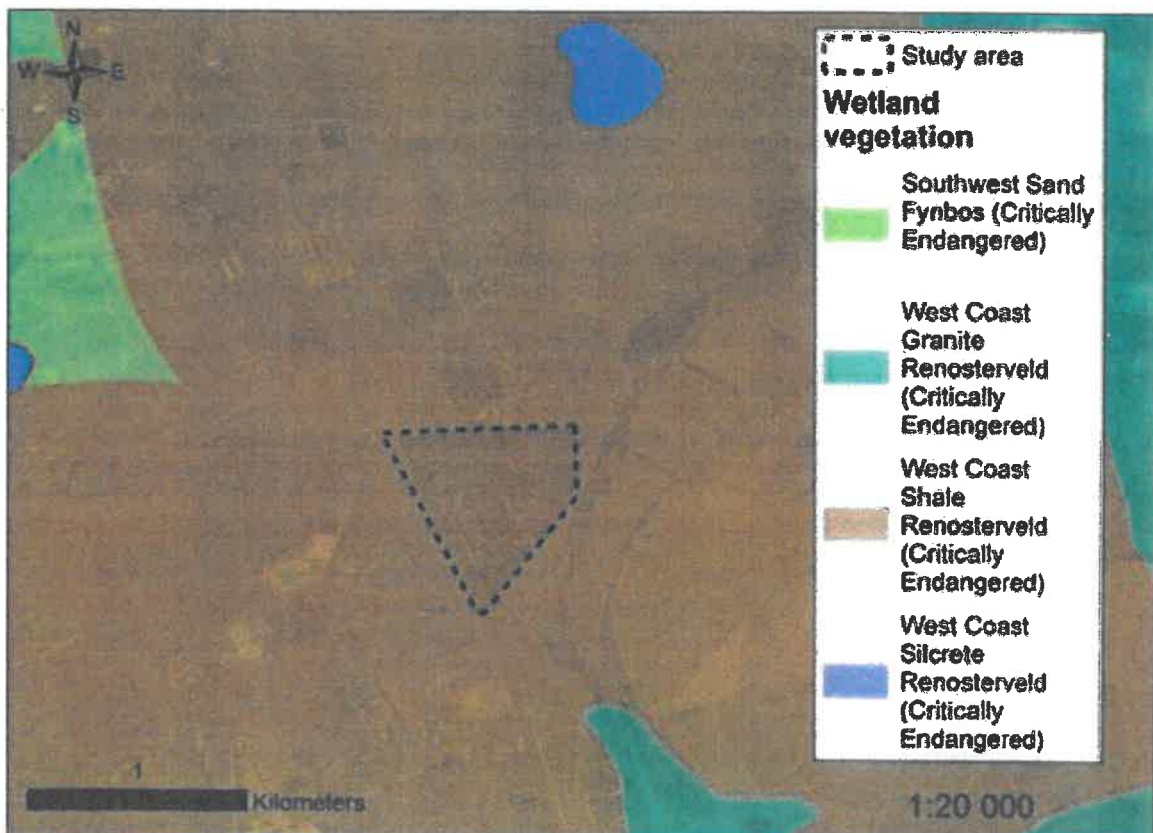


Figure 7: Wetland vegetation types according to NFEPA (2011).

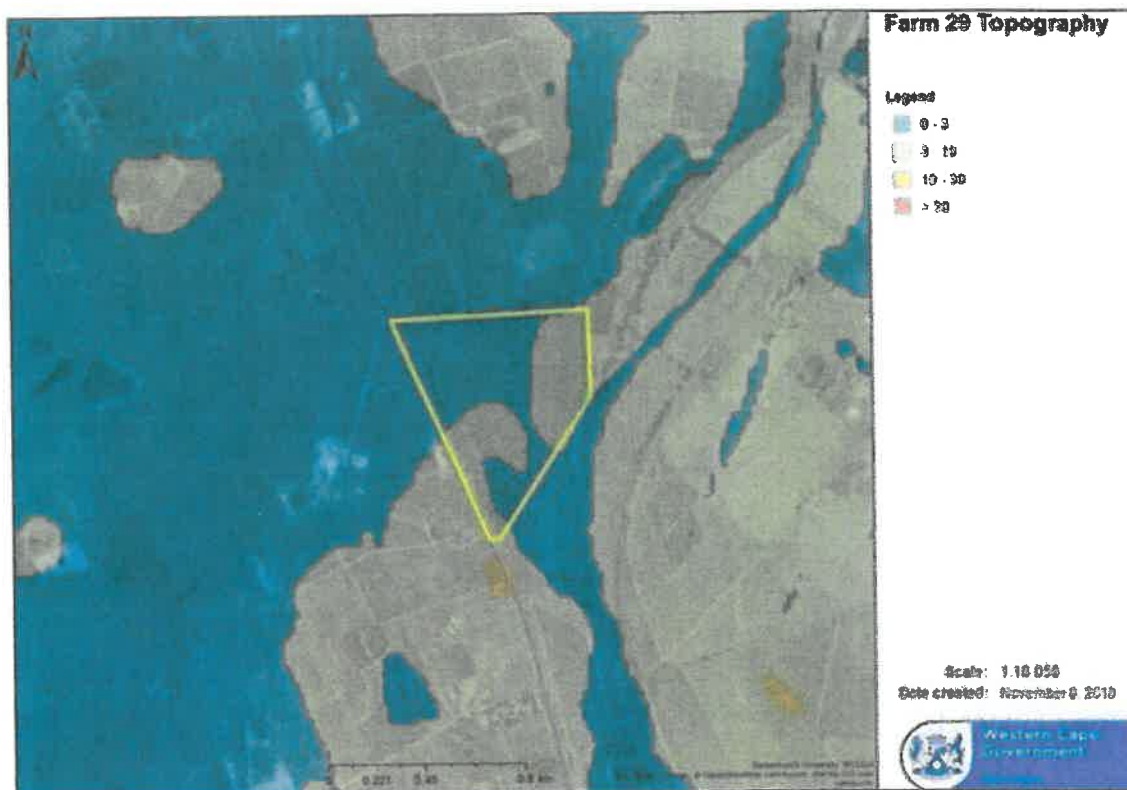


Figure 8: Topography of the study area (indicated in yellow) and surrounds (Cape Farm Mapper, 2018)

### 3.1.2 Watercourses within 500m

The NWA (1988) defines a regulated area of 500m around wetlands, within which risks to these wetlands must be considered. Additionally, the NWA requires that risks to rivers, streams and drainage lines are also considered within a regulated area defined by the 1:100- year floodline. Floodlines are not available in this case, so all known rivers, streams, drainage lines and wetlands, within 500m of the study area, according to the available desktop resources, are presented below.

Within the 500m regulated area, the NFEPA wetland layer (2011) indicates the presence of a number of unchanneled valley-bottom wetlands as well as a larger channelled valley-bottom wetland within the 500m regulated area (refer to Figure 9). In addition, the National Geospatial Information Service (NGI) topo-cadastral map indicates a non-perennial drainage line in the western portion of the study area which drains in a south-easterly direction, refer also to Figure 9.

According to the WCBSP (2017) the study area intersects a number of spatial biodiversity categories. Figure 10 depicts the spatial location of the study area relative to the categories described by Table 1, and shows that the study area is dominated by the ESA 2 category, and contains elements of CBA 2 and CBA 1 as well. The possibility of wetland CBA 1 features is also highlighted by Figure 10. The presence of threatened vertebrate and plant species, and the role played by natural vegetation in water resources protection within the critically endangered Renosterveld vegetation type are the reasons cited by the WCBSP (2017) for the relatively high conservation value of the study area.



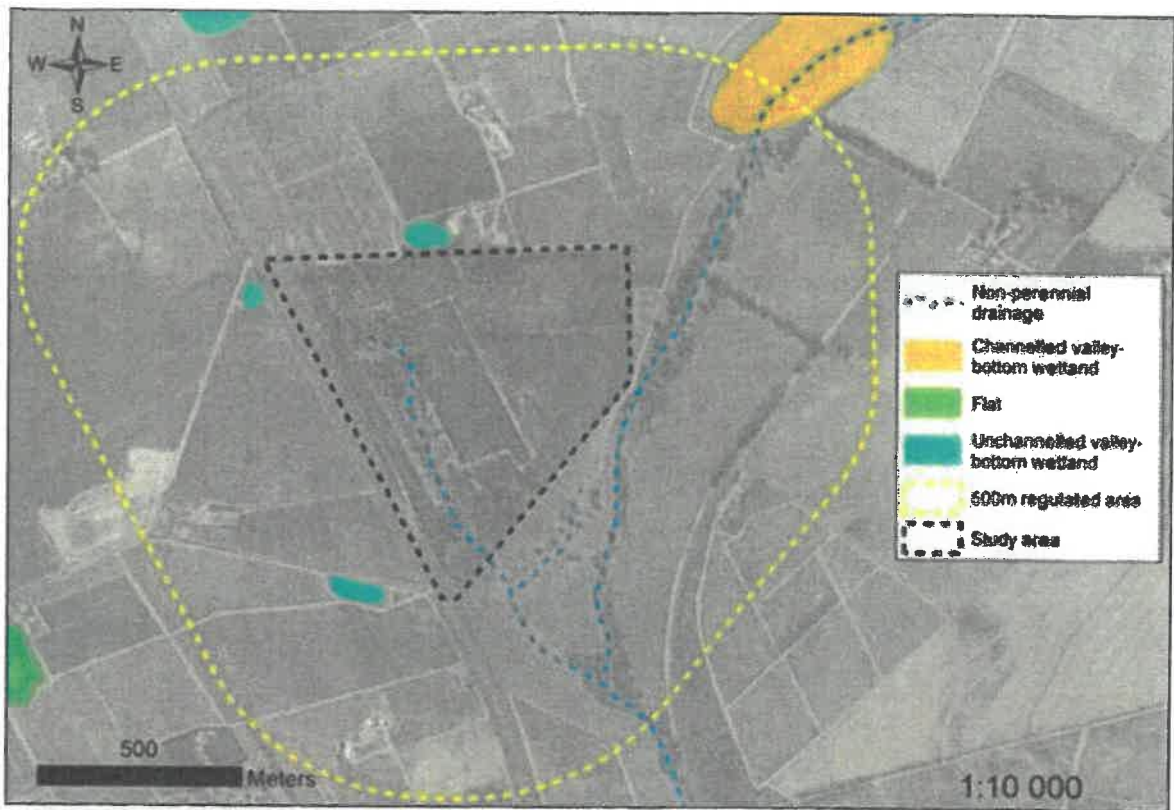


Figure 9: Known watercourses within 500m of the study area

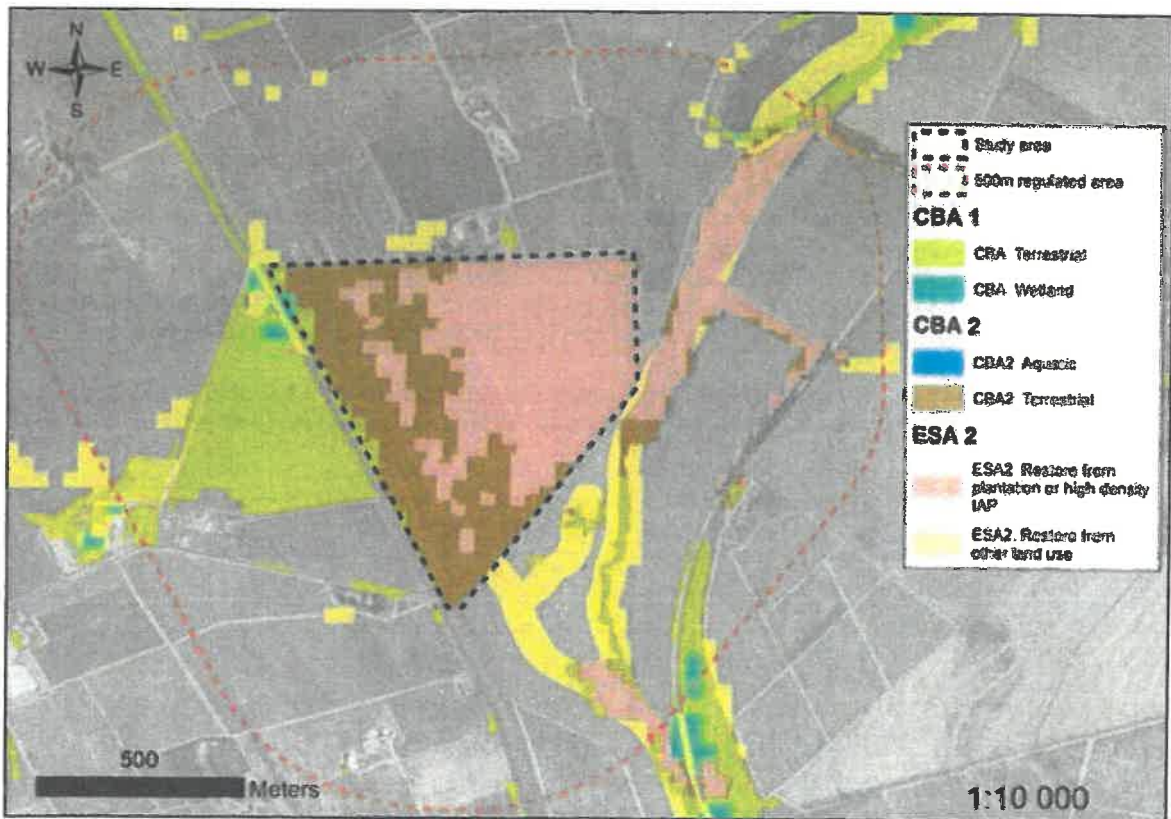


Figure 10: Location of the study area relative to spatial biodiversity categories (WCBS, 2017)

## 3.2 Site Description

### 3.2.1 Soil

Hand augering was conducted within areas where other possible wetland indicators such as hydrophytic vegetation or a fractured soil surface were found to locate and determine the outer boundary of freshwater features on site and in order to discern between wetland and riverine conditions.

Terrestrial soils were uniform and brown and exhibited a high clay content. Wetland soils were darker and exhibited an organic surface layer (refer to Figure 11). Wetland hydrology was also present despite the season, with saturated soils and even surface water in places. Surprisingly, the soils did not mottle even where seasonal wetland hydrology was clearly evident. Soils throughout much of the site exhibited signs of historical disturbance and churning. Soil samples within the drainage line represented typical alluvial soils.

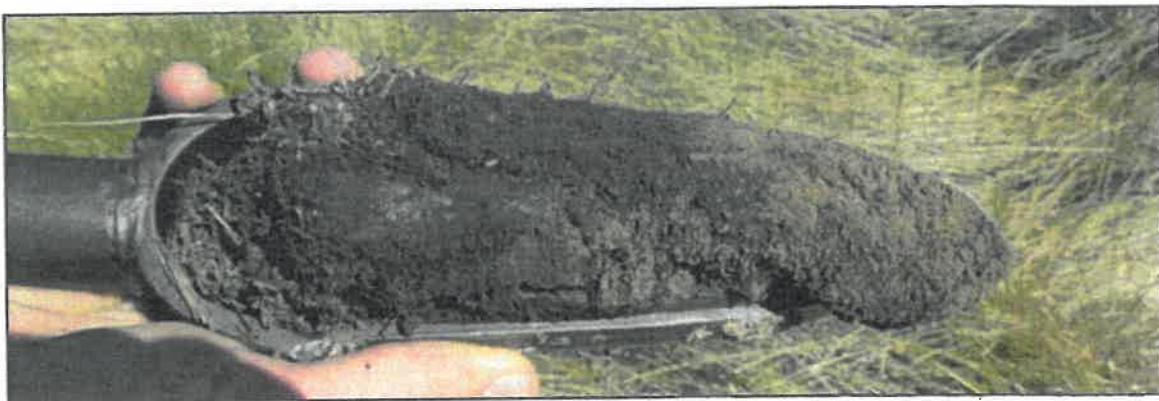


Figure 11: Representative moist wetland soil sample with an extensive organic surface layer.

### 3.2.2 Vegetation

It was found that all watercourses within the property were severely degraded due primarily to the presence of dense forests of *Acacia saligna* and *Eucalyptus spp.* along with dense stands of alien grasses, particularly *Lolium perenne*. Sparse wetland vegetation was encountered on site, however where wetland soils were present, vegetation such as *Chasmanthe aethiopica*, *Juncus acutus*, *Pennisetum macrourum*, *Zantedeschia aethiopica* and *Typha capensis* (refer to Figure 12, Figure 13, and Figure 14), were occasionally present. These species are known to occur in wetlands and the latter four are listed as wetland obligate in either Appendix C of DWAF (2008) or in van Ginkel et. al. (2011).

Riparian zones were substantially eroded and largely devoid of indigenous vegetation along the non-perennial drainage line; however, pockets of indigenous *Sersia glauca* and *laevigata* were encountered.



Figure 12: *Juncus acutus* (left), and *Chasmanthe aethiopica* and *Pennisetum macrourum* (right).



Figure 13: *Typha capensis* within the drainage channel.



Figure 14: Southern portion of the drainage channel, with *Zantedeschia aethiopica*.

### 3.2.3 Freshwater Feature Classification

The study area is situated within the Southwestern Coastal Belt ecoregion, the Berg Water Management Area (WMA), and the Greater Cape Town Sub-WMA as defined by NFEPA (2011). The table below summarise the results from Level 4 through to Level 6 of the wetland and aquatic ecosystem classification user manual (Ollis *et. al.* 2013).

Table 7: Level 4, 5 and 6 of the wetland and aquatic ecosystem classification

<p><b>Level 4</b> (Hydrogeomorphic unit)</p>	<p><b>River:</b> a linear landform with clearly discernible bed and banks, which permanently or periodically carries a concentrated flow of water. A river is taken to include both the active channel and the riparian zone as a unit. <b>Depression:</b> a wetland or aquatic ecosystem with closed (or near-closed) elevation contours, which increases in depth from the perimeter to a</p>
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	central area of greatest depth and within which water typically accumulates.
<b>Level 5 (Hydrological regime)</b>	<b>Non-perennial:</b> does not flow continuously throughout the year, although pools may persist. <b>Seasonally inundated:</b> with surface water present for extended periods during the wet season/s (generally between 3 to 9 months duration) but drying up annually, either to complete dryness or to saturation.
<b>Level 6 (Descriptors)</b>	<b>Natural:</b> existing in, or, produced by nature; not made or caused by humankind.

### 3.3 Watercourse Delineation

A site-based delineation of watercourses was undertaken on 9 November 2018. The method supplied by DWAF (2005, updated 2008) for delineation of wetlands and riparian zones was followed. The presence of hydromorphic and alluvial soil features, hydrophytic vegetation, and soil hydrology within the upper 50cm of the soil were all used in varying combinations as indicators of temporary wetland and riparian boundaries.

Two drainage channels and a mosaic of depression wetlands were delineated on Farm 29 (refer to Figure 16 below). The drainage line indicated by the NGI was found to be largely present and although wetlands were found within the northern parts thereof, it was found largely to be a true ephemeral drainage line dominated by alluvial soils without hydromorphic soil features present. The drainage line was found to have been subjected to substantial erosion related to the presence of invasive species and may in the past have had more substantial riparian zones and may have provided additional water to wetlands near its banks.

The northernmost drainage line indicated in the delineation map below (between the northernmost wetland and the northern boundary) is artificial has been excavated historically such that the fall is northwards and up-slope and was likely installed as a measure to drain the wetlands at the southern extreme of the channel.

A mosaic of depression wetlands were delineated within the southern and north-western portion of the site (refer to Figure 15). Wetlands delineated on Farm 29 were not in line with the WCBSP (2017) ESA 2 wetlands discussed in section 3.1.2, as no wetlands were found within the upper eastern portion of Farm 29.

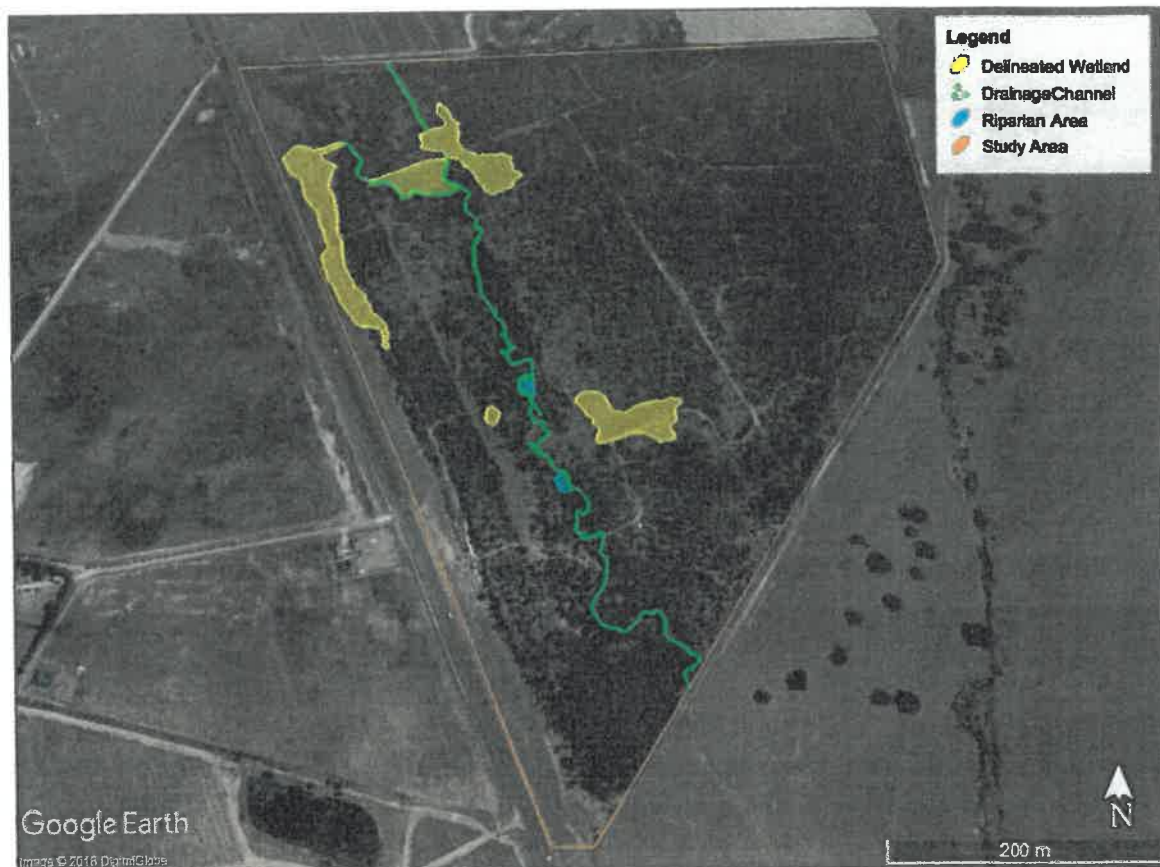


Figure 15: Freshwater feature delineations on Farm 29, Stellenbosch.

### 3.4 Ecosystem Services

The WET-EcoServices tool (Kotze et. al., 2007) was applied to the mosaic of depression wetlands found within Farm 29 in its present, predevelopment state.

Fifteen Ecosystem Services were assessed and the results are presented in Figure 16. Brief explanations of the most noteworthy results are provided below:

- The wetlands are of high importance in terms of the assimilation of phosphates, nitrates and toxicants due largely to the extent to which the larger catchment of the wetland is transformed for agricultural purposes which likely results in a high volume of input of nutrients and toxicants.
- Streamflow regulation and flood attenuation both are moderately significant ecosystem services provided by the wetland. The wetlands absorb water under flood conditions and release it slowly, thereby decreasing flood peak flows within the adjacent drainage lines and increasing the length of time that they flow for.
- The moderately high score for sediment trapping is consistent with both the general function of a depression wetland on a landscape scale. Overtopping of the drainage lines during flood conditions would also result in sediment trapping on a limited scale.
- The moderately high score for erosion control is largely the result of the sediment trapping and streamflow regulation functions filled by the wetland complex.
- The mid-range score for provision of biodiversity is due largely the result of the critically endangered wetland vegetation type, and the potential provision of rare habitat should the

wetlands be rehabilitated, and not to the range or importance of biodiversity currently present within the site.

- There is no legitimate human use of these wetlands at present beyond dumping, so Education and Research, Tourism, Recreation and Scenic Value, Cultural Significance, Provision of Cultivated Foods, Harvestable Natural Resources and Water Supply for Direct Human Use all scored zero or near zero.

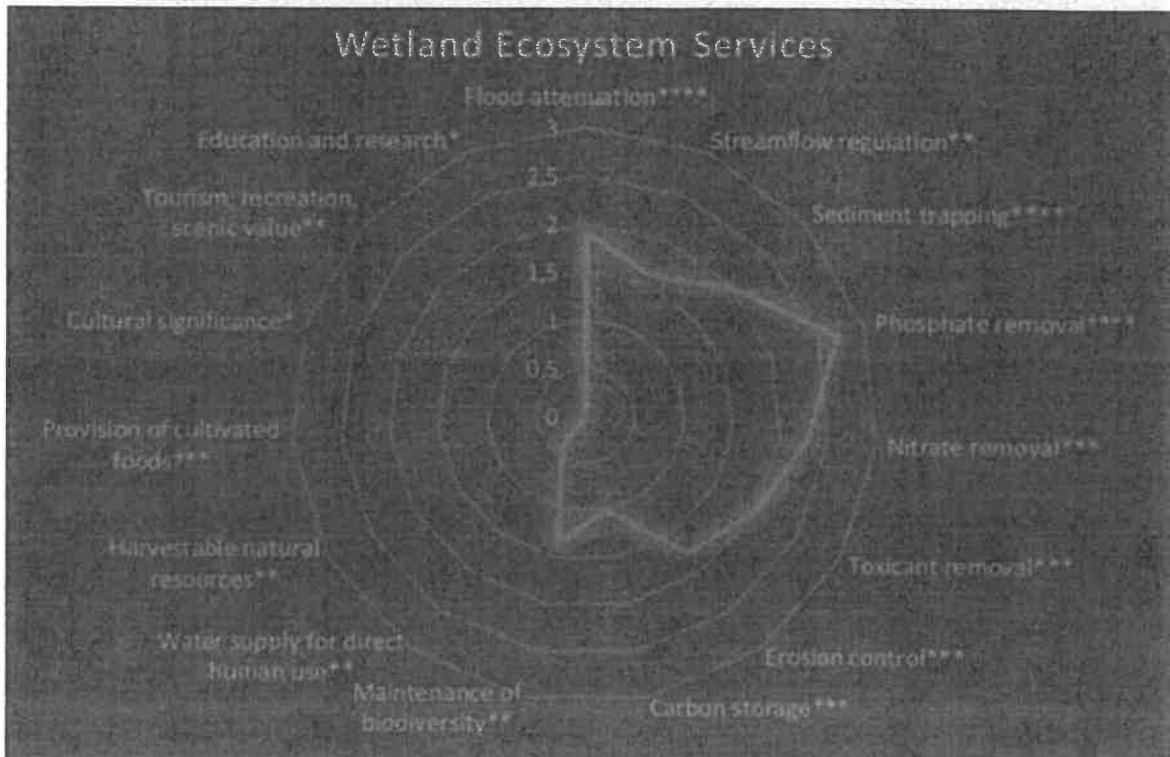


Figure 16: Spider diagram indicating the range of ecosystem services provided by the wetlands.

Table 8: Classes for determining the likely extent to which a benefit is being supplied based on the overall score for that benefit (after Kotze et al., 2007).

Score (range 0 – 4)	<0.5	0.5-1.2	1.3-2.0	2.1-2.8	>2.8
Rating of the likely extent to which a benefit is being supplied	Low	Moderately Low	Intermediate	Moderately High	High

Table 9: WET-EcoServices results table for the mosaic of depression wetlands indicating scores pre-development.

Wetland Ecosystem Services	
Indirect Benefits (regulating and supporting benefits)	
Flood attenuation****	1.9
Streamflow regulation**	1.6
Sediment trapping****	2
Phosphate removal****	1.5
Nitrate removal***	1.5
Toxicant removal**	2

Erosion control***	1,8
Carbon storage***	1
<b>Direct Benefits</b>	
Maintenance of biodiversity**	1,4
Water supply for direct human use**	0,4
Harvestable natural resources**	0
Provision of cultivated foods***	0
Cultural significance*	0
Tourism, recreation, scenic value**	0
Education and research*	0

### 3.5 Present Ecological State

#### 3.5.1 Non-perennial Drainage Line

In order to determine the PES of the non-perennial drainage lines, the river IHIA was applied. The IHIA is founded on the assessment of two separate modules of a watercourse namely riparian habitat and instream habitat.

The key reasoning behind the river IHIA results are summarised below:

- Water abstraction:
  - The area is heavily invaded by alien vegetation in the riparian zone and catchment, which would result in significantly increased evapotranspiration rates.
- Flow modification:
  - The transformation of the broader catchment for agricultural purposes would likely result in a modification in flow;
  - Stacks of dead alien invasive vegetation, namely woody *Acacia saligna* branches, were encountered throughout the channel thereby affecting the flow.
- Channel and bed modification:
  - The drainage line channels have become severely eroded as the *Acacia saligna* and *Eucalyptus* forest and alien annual grasses have resulted in an almost complete loss of indigenous catchment and streamside vegetation which would ordinarily have stabilised the bed and banks. The reduced surface roughness within the catchment has also likely resulted in increased storm peak flows which further exacerbates erosion.
  - Roads have been constructed and reinforced over or near the channels;
  - The drainage line beds have further been modified by application of dense stacks of dead *Acacia saligna* branches.
- Water quality modification:
  - Runoff from surrounding agricultural activities in the broader catchment would likely result in impaired water quality.
- Inundation:



- Previously cleared alien vegetation has been brush piled within some parts of the drainage channels and may have caused minor inundation over short periods of time.
- Exotic Macrophytes and Fauna:
  - The riparian zone, instream area, and surrounding farm is severely invaded by alien vegetation.
  - No exotic fauna was noted.
- Solid waste disposal:
  - Dumping was noted in portions of riparian and instream areas.
- Indigenous vegetation removal:
  - Severe encroachment of alien invasive vegetation and a lack of indigenous vegetation was evident. Indigenous vegetation would likely have been removed during the construction of access roads.
- Bank erosion:
  - Significant erosion of the channel was observed.

The overall habitat integrity score for the drainage channel was 40.7, which falls within a low IHIA Category D: Largely modified. A large loss of natural habitat, biota and basic ecosystem functions has occurred.

**Table 10: Descriptive classes for the assessments of modifications to the habitat integrity (after IHIA, 1999).**

IMPACT CATEGORY	DESCRIPTION	SCORE
None	No discernible impact, or the modification is located in such a way that it has no impact on habitat quality, diversity, size and variability.	0
Small	The modification is limited to very few localities and the impact on habitat quality, diversity, size and variability is also very small.	1-5
Moderate	The modifications are present at a small number of localities and the impact on habitat quality, diversity, size and variability is also limited.	6 - 10
Large	The modification is generally present with a clearly detrimental impact on habitat quality, diversity, size and variability. Large areas are, however, not influenced.	11 - 15
Serious	The modification is frequently present and the habitat quality, diversity, size and variability in almost the whole of the defined area is affected. Only small areas are not influenced.	16 - 20
Critical	The modification is present overall with a high intensity. The habitat quality, diversity, size and variability in almost the whole of the defined section is influenced detrimentally.	21 - 25

**Table 11: Results of the IHI assessment for the non-perennial drainage channel.**

	Impact score, Pre-development	Weight	IHI Score, Pre-development
<b>Instream criteria</b>			
Water abstraction	18	14	10,08
Flow modification	18	13	9,36
Bed modification	16	13	8,32

Channel modification	18	13	9,36
Water quality	8	14	4,48
Inundation	1	10	0,4
Exotic macrophytes	15	9	5,4
Exotic fauna	0	8	0
Solid waste disposal	8	6	1,92
<b>Provisional Instream Habitat Integrity</b>			<b>50,66</b>
<b>Riparian zone criteria</b>			
Indigenous vegetation removal	20	13	10,4
Exotic vegetation encroachment	25	12	12
Bank erosion	18	14	10,08
Channel modification	20	12	9,6
Water abstraction	24	13	12,48
Inundation	0	11	0
Flow modification	22	12	10,56
Water quality	8	13	4,16
<b>Provisional Riparian Zone Habitat Integrity</b>			<b>30,72</b>
<b>Overall Habitat Integrity</b>			<b>40,7</b>
PES Category			D

### 3.5.2 Depression Wetlands

WET-Health is a measure of the degree of departure of a wetland from a natural or reference condition. This method assesses hydrological, geomorphological and vegetation health in three separate modules. The probable trajectory of change is also considered. A level 1 WET-Health tool was applied to the depression wetland mosaic in its present, pre-development state.

The key reasoning behind the WET-Health assessments is summarised below:

- The dense, mature forest of alien invasive *Acacia saligna* and various *Eucalyptus* species in and around the wetlands has resulted in almost complete loss of wetland vegetation and has severely impacted wetland hydrology.
- Construction of a drainage channel in the north of the property has severely impacted wetland hydrology in this area.
- Erosion of the natural drainage lines as a result of natural vegetation loss and a reduction in surface roughness in and around the channels has caused the channels to become more efficient in transporting runoff away from the wetlands and has reduced the likelihood and frequency of overtopping into the wetlands, thereby further altering hydrology.
- Geomorphological changes in the form of informal roads and storm water drainage systems has likely resulted in some degradation and transformation of the catchment, however the impact is likely to be minimal. The high soil disturbance and frequent wildfires would likely have an impact on geomorphology overall.
- Runoff from surrounding agricultural activities in the broader catchment would likely result in impaired water quality as it would likely carry phosphates and nitrates from fertilizer, toxicants from herbicide and insecticide and would likely carry significant sediment volumes.

The findings of the assessment are as follows:

**Table 12: WET-Health results table for the wetlands.**

	Hydrology	Geomorphology	Vegetation
Impact category – without development	E	C	F
Ecological trajectory – without development	↓	↓↓	↓↓

→ State is likely to remain stable over the next 5 years.

↓ State is likely to deteriorate slightly over the next 5 years.

↓↓ State is expected to deteriorate substantially over the next 5 years.

The overall wetland health scores<sup>4</sup> calculated for the mosaic of depression wetlands is 7.1 a Category E – The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable.

### 3.6 Ecological Importance and Sensitivity

The EIS method applied to wetlands is based on the assessment tool developed by Rountree et. al. (2014). The assessment was conducted for the mosaic of depression wetlands in its present, predevelopment state.

The key aspects considered during this EIS assessment are summarised below and in the table to follow:

- It is likely, given the Critically Endangered conservation status of the West Coast Shale Renosterveld vegetation type applicable to the wetlands, that species presently considered to be of conservation concern once inhabited these wetlands. None were identified and most have likely been lost due to the degraded nature of the wetlands, but some may remain within the seed bank.
- The wetlands are not formally protected, however, the West Coast Shale Renosterveld wetland vegetation group is critically endangered within the region and parts of the site have been recognised as important within the WCBSP.
- The wetlands calculated an overall PES score with classification of “Largely modified” therefore scored lower for ecological integrity.
- The wetlands have a low diversity of habitat types within the portions assessed, being largely limited to seasonal and temporary zone depression wetland.

A score of one determined is a “Low/marginal” EIS (Wetlands that are not ecologically important and sensitive at any scale. The biodiversity of these systems is ubiquitous and not sensitive to flow and habitat modifications. They play an insignificant role in moderating the quantity and quality of water of major rivers.).

**Table 13: Results of the EIS Assessment for the wetlands**

ECOLOGICAL IMPORTANCE AND SENSITIVITY	Score (0-4)	Confidence (1-5)
<b>Biodiversity support</b>		
Presence of Red Data species: Endangered or rare Red Data species present	1	2

<sup>4</sup>(hydrology score) x 3 + (geomorphology score) x 2 + (vegetation score) x 2 / 7 = overall wetland health

Populations of unique species: Uncommonly large populations of wetland species	0	4
Migration/breeding/feeding sites: Importance of the unit for migration, breeding site and/or feeding	1	2
<b>Landscape scale</b>		
Protection status of the wetland: National (4), Provincial, private (3), municipal (1 or 2), public area (0-1)	1	5
Protection status of the vegetation type: SANBI guidance on the protection status of the surrounding vegetation	4	5
Regional context of the ecological integrity: Assessment of the PES (habitat integrity), especially in light of regional utilisation	1	3
Size and rarity of the wetland type/s present: Identification and rarity assessment of the wetland types	2	3
Diversity of habitat types: Assessment of the variety of wetland types present within a site	1	2
<b>Sensitivity of the wetland</b>		
Sensitivity to changes in floods: Floodplains at 4; valley bottoms 2 or 3; pans and seeps 0 or 1	1	3
Sensitivity to changes in low flows/dry season: Unchannelled VB's probably most sensitive	3	3
Sensitivity to changes in water quality: Esp natural low nutrient waters – lower nutrients likely to be more sensitive	2	2
<b>ECOLOGICAL IMPORTANCE AND SENSITIVITY</b>	<b>1</b>	<b>3</b>

Table 14: Description of EIS Results

EIS Category definitions	Range of EIS score
<b>Very high:</b> Wetlands that are considered ecologically important and sensitive on a national or even international level. The biodiversity of these systems is usually very sensitive to flow and habitat modifications. They play a major role in moderating the quantity and quality of water of major rivers	>3 and <=4
<b>High:</b> Wetlands that are considered to be ecologically important and sensitive. The biodiversity of these systems may be sensitive to flow and habitat modifications. They play a role in moderating the quantity and quality of water of major rivers.	>2 and <=3
<b>Moderate:</b> Wetlands that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these systems is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.	>1 and <=2
<b>Low/marginal:</b> Wetlands that are not ecologically important and sensitive at any scale. The biodiversity of these systems is ubiquitous and not sensitive to flow and habitat modifications. They play an insignificant role in moderating the quantity and quality of water of major rivers.	>0 and <=1

### 3.7 Recommended Ecological Category

The mosaic of depression wetlands were found to fall within a PES Category E; (refer to section 3.5), and is considered to a "Low/marginal" EIS. A low IHIA Category D: Largely modified, was found for the drainage channel.

The REC for the wetlands would therefore be an increase in category to C and this would be achievable through extensive alien clearing alone, with additional gains that could be made through infilling of the artificial drainage channel in the north, combatting erosion within the drainage channels and undertaking active rehabilitation of the wetlands through planting and seeding.

### 3.8 Buffer Determination

Application of the best practice method for determination of the minimum effective buffer for the drainage line and wetland mosaic, found that a buffer of 15m was appropriate (refer to Figure 17).

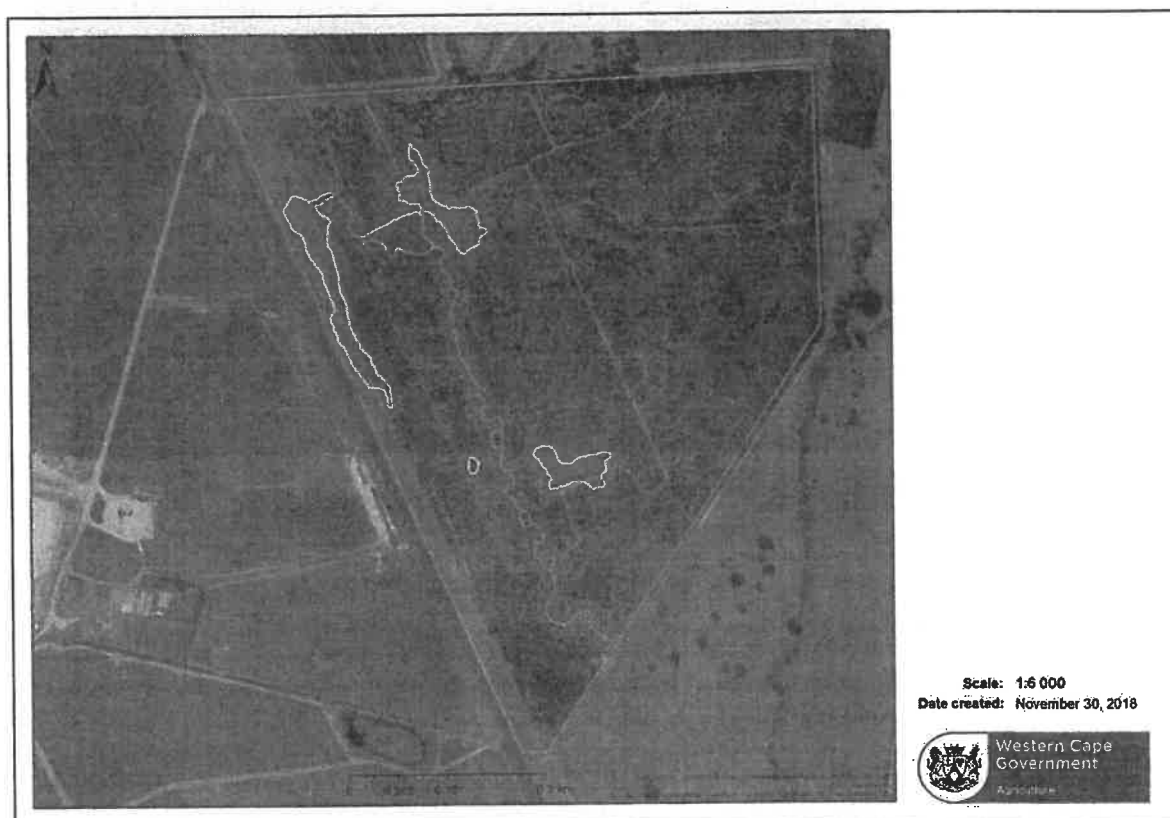


Figure 17: Minimum effective buffer of 15m applied to assessed freshwater features.

## 4 Assessment of Impacts

### 4.1 Activity Description

Development of the proposed memorial park would involve construction of extensive hard infrastructure, installation of limited sewage infrastructure, graves and landscaping of an extensive parkland including planting of indigenous trees and fynbos, watering and use of fertiliser and possibly herbicides. The area earmarked for installation of graves coincides partially with wetlands A and D. The remainder of wetlands A and D, along with wetlands B and C and both drainage lines fall within the area earmark for parkland or forest area and can therefore be accommodated. Wetland B is adjacent to the proposed nursery. Refer to Figure 18.

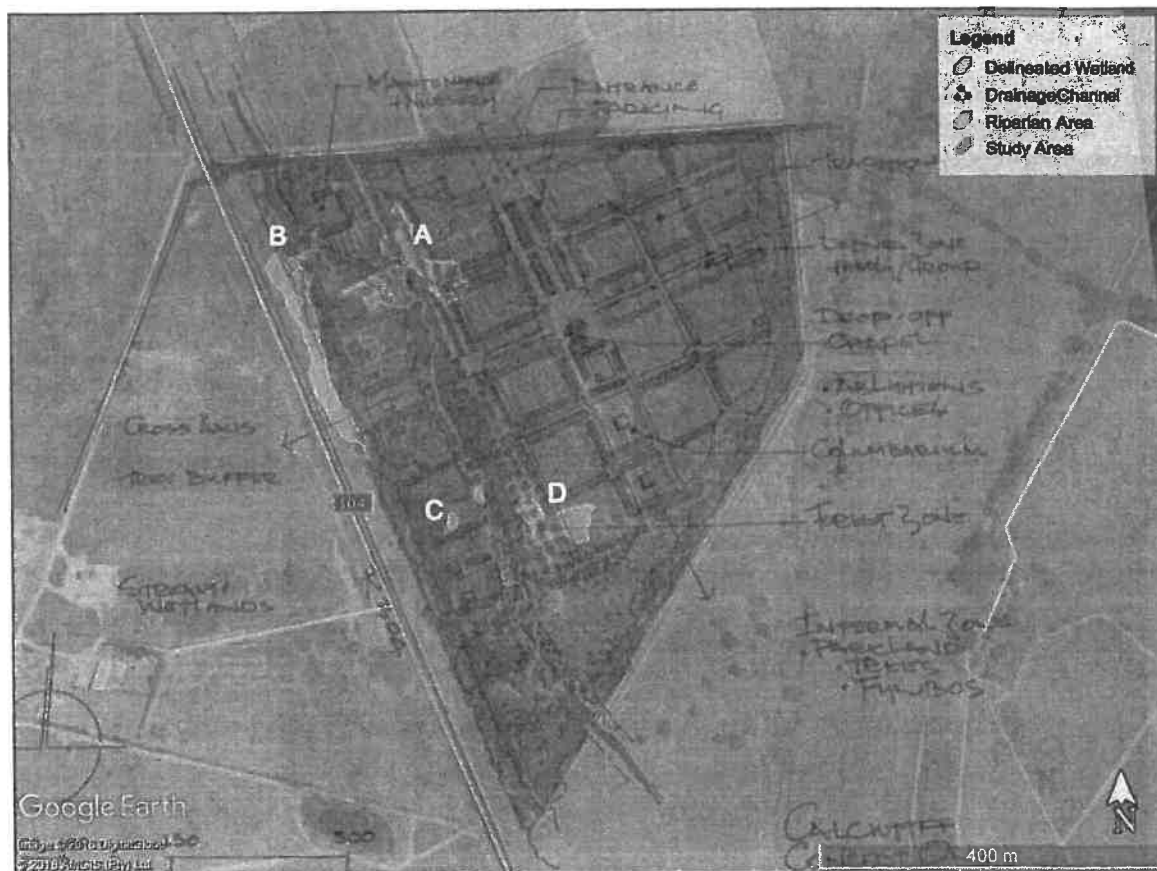


Figure 18: Overlay of the delineated freshwater features on the proposed development layout plan.

## 4.2 Direct Impacts

Authorisation of the following water use<sup>5</sup> will be required for the proposed development:

- (c) impeding or diverting flow within a watercourse.
- (i) altering the bed, banks, course or characteristics of a watercourse.

It is a requirement of the WUL application process that potential impact on the following characteristics be determined:

- Impact on the flow regime;
- Impact on the water quality;
- Impact on biota – the animal and plant life of a particular region or habitat;
- Impact on wetland and riparian habitat.

These four potential direct impacts therefore formed the foundation of the impact assessment and no additional potential impacts were identified.

<sup>5</sup> As listed within Section 21 of the NWA.

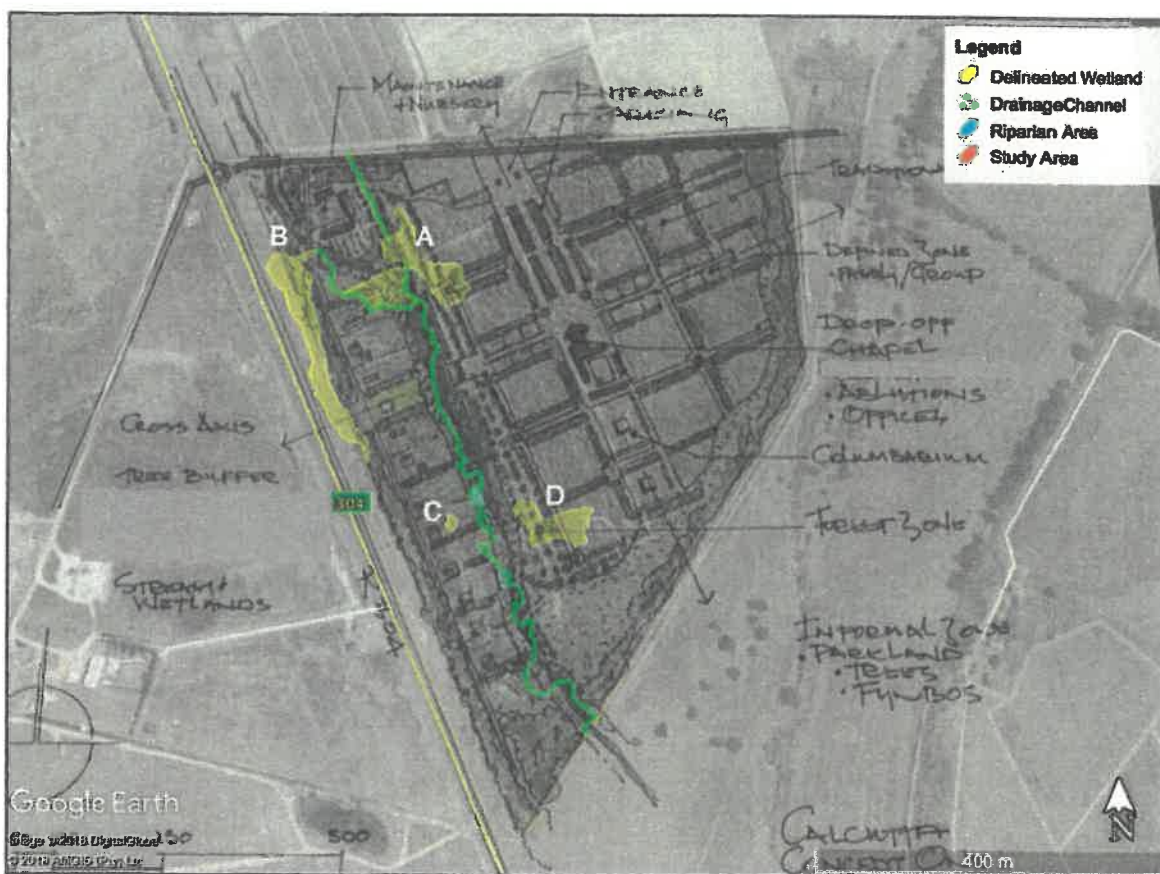


Figure 18: Overlay of the delineated freshwater features on the proposed development layout plan.

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<sup>5</sup> As listed within Section 21 of the NWA.





## 4.2.1 Impact 1 – Impact on the flow regime

### 4.2.1.1 Construction Phase

Construction of the proposed development would most likely result in an increase in runoff from areas that have been cleared. This would likely also result in an increase in storm peak flows and velocities, with a greater impact on the southern reaches of the drainage line, and wetlands C and D. Portions of wetlands A and D would be infilled, resulting in a loss of function within these wetlands, and further shifts in the flow regime within the drainage line. Furthermore, as a result of soil compaction and a reduction in surface roughness, an increase in erosion and sedimentation of the drainage line would likely occur.

#### Essential Mitigation Measures

- 

### 4.2.1.2 Operational Phase

The proposed development involves the presence of hardened infrastructure over, as well as around the delineated wetlands; wetlands most impacted upon are wetlands A and D. This would likely increase runoff within the affected catchment and storm peak flows within watercourses and drainage channels. This would likely change the overall hydrology within the catchment area primarily affecting wetlands A and D which are east of the drainage lines.

Watering of the landscaped area would augment the current water volumes during the summertime dry period which may cause a shift in wetland zonation and seasonality, depending on the scale. This impact may be reduced considerably through mitigation.

The increase in surface roughness throughout the surrounding parkland area, but particularly in the less formal areas where denser fynbos shrublands are established would serve as inherent mitigation against increased runoff from the other factors discussed above.

#### Essential Mitigation Measures

The following mitigation measures are considered essential:

- Wherever possible, establish a 15m buffer around each wetland and the drainage channel within which vegetation indigenous to the applicable vegetation type is planted;
- Harvest rainwater from the entire area of the roofs of all buildings for use in irrigation;
- Plant vegetation indigenous to the applicable terrestrial vegetation type at a density of at least 4 per m<sup>2</sup> in any buffer zones established. The buffer zones may be incorporated into the proposed parkland.

### 4.2.1.3 Results

Impact 1: Impact on the Flow Regime						
	Intensity	Extent	Duration	Probability of impact occurring	Significance	
<b>Construction Phase</b>						
Proposed Layout: Without mitigation	Medium	Local	Short term	High	Medium (-ve)	
Proposed Layout: With mitigation	Low	Local	Short term	High	Very Low (-ve)	
<b>Operational Phase</b>						
Proposed Layout: Without mitigation	Medium	Local	Long term	High	Low (-ve)	
Proposed Layout: With mitigation	Very Low	Local	Long term	High	Very Low (-ve)	

## 4.2.2 Impact 2 – Impact on Water Quality

### 4.2.2.1 Construction Phase

Construction of brick and mortar and other hard infrastructure involves the use of various chemicals including cement, sulphuric acid, paint, paint thinners and petrochemicals associated with construction vehicles all of which may spill and be carried by runoff into the wetlands downslope thereby impacting water quality. Site clearing and preparation may also leave large areas of exposed sand available for erosion which may significantly increase the sediment load in the runoff entering the wetlands downslope. Compost and fertiliser used in landscaping of the parkland area and elsewhere may increase the nutrient load in runoff potentially leading to eutrophication of the wetlands (if in high volume) and herbicide used in alien clearing of the site may also impact runoff quality significantly.

#### Essential Mitigation Measures

- Ensure that all construction chemicals are mixed and poured within the construction footprint on a bunded surface designated for this purpose by an Environmental Control Officer (ECO).
- Ensure that all construction vehicles remain within the construction footprint and are parked and serviced on a bunded surface designated for this purpose by an ECO or at an appropriate location offsite.
- Place compost and fertilizer within the holes dug for planting when landscaping.
- Use herbicide only for direct stump treatment of acacias and other woody alien invasive species. Control invasive annuals by hand-pulling.
- Conduct site clearing in summer to reduce the likelihood of erosion of exposed sediments and allow for maximum construction before winter.
- Install sediment fences at the boundary of all cleared areas to sediment.

### 4.2.2.2 Operational Phase

Routine use of compost and fertilizer in the more formal landscaped areas and the presence of laterite roads and pathways (if used) would result in increased nutrient load (particularly phosphates and nitrates) in runoff. Laterite roads and pathways would also increase the nutrient load in runoff. The presence of graves may increase the nutrient load within groundwater that likely enters the depression wetlands. Herbicides used for continued control of alien invasive species and may enter the wetlands via runoff. Runoff from roads and parking lots will likely contain limited volumes of oil and petrochemicals. Erosion from graves and unmade or laterite roads and pathways would add to the sediment load within runoff. Concrete leaches hydroxyl ions which would raise the pH of runoff and groundwater and may therefore increase the pH of soil and water within adjacent wetlands. There is however little concrete construction planned that is adjacent to the wetlands.

#### Essential Mitigation Measures

- Ensure that all fertilizer, compost, herbicides and pesticides are stored on a bunded surface that drains to a sump and not into a watercourse.
- Ensure that all plants within the nursery area are grown on a bunded surface.
- Dig fertilizer and compost into the soil whenever used to minimised nutrient load in runoff.
- Confine all vehicles to roads and parking lots.
- Do not use laterite in the construction of roads and pathways.
- Use herbicide only for direct stump treatment of acacias and other woody alien invasive species. Control invasive annuals by hand-pulling.

### 4.2.2.3 Results

Impact 2: Impact on Water Quality					
Alternatives	Intensity	Extent	Duration	Probability of impact occurring	Significance
<b>Construction Phase</b>					
Proposed Layout: Without mitigation	Low	Local	Short Term	High	Medium (-ve)

Proposed Layout: With mitigation	Low	Local	Short term	Medium	Low (-ve)
<b>Operational Phase</b>					
Proposed Layout: Without mitigation	Medium	Local	Long term	High	Low (-ve)
Proposed Layout: With mitigation	Low	Local	Long term	Medium	Low (-ve)

### 4.2.3 Impact 3 – Wetland Habitat

#### 4.2.3.1 Construction Phase

The impact on wetland habitat is large given the proposed development plan. The proposed development would result in a complete loss of habitat and function within portions of wetlands A and D. The majority of wetland habitat has however been lost and function has been severely impacted through alien invasion, but wetland habitat would likely recover to a large degree after removal of the alien invasive species.

Additional impacts would be in the form of wind-blown litter from the construction site that may smother plants and entangle or be ingested by wildlife.

#### *Essential Mitigation Measures*

- Implement an effective alien invasive vegetation removal programme throughout the proposed site.
- Allow two years after initial alien clearing for the seed bank to germinate and then draft and implement a rehabilitation plan, primarily including planting and seeding. This must be undertaken by a SACNASP registered freshwater or botanical specialist.
- A minimum buffer of 15m should be established around each wetland and the drainage channel within which vegetation indigenous to the applicable vegetation type is planted.

Windblown litter can be mitigated against by implementing the following:

- Ensure that all contractors are aware of a 'no-littering' policy while on the construction site.
- Inspect the proposed development site weekly and remove all litter.
- Inspect wetlands within the property monthly and remove all litter.

#### 4.2.3.2 Operational Phase

The impact of changes in water quality and hydrology on wetland habitat would be largely similar in the operational phase to that of the construction phase assessed above. The only significant exception would be the large number of graves present within proposed development area, but these are likely to be hydrologically divorced from the wetlands due to their depth and are therefore unlikely to impact wetland or drainage line water quality. Windblown litter may also be a concern in the operational phase given the public nature of the memorial park.

#### *Essential Mitigation*

- Use herbicide only for direct stump treatment of acacias and other woody alien invasive species. Control invasive annuals by hand-pulling.
- Implement a "no bins" policy within the proposed site and do not provide bins.
- Ensure that all visitors are aware of a "no-littering" and "no bins" policy while within the memorial park by erecting signage at all entrances.
- Inspect the memorial park weekly and remove all litter.
- Inspect wetlands within the property monthly and remove all litter.

#### 4.2.3.3 Results

**Impact 3: Impact on Wetland Habitat**

Alternatives	Intensity	Extent	Duration	Probability of impact occurring	Significance
<b>Construction Phase</b>					
Proposed Layout: Without mitigation	Medium	Local	Permanent	Definite	High (-ve)
Proposed Layout: With mitigation	Low	Local	Short term	Medium	Low (+ve)
<b>Operational Phase</b>					
Proposed Layout: Without mitigation	Medium	Local	Long term	Medium	High (-ve)
Proposed Layout: With mitigation	Low	Local	Long term	Medium	Low (+ve)

## 4.2.4 Impact 4 – Impact on Biota

### 4.2.4.1 Construction Phase

The construction phase would likely result in a complete loss of wetland biota within the infilled portions of wetlands A and D. Plants, invertebrates and amphibians would be the most affected. Open pits in construction areas adjacent to wetlands may lead to substantial amphibian deaths, particularly in winter. Rehabilitation within open areas on site would likely have a positive impact on all wetland biota.

The only other possible impact would be in the form of illegal harvesting, trapping and hunting often associated with natural areas adjacent to construction site. The risk of this impact occurring increases with proximity to the construction area. No huntable wetland fauna was noted however during the site visit and the rarity or absence of wetland fauna would further reduce the likelihood of this impact occurring.

#### Essential Mitigation Measures

- Clearly demarcate the boundary of all wetland areas and buffer zones and ensure that all contractors remain out of these areas, except where activities are to be undertaken in terms of the Environmental and Water Use Authorisations.
- It is recommended that digging and filling foundations of buildings be done during summer as far as possible, and that all pits and trenches are covered during winter to limit the potential amphibian deaths.
- Ensure that all contractors are informed that no harvesting of plants, trapping or hunting of wildlife is allowed within the wetland areas, and establish an appropriate fine for the contracting company should any employees be found engaging in these activities.

### 4.2.4.2 Operational Phase

The potential impact on biota during the operational phase would be limited to the secondary impact of changes in water quality and habitat. Both are likely to improve over the current situation, with the exception of the potential increase in pH, the likely impact of which is limited however, as no pH sensitive species were encountered on site and the degree of transformation of the site makes their presence unlikely. Return of such species is likely after rehabilitation of the site. Applicable mitigation is limited to those measures already included under Water Quality and Habitat above.

### 4.2.4.3 Results

Impact 4: Impact on Biota					
Alternatives	Intensity	Extent	Duration	Probability of impact occurring	Significance
<b>Construction Phase</b>					
Proposed Layout: Without mitigation	Low	Local	Long term	High	Low (-ve)
Proposed Layout: With mitigation	Very Low	Local	Short term	Medium	Very Low (+ve)
<b>Operational Phase</b>					
Proposed Layout: Without mitigation	Very Low	Local	Long term	Medium	Very Low (-ve)
Proposed Layout: With mitigation	Very Low	Local	Long term	Medium	Very Low (+ve)

### 4.3 'No Go' Scenario

The 'No Go' scenario would likely result in further degradation of the drainage channel and the mosaic of wetlands, due to the maturing of alien vegetation and soil erosion. It is the municipality's responsibility to clear alien invasive vegetation on municipal land, which would have a long-term positive impact. However, given that an alien eradication plan has not been implemented within the proposed site to date, and that municipal resources are not likely to improve in the foreseeable future, it is in the opinion of the specialist, unlikely that this will happen in the long-term.

	Intensity	Extent	Duration	Probability of impact occurring	Significance
'No Go Scenario'	Low	Local	Permanent	High	Low (-ve)

### 4.4 Indirect Impacts

No indirect impacts were identified.

### 4.5 Cumulative Impacts

No cumulative impacts were identified.

## 5 Conclusion and Recommendation

Freshwater features within Farm 29 were identified and delineated. A mosaic of depression wetlands and two non-perennial drainage lines were identified. Given the high degree of transformation within the farm however, it is possible that the wetland boundaries determined may change after the alien invasive forests have been removed and hydrology has returned to more natural conditions. It is therefore proposed that it be made a condition of any approval granted based on the findings of this report that the site be revisited for verification of the wetland delineation during the wet season (Jul/August) after site clearing is completed, so that reports can be updated and plans adjusted to accommodate post clearing wetland boundaries.

The non-perennial drainage line and the depression wetlands identified were evaluated by best practice methods to determine current EIS, PES and ecosystem services. The drainage line fell within the IHIA Category D, while the depression wetlands had an overall PES score of Category E. Given the disturbed nature of the site, an REC category of C is recommended for all of the freshwater features. Application of the best practice method for determination of an appropriate minimum buffer found that a buffer of 15m would be appropriate for the freshwater features delineated on site.

An impact assessment was conducted, and it was found that, after mitigation, all impact ratings were in the Low or Very Low category, with as many positive ratings as negative. It is therefore the opinion of the specialist that the negative impacts are approximately balanced by the positive impacts. It is therefore recommended that Environmental and Water Use Authorisations be granted for this project. Implementation of the essential mitigation measures would furthermore ensure that the ecological state of all wetlands and drainage lines with the exception of the portions of wetlands A and D that would be infilled, would improve to fall within a PES Category C.

If however the proposed layout were to be adjusted to avoid infilling of wetlands A and D, along with a 15m buffer for each, then the project would represent a significant net positive impact over present conditions.

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## Appendix 1 – Impact Assessment Criteria

The criteria used to determine impact consequence are presented in the tables below.

**Table 1: Description of criteria considered when assessing potential impacts.**

CRITERIA	DESCRIPTION OF ELEMENTS THAT ARE CENTRAL TO EACH ISSUE	
Extent or spatial influence of the impact	SITE SPECIFIC	Site specific/Local: Extends only as far as the activity
	LOCAL	Limited to the site and its immediate surroundings
	REGIONAL	Regional/Provincial: Will have an impact on the region/province
Duration of impact	SHORT TERM	Construction phase
	MEDIUM TERM	Operational phase
	LONG TERM	Where the impact will cease after the operational or working life of the activity, either due to natural processes or by human intervention
	PERMANENT	Where mitigation or moderation by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient or temporary
Intensity of impact	VERY LOW INTENSITY	Natural, cultural and social functions and processes are not affected
	LOW INTENSITY	Affects the environment in such a way that natural, cultural and social functions and processes continue, although in a slightly modified way
	MEDIUM INTENSITY	Affects the environment in such a way that natural, cultural and social functions and processes continue, although in a modified way
	HIGH INTENSITY	Natural, cultural or social functions or processes are altered to the extent that they will temporarily or permanently cease
Probability of impact occurring	LOW	Improbable
	MEDIUM	Probable
	HIGH	Highly probable
	DEFINITE	Impact will occur regardless of any prevention methods
Determination of significance	LOW	The impacts will have a minor or insignificant influence on the watercourse.
	MEDIUM	The impacts will have a moderate influence on the watercourse. The impact can be ameliorated (lessened or improved) by a modification in the project design or implementation of effective mitigation measures.
	HIGH	The impacts will have a high influence on the watercourse. The impact can be ameliorated (lessened or improved) by a modification in the project design or implementation of effective mitigation measures. Should have an influence on decision, unless it is mitigated
	VERY HIGH	The impacts will have a major influence on the watercourse. The impacts could have the no-go implications on portions of the development regardless of any mitigation measures that could be implemented. Influence decision, regardless of any possible mitigation.

SIGNIFICANCE RATING	LIST OF CRITERIA USED IN ASSIGNING A SPECIFIC SIGNIFICANCE RATING		
	INTENSITY	EXTENT	DURATION
Very High	High	National	Permanent / Long Term
	High	Regional	Permanent / Long Term
	Medium	National / Regional	Permanent
High Significance	High	Regional	Medium Term
	High	National	Short Term



SIGNIFICANCE RATING	LIST OF CRITERIA USED IN ASSIGNING A SPECIFIC SIGNIFICANCE RATING		
	INTENSITY	EXTENT	DURATION
	High	Local	Long Term / Permanent
	Medium	National	Medium Term
	Medium	Regional	Long Term
Medium Significance	High	Local	Medium Term
	Medium	Local	Permanent
	High	Regional	Short Term
	Medium	National	Short Term
	Medium	Regional	Medium Term
	Medium	Local	Long Term / Permanent
	Low	National	Medium Term
	Low	Regional	Long Term
Low Significance	High	Local	Short term
	Medium	Local	Short Term / Medium Term
	Medium	Regional	Short Term
	Low	National	Short Term
	Low	Regional	Medium Term
	Low	Local / Site specific	Long Term
	Low	Local	Permanent
Very Low Significance	Very Low	Local	Long Term / Permanent
	Low	Local	Short term
	Low	Site specific	Medium / Short Term
	Very low	Site specific / Local	Short Term



## BOTANICAL STATEMENT

### CALCUTTA MEMORIAL PARK, STELLENBOSCH

PROPOSED ESTABLISHMENT OF A MEMORIAL PARK ON THE REMAINDER OF FARM CALCUTTA  
NO. 29, STELLENBOSCH LOCAL MUNICIPALITY, WESTERN CAPE PROVINCE.



**30 January 2019**

**PJJ Botes (Pri. Sci. Nat.)**

©

## **SUMMARY - MAIN CONCLUSIONS**

Stellenbosch Municipality is in urgent need to establishing additional communal cemeteries to service the larger Stellenbosch Municipal area. Various sites were evaluated, of which the Farm Calcutta No. 29 was identified (after preliminary discussions with CapeNature) as a potential suitable site.

According to the 2012 (beta 2) version of the Vegetation map of SA (Mucina & Rutherford, 2006) the site is located within an area that historically would have been covered by Swartland Shale Renosterveld (Figure 2), a critically endangered vegetation type in terms of "List of ecosystems that are threatened and in need of protection" (GN 1002, December 2011). However, land use and other spatial data indicated that the site is likely to be degraded and planted to woodlots. The site visit confirmed that the property is basically transformed as a result of alien infestation and other historical practices.

According to the Stellenbosch spatial dataset of the WCBSP (Figure 3), Calcutta overlaps a proposed critical biodiversity area (Class 2) to the west of the small stream, an ecological support area (Class 2) associated with the small stream crossing the property and a terrestrial ecological support area (Class 2) associated with the area to the east of the small stream. In this case the ecological support areas associated with the small seasonal stream is potentially the only feature of significance remaining. Both the CBA to the west and the ESA to the east of this little stream has been degraded to the point of being transformed. Connectivity is also mostly compromised, but with sensible planning the Calcutta site may still play a role as an potential ecological corridor (even though it is highly unlikely to ever be able to revert this area back to natural or near natural).

According to the 2013-2014 National land cover dataset, the property is covered by mature plantations or woodlots to the east of the small stream, while the areas west of the stream is likely to still be covered in shrubland fynbos. The site visit confirms that the area to the east of the small stream is covered by dense alien invasive species (consistent with the National Land cover map), but the area to the east of the stream is has been degraded to an open grassland with no more shrubland or fynbos elements remaining (Refer to Picture 1 & 2).

The site visit confirmed that the Calcutta property is overgrown by a dense mix of alien invasive plant (AIP) species, dominated by *Eucalyptus* species and Port Jackson (*Acacia saligna*). No natural vegetation was encountered, apart from a few hardy remaining shrubs and sedges, which was mostly associated with the small seasonal stream. Apart from the dense stand of invasive species the site also showed a multitude of other disturbances, including sand mining activities, dumping and harvesting of fire wood (*Eucalyptus*) as well as individuals cutting fence poles.

Botanically speaking, the site is clearly degraded to the point of being transformed. Very few indigenous plant species remains on site (covering less than 5% of the area) and they were all hardy shrubs or pioneer species. It is considered unlikely that the natural veld will ever be able to re-establish itself on the site. The small seasonal stream is similarly degraded, with almost no riparian vegetation remaining. Ideally one should try to rehabilitate this stream and re-establish natural riparian vegetation. However, this will not happen under the current land use, but it is possible to make the stream a feature of the memorial park and to rehabilitate it to a more natural state.

Based on the current status of the site, it is considered unlikely that the proposed development will have any significant impact on indigenous vegetation or even national or provincial conservation targets.

### **INDEPENDENCE & CONDITIONS**

PB Consult is an independent consultant and has no interest in the activity other than fair remuneration for services rendered. Remunerations for services are not linked to approval by decision making authorities and PB Consult have no interest in secondary or downstream development as a result of the authorization of this proposed project. There are no circumstances that compromise the objectivity of this report. The findings, results, observations and recommendations given in this report are based on the author's best scientific and professional knowledge and available information. PB Consult reserve the right to modify aspects of this report, including the recommendations if new information become available which may have a significant impact on the findings of this report.

### **RELEVANT QUALIFICATIONS & EXPERIENCE OF THE AUTHOR**

Mr. Botes is a registered Professional Botanical, Environmental and Ecological Scientists at SACNASP (South African Council for Natural Scientific Professions) as required in terms of Section 18(1)(a) of the Natural Scientific Professions Act, 2003, since 2005 and holds a BSc. (Hons.) degree in Plant Ecology from the University of Stellenbosch (Nature Conservation III & IV as extra subjects).

Since qualifying with his degree, he had worked for more than 20 years in the environmental management field, first at the Overberg Test Range (a Division of Denel) managing the environmental department of OTB and being responsible for developing and implementing an ISO14001 environmental management system, ensuring environmental compliance, performing environmental risk assessments with regards to missile tests and planning the management of the 26 000 ha of natural veld, working closely with CapeNature (De Hoop Nature Reserve). In 2005 he joined Enviroscentific, an independent environmental consultancy specializing in wastewater management, botanical and biodiversity assessments, developing environmental management plans and strategies, environmental control work as well as doing environmental compliance audits and was also responsible for helping develop the biodiversity part of the Farming for the Future audit system implemented by Woolworths. During his time with Enviroscentific he performed more than 400 biodiversity and environmental legal compliance audits. During 2010 he joined EnviroAfrica in order to move back to the biodiversity aspects of environmental management. Experience with EnviroAfrica includes EIA applications, biodiversity assessment, botanical assessment, environmental compliance audits and environmental control work. During 2017, Mr. Botes started to work full time in his own small business (PB Consult) as an independent environmental specialist.

Yours sincerely,



**P.J.J. Botes** (*Pr.Sci.Nat: 400184/05*)  
Registered Professional Botanical, Environmental and Ecological Scientist

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Photo 13 and 14 showed some of the dumping sites, while Photo 15 & 16 shows some of the areas where fire wood cutting are taking place.



Photo 15: Trees being felled for their wood



Photo 16: Older trees, felled for their wood

The site is clearly degraded to the point of being transformed. Very few indigenous plant species remains on site (covering less than 5% of the area) and they were all hardy shrubs or pioneer species. It is considered unlikely that the natural veld will ever be able to re-establish itself on the site.

The small seasonal stream is similarly degraded, with almost no riparian vegetation remaining (Photo 5 & 6). Ideally one should try to rehabilitate this stream and re-establish natural riparian vegetation. However, this will not happen under the current land use, but it is possible to make the stream a feature of the memorial park and to rehabilitate it to a more natural state.

## 6. RECOMMENDATIONS

Having evaluated the proposed site and its immediate surroundings, it is unlikely that the proposed development will lead to any significant impact on the biodiversity as a result of its placement. The site and its immediate surroundings are considered transformed with no natural veld remaining. Only a few hardy indigenous species remains.

However the following recommendations on impact minimization can ensure a potential positive environmental impact:

- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase.
- All alien plants and all waste must be removed from the site and its immediate surroundings.
- The small seasonal stream must be demarcated with a suitable buffer zone (approximately 5m on each side of the small stream, measured from the center of the stream should be enough in this case).
- The buffer zone (ecological support area) should be replanted with suitable indigenous vegetation (riparian vegetation).
- The seasonal stream and its buffer zone should be incorporated as a feature within the lay-out of the memorial park.
- Only indigenous plants should be used for any landscaping within the memorial park.
- All areas impacted as a result of construction must be rehabilitated on completion of the project.

A few indigenous plant species was observed, scattered in between the stands of alien plant species, mostly associated with the small seasonal to the south and east of the property, but a few plants were also observed in some of the open areas. The overall area covered by indigenous species was found to be less than 5% of the total property (potentially less than 1%). These indigenous species included a stand of the sedge *Tetraria thermalis* next to the small stream, a few individuals of *Searsia angustifolia* and *Searsia laevigata* (also near the stream) a few individuals of hardy species like slangbos (*Stoebe plumose*), *Asparagus* species, renosterbos (*Dicerthamnus rhinocerotis*), *Erepsia anceps* (one patch of approximately 5 individuals) and a few restioid and grass species.



Photo 9: *Searsia laevigata* to the south of the property

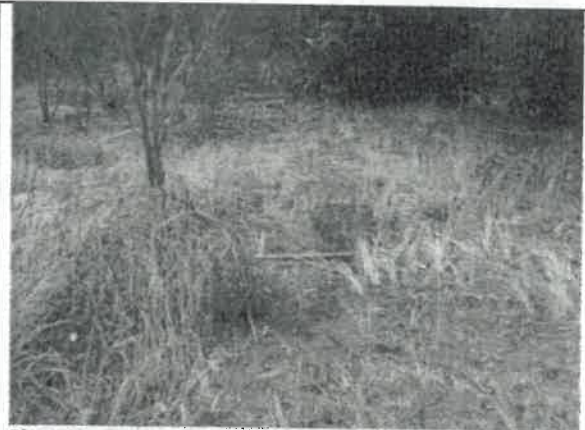


Photo 10: *Erepsia anceps* observed



Photo 11: A few individuals of the pioneer renosterbos species



Photo 12: A patch of sedges near the stream



Photo 13: Typical vegetation encountered throughout the site



Photo 14: One of the open patches encountered



## 5. VEGETATION ENCOUNTERED

The site visit confirmed that the Calcutta property is overgrown by a dense mix of alien invasive plant (AIP) species, dominated by *Eucalyptus* species and Port Jackson (*Acacia saligna*). No natural vegetation was encountered, apart from a few hardy remaining shrubs and sedges, which was mostly associated with the small seasonal stream. Apart from the dense stand of invasive species the site also showed a multitude of other disturbances, including sand mining activities, dumping and harvesting of fire wood (*Eucalyptus*) as well as individuals cutting fence poles.



Photo 3: The open area next to the R304 (regular brush cutting)



Photo 4: Typical vegetation just west of the small stream



Photo 5: The small seasonal stream, looking north



Photo 6: The seasonal stream, looking south



Photo 7: Typical vegetation encountered throughout the site



Photo 8: One of the open patches encountered

#### 4. NATIONAL LAND USE MAP

According to the 2014 Land cover Map the Calcutta site is expected to be covered by mature plantations or woodlots to the east of the small stream (Orange areas in Figure 4), while the areas west of the stream is likely to still be covered in shrubland fynbos (Green in Figure 4).

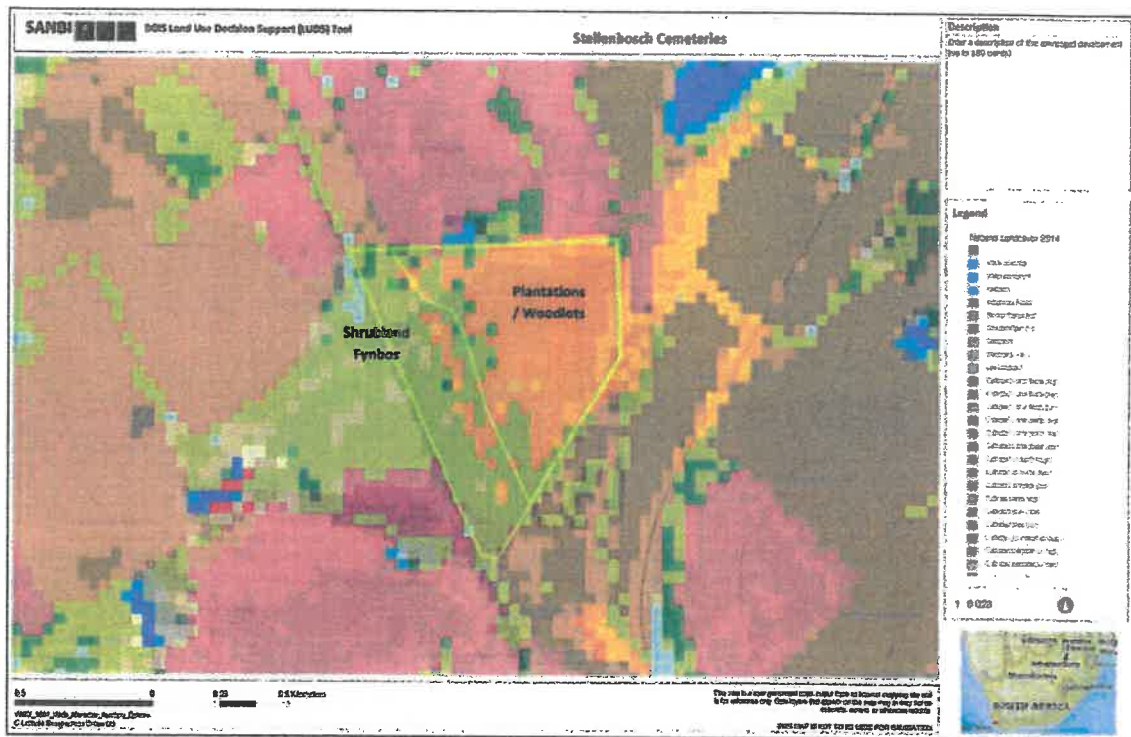


Figure 4: National Land Use map, indicating the status of the proposed site

The site visit confirms that the area to the east of the small stream is covered by dense alien invasive species (consistent with the National Land cover map), but the area to the east of the stream is has been degraded to an open grassland with no more shrubland or fynbos elements remaining (Refer to Picture 1 & 2).



Photo 1: Dense plantations to the east of the site



Photo 2: Open grassland next to the R304

area to the east of the small stream. The Western Cape Biodiversity Spatial Plan describes these features as follows:

- **ESA2:** Areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services. The aim must be to restore and/or manage to minimize impact on ecological processes and ecological infrastructure functioning, especially soil and water-related services, and to allow for faunal movement.
- **CBA2:** Areas in a degraded or secondary condition that is required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure. The aim should be to maintain them in a natural or near-natural state, with no further loss of habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land-uses are appropriate.

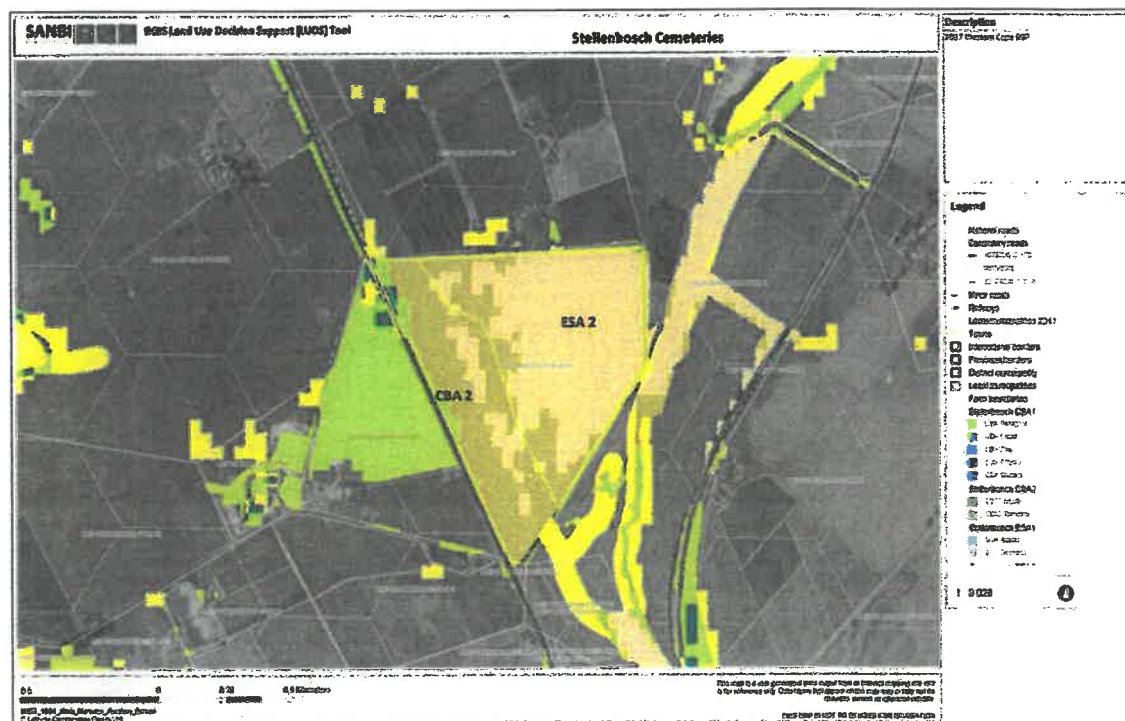


Figure 3: Western Cape Biodiversity Spatial Plan (2017) indicating the site location

In this case the ecological support areas associated with the small seasonal stream is potentially the only feature of significance which may be potentially restored. Both the CBA to the west and the ESA to the east of this little stream has been degraded to the point of being transformed. Connectivity is also mostly compromised, but with sensible planning the Calcutta site may still play a role as an potential ecological corridor (even though it is highly unlikely to ever be able to revert this area back to natural or near natural).

## 2. THE VEGETATION

According to the 2012 (beta 2) version of the Vegetation map of SA (Mucina & Rutherford, 2006) the site is located within an area that historically would have been covered by a vegetation type known as Swartland Shale Renosterveld (Figure 2). Swartland Shale Renosterveld is classified as a critically endangered vegetation type in terms of "List of ecosystems that are threatened and in need of protection" (GN 1002, December 2011), promulgated in terms of the National Environmental Management Biodiversity Act, Act 10 of 2004.

Mucina & Rutherford (2006) describe Swartland Shale Renosterveld as low to moderately tall leptophyllous shrubland of varying canopy cover as well as low, open shrubland dominated by renosterbos. Heuweltjies (old termite mounds) are a very prominent feature of this environment.

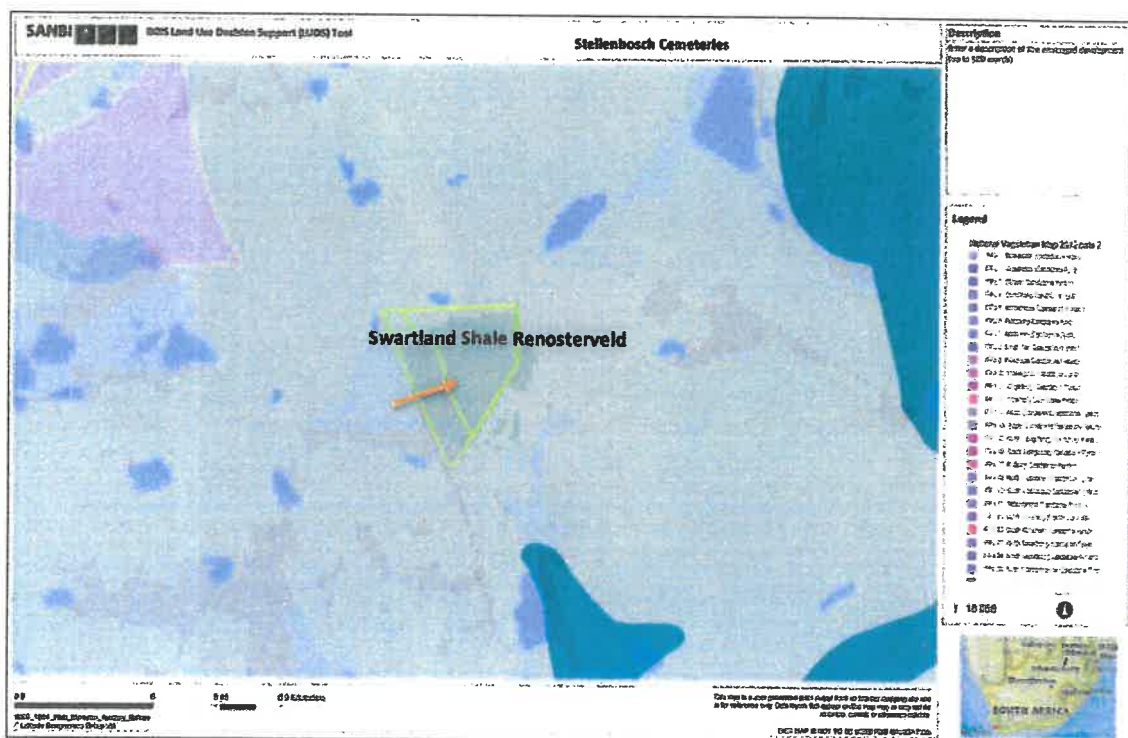


Figure 2: Vegetation map of South Africa (Mucina, Rutherford & Powrie, 2005) showing the property location

## 3. WITZENBERG CRITICAL BIODIVERSITY MAP

The 2017 Western Cape Biodiversity Spatial Plan (WCBS) includes a map of biodiversity importance for the entire province, covering both the terrestrial and freshwater realms, as well as major coastal and estuarine habitats (Pool-Stanvliet, 2017). The WCBS is the product of a systematic biodiversity plan that delineates, on a map, Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which require safeguarding to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services.

According to the Stellenbosch spatial dataset of the WCBS (Figure 3), Calcutta overlaps a proposed critical biodiversity area (Class 2) to the west of the small stream, an ecological support area (Class 2) associated with the small stream crossing the property and a terrestrial ecological support area (Class 2) associated with the

## 1.2. LOCATION & LAYOUT

In this report the Calcutta property refers to the Remainder of the Farm Calcutta No. 29, Stellenbosch. The Calcutta property is located just off the R304, about 10km due north of Stellenbosch, within the Stellenbosch Local Municipal area of the Western Cape Province. The property is about 39.881ha in size (Refer to Figure 1).

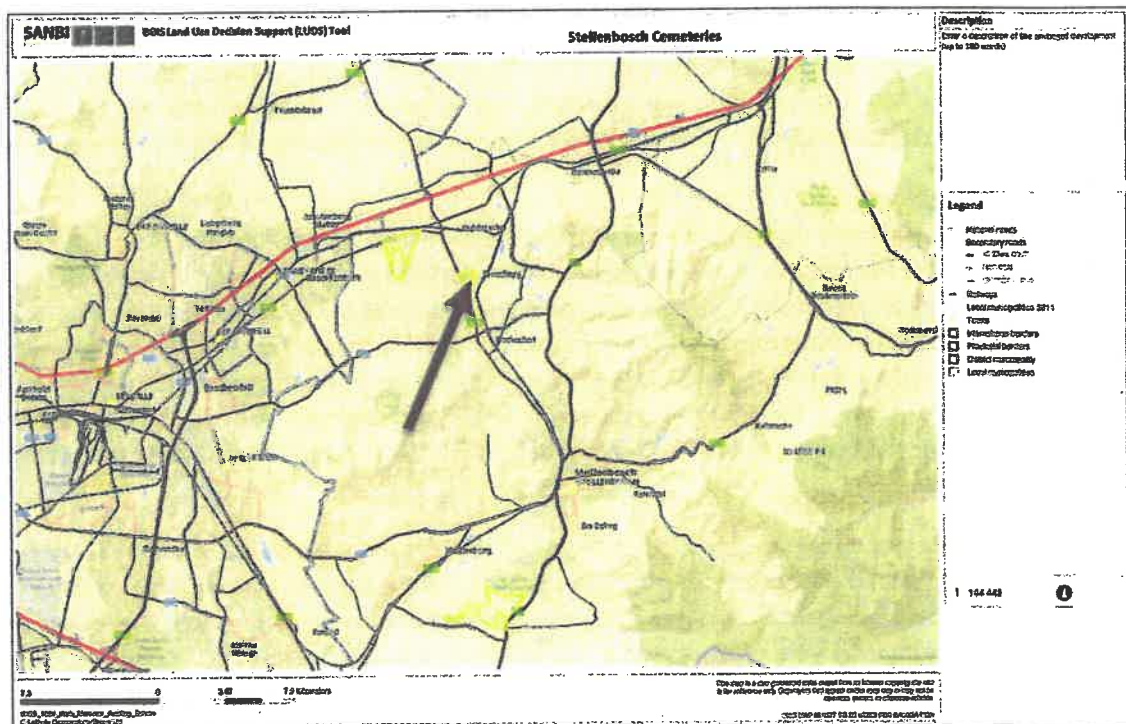


Figure 1: The location of the Calcutta property (indicated by the arrow) just north of Stellenbosch

The proposed memorial park is likely to cover all available land on the Calcutta property, but it was also taken into account that the layout of the memorial park can incorporate and accommodate various natural features (e.g. the small seasonal stream), which may even result in a beneficial impact over time.

## 1.3. EVALUATION METHOD

Desktop studies together with a site visit was performed to evaluate the proposed site in terms of potential impacts on botanical features of significance and to make recommendations on mitigation measures (should it be required). The site visit was conducted during January 2019. The timing of the site visit was not ideal, since most of the potential remaining bulb species would have been past flowering. Non-the-less, the site is so degraded that it is considered highly unlikely that any significant plant species would have survived.

## 1. INTRODUCTION

Stellenbosch Municipality is in urgent need to establishing additional communal cemeteries to service the larger Stellenbosch Municipal area. EnviroAfrica CC was appointed to conduct a screening and environmental assessment of potential sites (5 in total), owned by the Stellenbosch Municipality that may be suitable for this purpose. The remainder of Farm Calcutta No. 29 was one of the potential sites evaluated.

During 2017 EnviroAfrica, did a biodiversity scan of the various sites (Refer to Botes, 2017) in order to determine, which of the proposed sites are potentially viable (which included preliminary input from CapeNature). The biodiversity scan indicated that Calcutta (Rem. Of Farm Calcutta No. 29) may be a potential viable option.

The biodiversity scan indicated that the area had been transformed over time and is covered by dense alien invasive species like *Eucalyptus* (Blue Gums) and *Acacia saligna* (Port Jackson). This view was supported by the latest BGIS land use maps and the 2014 National Land cover map describes the site as being mostly covered by mature woodlots. However, according to the Western Cape Biodiversity Spatial Plan (2017) the site overlaps potential degraded critical biodiversity areas as well as ecological support areas (associated with the small seasonal water course crossing the property. As a result, one of the recommendations of the biodiversity study and CapeNature was that a further botanical scan of the site is done in order to determine the botanical significance of the site.

A site visit was performed during January 2019, during which the site was walked and scanned for potential remaining botanical features of significance. Although the timing of the site visit was not great, in that most bulb species would have been past flowering (a spring site visit would have been preferable), it was clear that the site has been degraded to the point of been transformed in terms of botanical significance. Only the occasional hardy indigenous species like "taaibos" *Asparagus*, renosterbos and a few restioid species was occasionally encountered, mostly associated with the small seasonal stream. Even along the small seasonal stream, potential riparian vegetation has been almost totally replaced by alien invasive plant species. Apart from the alien infestation the site also shows various physical disturbances, like sand mining activities, dumping and other human related disturbances.

In short there remains almost no natural veld or plant species of significance and it is considered highly unlikely that the veld would ever recover, even if all the alien plants were to be removed.

### 1.1. TERMS OF REFERENCE

The terms of reference for this appointment were to:

- Give a short statement on the vegetation and its conditions encountered at the site and its immediate surroundings.
- Determine and record the position of any plant species of special significance (e.g. protected tree species, or rare or endangered plant species) that should be avoided or that may require "search & rescue" intervention.
- Make recommendations on impact minimization should it be required

## 7. REFERENCES

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## **STELLENBOSCH MEMORIAL PARK**

**PROPOSED ESTABLISHMENT OF A MEMORIAL PARK (CEMETERIES), STELLENBOSCH MUNICIPALITY**  
On Portion 10 of the Farm De Novo No. 727, Remainder of the Farm Louw's Bos No. 502 and Remainder of the Farm Calcutta No. 29.

## **BIODIVERSITY SENSITIVITY MAPS**

**COMPILED BY: P.J.J. BOTES**  
**ENVIROAFRICA**

**DATE: 25 JULY 2017**



## DECLARATION OF INDEPENDENCE

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EnviroAfrica CC is an independent consulting firm, and has no interest in the activity other than fair remuneration for services rendered. Remunerations for services are not linked to approval by decision making authorities and EnviroAfrica have no interest in secondary or downstream development as a result of the outcome of this project. There are no circumstances that compromise the objectivity of this report.

The findings, results, observations and recommendations given in this report are based on the author's best scientific and professional knowledge and available information. EnviroAfrica reserves the right to modify aspects of this report, including the recommendations if new information becomes available which may have a significant impact on the findings of this report.



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P.J.J. Botes (Pri Sci Nat)  
*EnviroAfrica*

## EXECUTIVE SUMMARY

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**De Noso:** Even though the site is highly degraded, the southern portion of De Noso **MUST** be regarded as potentially very sensitive in terms of biodiversity. The primary concern on this site would be the presence of wetlands, particularly in the southern section. There is also a locality of a Critically Endangered species for this site (*Babiana regia*). Even if the site is highly degraded, this seasonal wetland habitat transitional between Cape Flats Sand Fynbos and Swartland Shale Renosterveld is extremely threatened and there are many species which are restricted to this habitat. It is considered imperative that a botanical assessment (at the right time of the year) and a wetland specialist study must be performed to inform potential development areas.

**From a biodiversity perspective De Noso is potentially the most sensitive of the three sites investigated.**

**Louw's Bos:** A number of potential options for development exist, in particular with regards to the cultivated and fallow lands. The pine infested area may have potential, but a botanical assessment will have to inform potential development areas. The proposed Western By-Pass must also be taken into consideration as it may pass through this site.

**From a biodiversity perspective Louw's Bos have a number of potential development areas, especially to the west within the cultivated areas or fallow lands.**

**Calcutta:** The whole of the property has been degraded as a result of dense stands of the alien infestation. Even though it is also identified as a potential critical biodiversity area, it is regarded as degraded, and of potentially lesser ecological importance than for instance De Noso. However, a botanical assessment is recommended in order to advise (ground-truth) potential significant vegetation.

**From a biodiversity perspective Calcutta is a potentially viable development area and should be considered of lower significance than De Noso.**

For all three sites, a spring botanical survey would be required, even though the habitat in all three cases is highly degraded, since there are often still remaining populations of **highly threatened spring flowering geophyte species** in these degraded remnants of Renosterveld (the shrub cover normally being lost).

Lastly: In cases where there is a threatened species population in very highly degraded/transformed habitat, the option of search and rescue can be considered, but *in situ* conservation is always preferred. Search and rescue would only be considered in exceptional cases where the species has a high chance of survival and suitable receptor site is available.

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## 1. INTRODUCTION

Stellenbosch Municipality is in urgent need to establishing additional communal cemeteries to service the larger Stellenbosch Municipal area. In order to meet expected demands, they require 3 sites approximately 30ha each. The cemeteries will take the form of memorial parks, which would allow significant leeway for walkways and landscaping (which could take the form of natural corridors).

EnviroAfrica was tasked to do a preliminary biodiversity scan on 3 potential sites of which 2 is likely to be used. The three sites are:

1. **De Novo (Northern District):** Portion 10 of the Farm De Novo, No. 727, approximately 192 ha in size.
2. **Louw's Bos (Central District):** Remainder of Farm 502, approximately 217 ha in size.
3. **Calcutta (as an alternative for De Novo):** Remainder of Farm Calcutta No. 29, approximately 39 ha in size.

### 1.1 ABBREVIATIONS USED

CBA	Critical Biodiversity Area
ESA	Ecological Support Area
WCBSP	Western Cape Biodiversity Spatial Plan (2017)

### 1.2 DESKTOP SCANS

The 2017 Western Cape Biodiversity Spatial Plan (WCBSP) includes a map of biodiversity importance for the entire province, covering both the terrestrial and freshwater realms, as well as major coastal and estuarine habitats.

CBA1 are critical biodiversity areas (CBA's) that are likely to be in a natural condition and CBA2 are ones that are potentially degraded or represent secondary vegetation. This distinction is based on best available land cover data, and therefore may not be an entirely accurate or current reflection of condition. Site visits are recommended to verify habitat condition. Similarly, a distinction is made between ecological support areas (ESA's) that are likely to be functional (i.e., in a natural, near-natural or moderately degraded condition; ESA 1), and Ecological Support Areas that are likely severely degraded or have no natural cover remaining and therefore require restoration where feasible (ESA 2).

Importantly, both CBAs and ESAs are further divided into sub-categories which recognise important inherent attributes of the site, allowing for greater specificity in applying land-use guidelines. The sub-categories should be used in conjunction with the WCBSP Handbook and its proposed land use guidelines.

The following are a short summary of the findings per site with regards to a desktop scan using the 2017 WCBSP as reference.

### 1.3 SITE VISIT

A physical site visit was performed on the 12 of July 2017 (middle of the winter). The site visit comprised of walking a driving the sites, whilst photographing and marking any feature of special significance in term biodiversity.

## 2. DE NOVO

De Novo is located just off the R101, about 16 km North of Stellenbosch.

**Size:** Approximately 192 ha

**Land use:** Slightly more than half of the property is occupied by small holdings and houses and other buildings (including a rehabilitation centre). The remainder of the property is used for grazing purposes. The lack of natural vegetation suggests that the property must have either been ploughed at some stage or was subjected to intensive grazing and regular burning over a long period of time.

**Available area:** Figure 1, shows the property boundaries in blue and the potential available land for development in orange. The most suitable location for the proposed memorial park would be the southern extent of the property (away from the existing small holdings, in order to minimise impact).

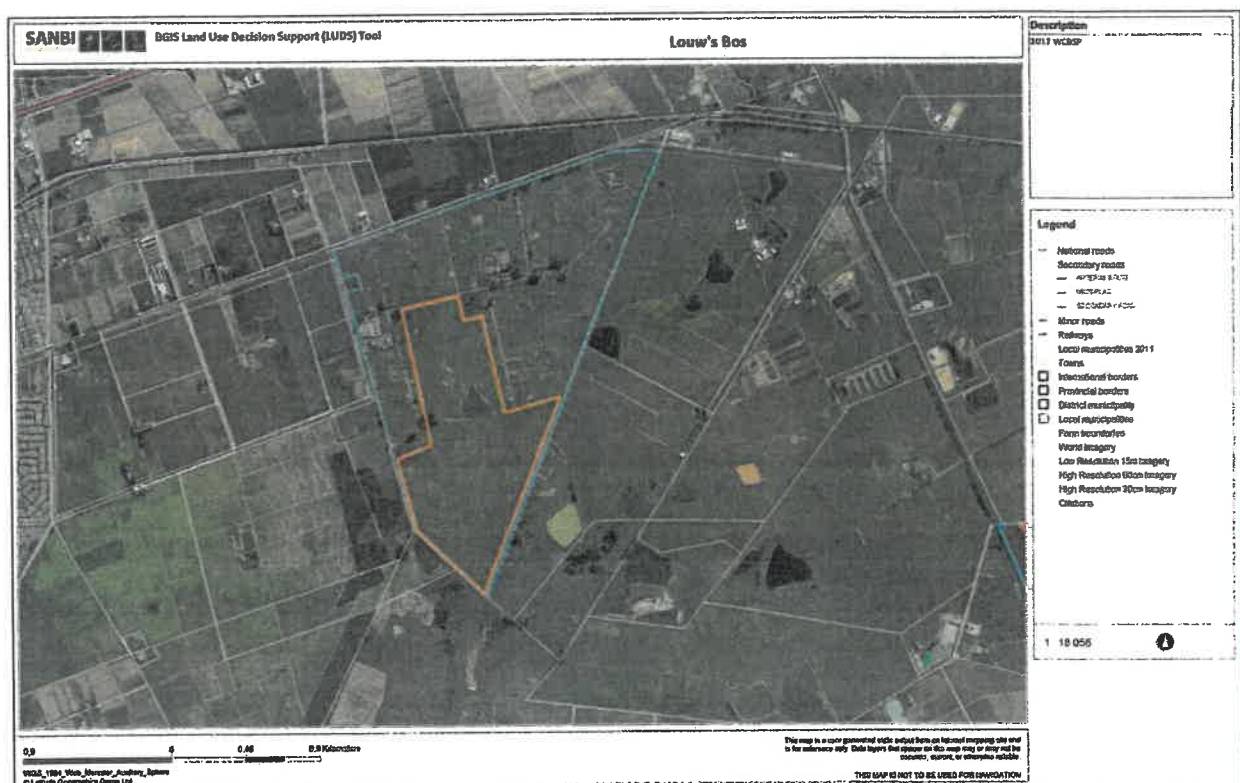


Figure 1: De Novo farm (blue) with the potential larger area for placement of the 30 ha memorial park in orange

**Potential restrictions:** Figure 2 shows that according to the Western Cape Biodiversity Spatial Plan, most of the area proposed for the development are within potential critical biodiversity-, or ecological support areas, which includes:

**CBA 1 (Green) – terrestrial critical biodiversity areas (potentially supporting critically endangered vegetation of very high importance especially transitional vegetation between Cape Flats Sand Fynbos and Swartland Shale Renosterveld. Transitional vegetation is always regarded as of high importance as it is often the areas were rare and endangered species may be found – areas of speciation)**

**CBA 1 (Blue) – aquatic critical biodiversity areas (potential wetlands). The potential wetlands in combination with transitional vegetation can give the site even higher**

importance.

ESA 2 (Yellow) – aquatic ecological support areas (potential watercourses)

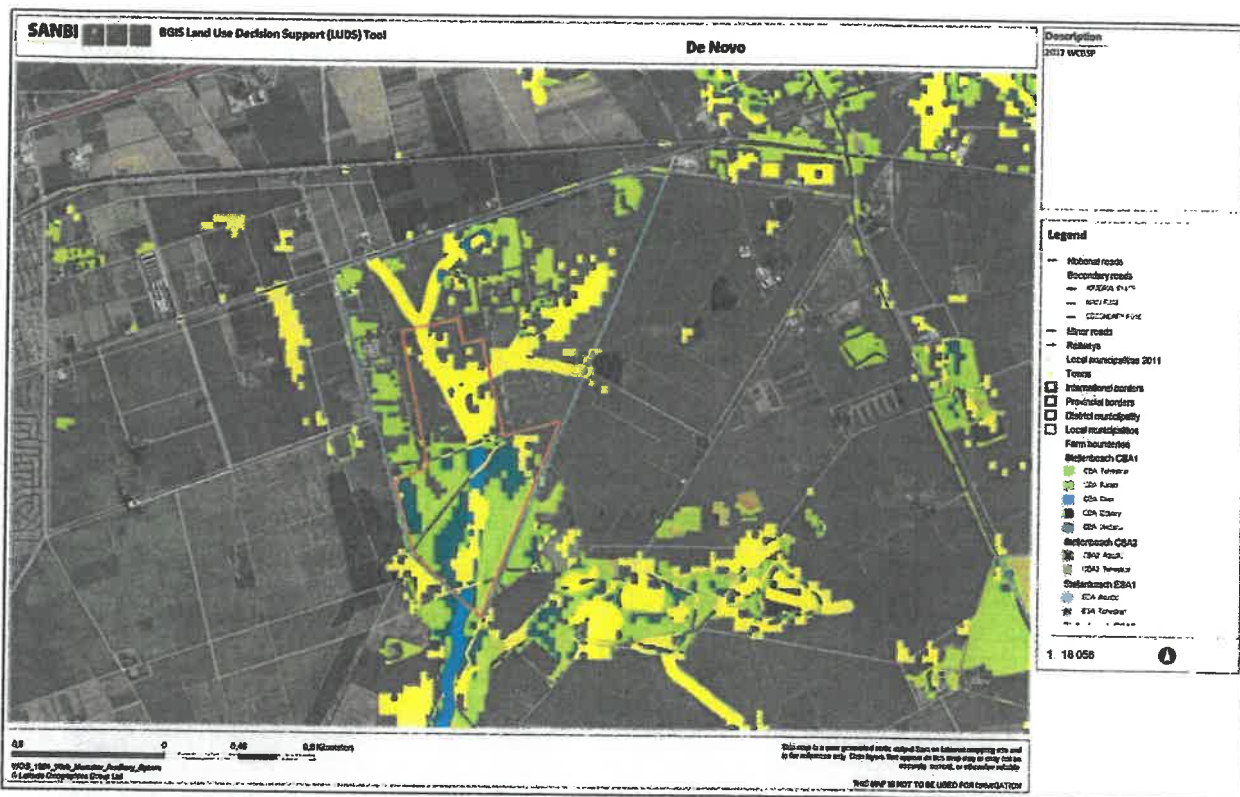


Figure 2: Western Cape Biodiversity Spatial Plan overlaid onto the property

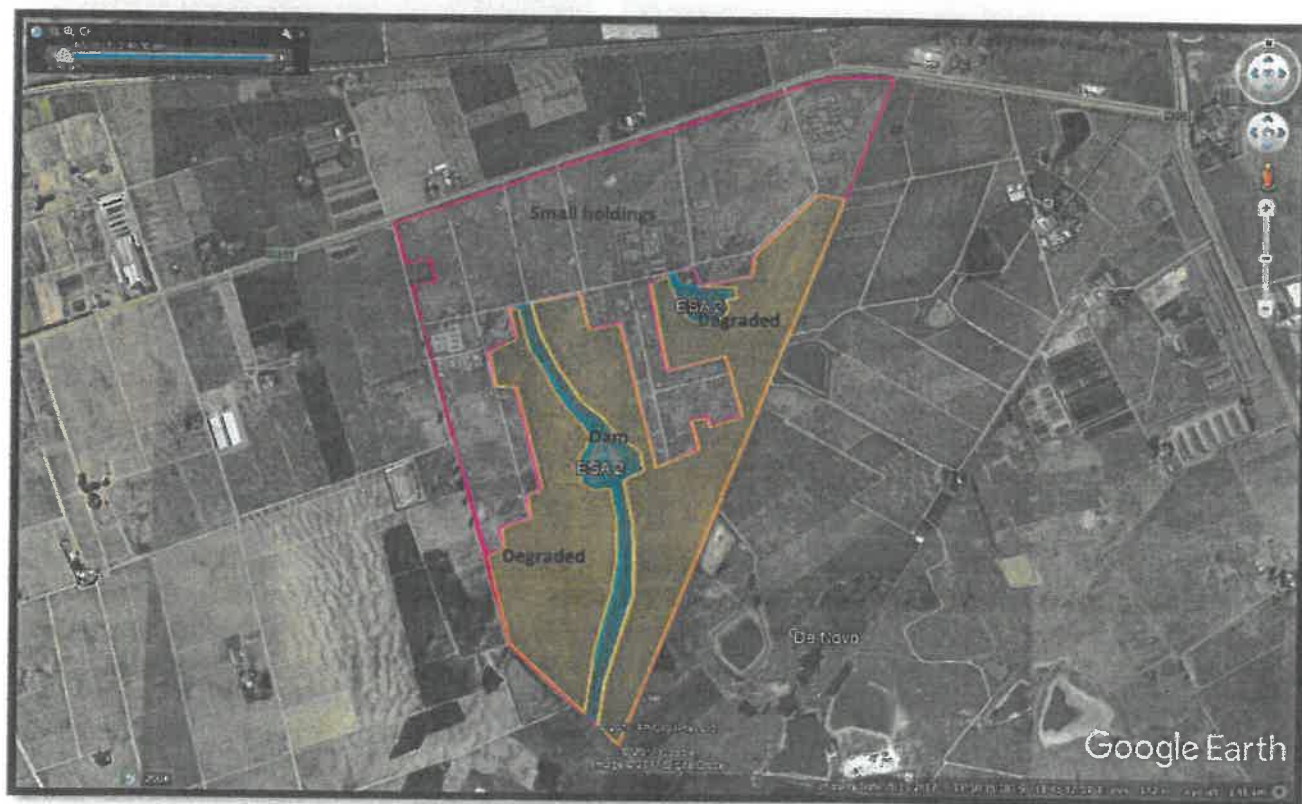


Figure 3: Google image showing potential remaining sensitive areas, based on a physical site visit (preliminary scan)

A preliminary site inspection, however, showed that basically the whole property has been degraded over time to such an extent that very little natural veld remains on the property. The site visit also did not show any physical evidence of wetlands and also indicated that the original watercourse has been degraded and has lost almost all of its riparian vegetation. The lack of natural vegetation suggest that the property was either subjected to intensive grazing coupled by frequent burning or more likely must have been ploughed at some stage. Figure 3 illustrates the preliminary findings of the site visit, indicating the area affected by smallholdings and buildings in pink, potential ecological support areas associated with the remaining watercourses in blue and the degraded areas in orange.



Photo 1: Vegetation to the north of the small farm dam (E-W)



Photo 2: Watercourse leading to the small farm dam (N-S)



Photo 3: Small farm dam on the property (looking from N-S)



Photo 4: Degraded vegetation to the south of the small dam (N-S)

## 2.1 CAPENATURE COMMENTS – DE NOSO

The following preliminary comments were received from CapeNature (Mr. Rhett Smart) with regards to De Noso:

*"I am aware that there are issues on this site with the community residing there wanting housing. There was an application for an Eskom Substation and connecting power line on the site that we assessed. We can provide you with the terrestrial and freshwater ecology studies for this project, although we did have concerns with the studies. The primary concern on this site would be the presence of wetlands, particularly in the southern section. There is also a locality of a Critically Endangered species for this site (Babiana regia). Even if the site is highly degraded, this seasonal wetland habitat transitional between Cape Flats Sand Fynbos and Swartland Shale Renosterveld is extremely threatened and there are many species which are restricted to this habitat. In terms of the power line alternatives we recommended the northern option near the residences but the southern option was authorised. Cemeteries would be of particular concern in*

*wetlands due to impacts on groundwater. There may however be opportunities for development in the north of the site, but that depends on the proposals for the community."*

## 2.2 RECOMMENDATIONS – DE NOVO

Although the site visit clearly showed that property is more likely to be described as degraded (Refer to Photo 1 to Photo 4), than pristine natural vegetation (or even degraded natural vegetation) it may still support geophyte and annuals of potential ecological value. Since the proposed development footprint will impact on potential critical vegetation and wetlands, especially potential critically endangered transitional vegetation in combination with wetlands, the precautionary approach must be applied. It is also possible that seasonal wetlands may occur and according to CapeNature a substation has been approved on the site. As a result the following is recommended:

- The southern portion of De Noso should be regarded as very sensitive (even though it seems degraded). The northern portions of De Noso would be more suitable from an ecological point of view (although this is likely not a practical solution).
- The areas marked in blue in Figure 3 should be regarded as ecological support areas and should be protected or even rehabilitated if possible.
- The degraded (orange areas) can be investigated for potential development, but a botanical scan/assessment done **during spring**, should be commissioned in order to evaluate potential remaining geophytes and annuals.
- A freshwater specialist should be appointed to investigate potential wetland areas on site.
- The outcome of the specialist studies should be presented and discussed with CapeNature.

From a biodiversity perspective, Calcutta would be a much more appropriate option for the location of the proposed cemeteries.

## 3. LOUW'S BOS

Louw's Bos is located just south (approximately 8 km) of Stellenbosch on the same property which where the Stellenbosch Airfield is located.

- Size:** Approximately 217 ha
- Land use:** The Stellenbosch Air field occupies approximately 40 ha of this property, while a further 50 – 60 ha are still covered under old Pine plantations. Smallholdings occupies roughly a further 10ha, while the remainder (>100 ha) is ploughed agricultural land (under cultivation).
- Available area:** Figure 4 shows the property boundaries in orange and the potential available land for development in blue.
- Potential restrictions:** Figure 5 shows that according to the Western Cape Biodiversity Spatial Plan, the property includes areas of potential ecological significance, but large areas of known degraded land is available for the proposed development. The ecological important areas includes:
- CBA 1 (Green) – terrestrial critical biodiversity areas (potentially supporting critically endangered vegetation – Swartland Granite Renosterveld)
  - CBA 2 (Brown) – degraded areas but with potential for rehabilitation
  - ESA 2 (Yellow) – aquatic ecological support areas (potential watercourses)



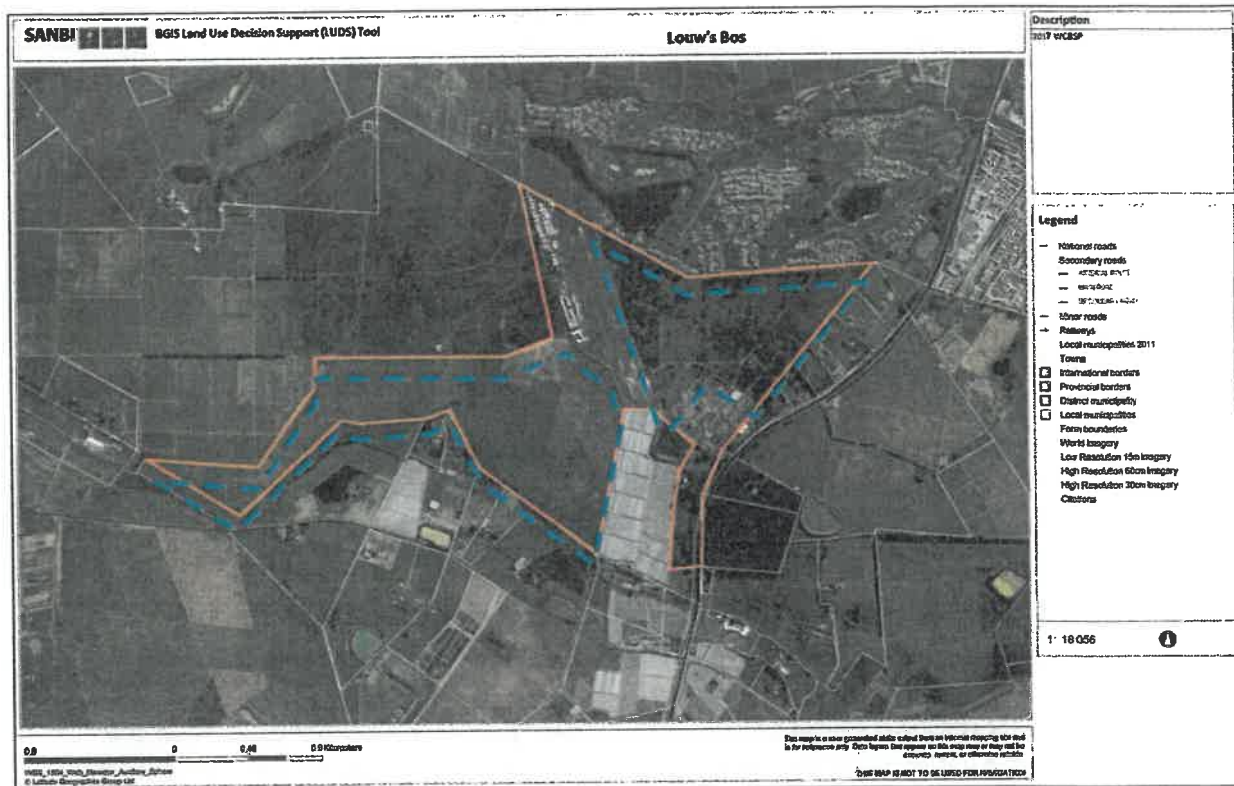


Figure 4: Louw's Bos farm (Orange) with the potential larger area for placement of the 30 ha memorial park in blue

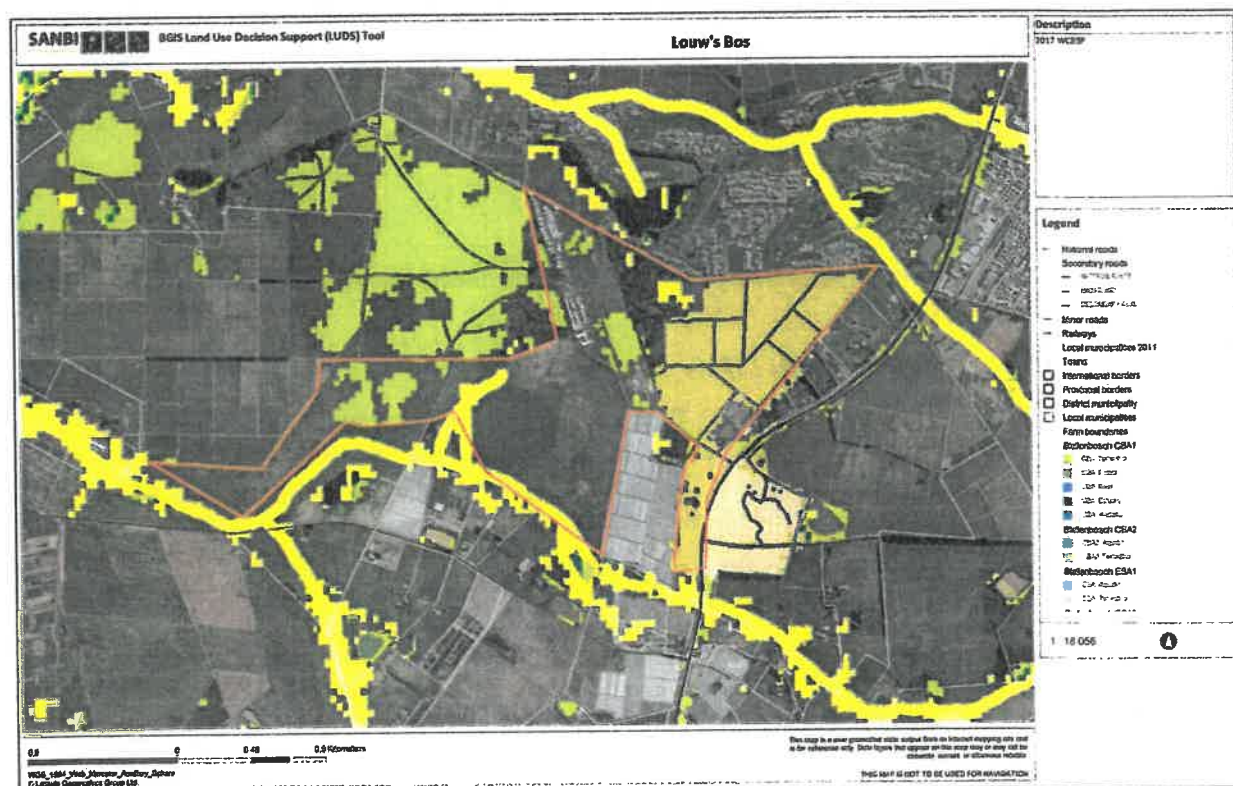


Figure 5: Western Cape Biodiversity Spatial Plan overlaid onto the property

A site inspection, however, showed that apart from the airfield, other build-up areas (Pink in Figure 6) and the old Pine Forest (Green in Figure 6) almost all of the property south of the airfield has been transformed as a result of agriculture (Orange in Figure 6) (Photo 5 to Photo 7). Please note that it was not possible to access

the Pine Forest portion of the property and as a result no comments can be made on the status of any remaining natural veld in this area. However, the fringes of the Airfield and the Pine Forest still supported some natural vegetation (Photo 8) and it is to be expected that natural vegetation may still be found in open areas within the Pine Forest area.

A small watercourse (with an associated seepage area) was observed within the site as well as some remaining riparian vegetation to the far west of the property (Blue areas in Figure 6).



Figure 6: Google image showing potential remaining sensitive areas, based on a physical site visit (preliminary scan)

### 3.1 CAPENATURE COMMENTS: LOUW'S BOS

The following preliminary comments were received from CapeNature (Mr. Rhett Smart) with regards to De Noso:

*"This is quite a large site and therefore there may be opportunities. In particular the cultivated and fallow lands would present an opportunity. The pine infested area in the east could be considered restorable but is definitely degraded. The proposed Western By-Pass must be taken into consideration as the alignment I have seen passes through this site. We do have concerns regarding that alignment, but not on this property, more on the adjacent Spier property."*



Photo 5: Agricultural land to the west of the property (E-W)



Photo 6: Watercourse and seepage area – also degraded (W-E)



Photo 7: Agricultural land adjacent to the strawberry farm (N-S)



Photo 8: Remaining natural veld on the fringes of the airfield (N-S)

### 3.2 **RECOMMENDATIONS – LOUW'S BOS**

Since the proposed development footprint will impact on potential CBA and ESA areas, the precautionary approach must be applied. As a result the following is recommended:

- The areas marked in blue in Figure 6 should be regarded as ecological support areas and should be protected or even rehabilitated if possible.
- The transformed agricultural land (orange areas in Figure 6) should be regarded as first option for development.
- As a precautionary approach the Pine Forest area (green in Figure 6) should be excluded unless a botanical assessment ascertain that the area is not of ecological importance.
- The outcome of the specialist studies should be presented and discussed with CapeNature.

## 4. CALCUTTA

Calcutta is considered a potential alternative for De Novo and is located approximately 10 km north of Stellenbosch, directly off the R304.

**Size:** Approximately 39 ha

**Land use:** The property is not used for any specific purpose, but can be described as a *Eucalyptus* plantation (with *Acacia saligna* also prominent) and is densely covered by these alien plant species.

**Available area:** Figure 7 shows the property boundaries in blue and the potential available land for development in orange. The proposed development should aim to miss the ecological support area associated with the small watercourse (a tributary to the Plankenburg River) crossing the property to its western boundary.

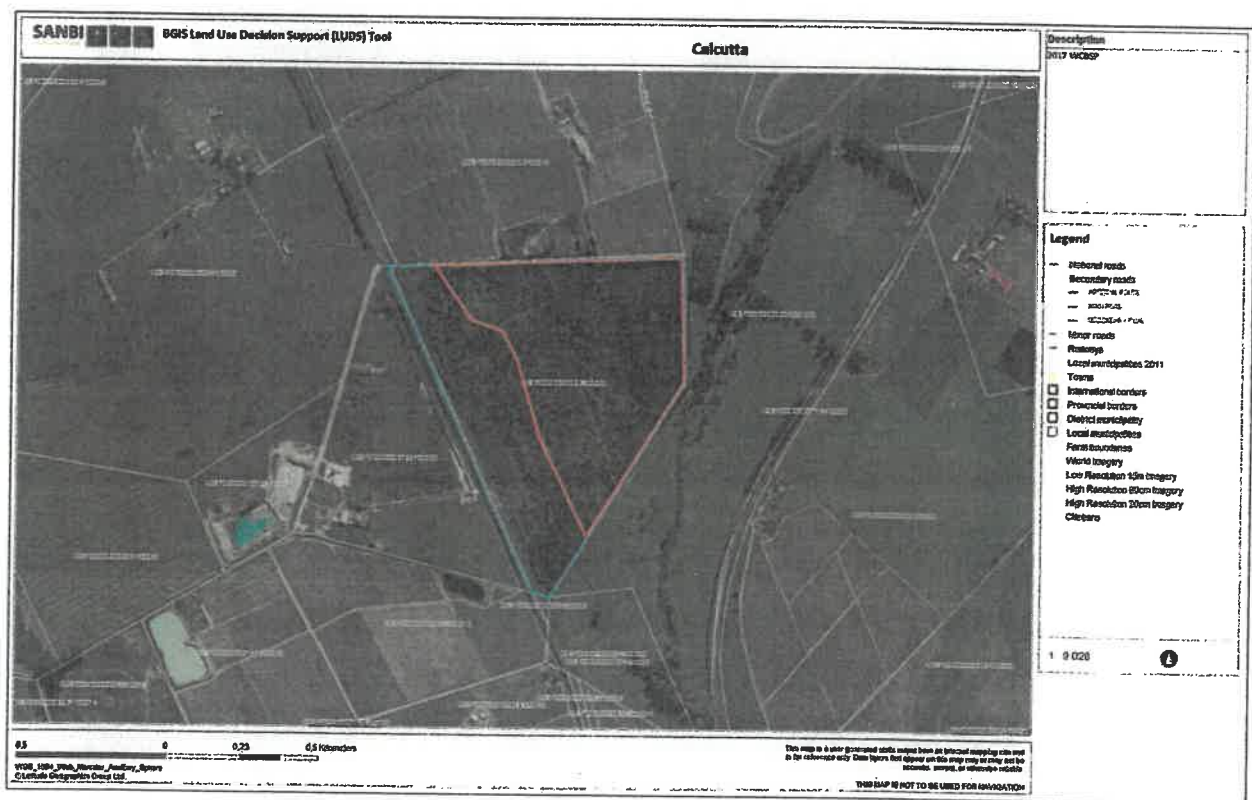


Figure 7: Calcutta farm (Blue) with the potential area for placement of the 30 ha memorial park in orange

**Potential restrictions:** Figure 8 shows that according to the Western Cape Biodiversity Spatial Plan, most of the area proposed for the development are within potential critical biodiversity-, or ecological support areas, which includes:

**CBA 2 (Brown)** – degraded areas but with potential for rehabilitation.

**ESA 2 (Yellow)** – ecological support areas (associated with watercourses or plantations)

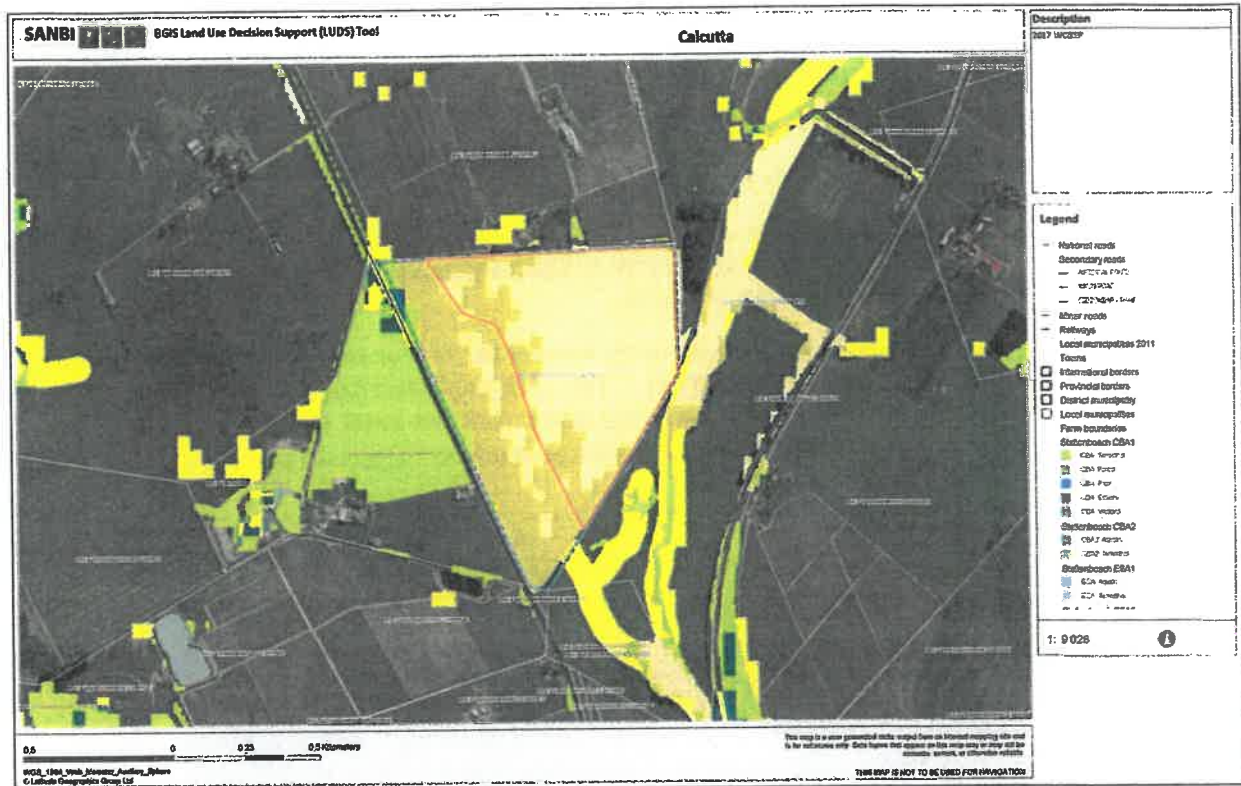


Figure 8: Western Cape Biodiversity Spatial Plan overlaid onto the property

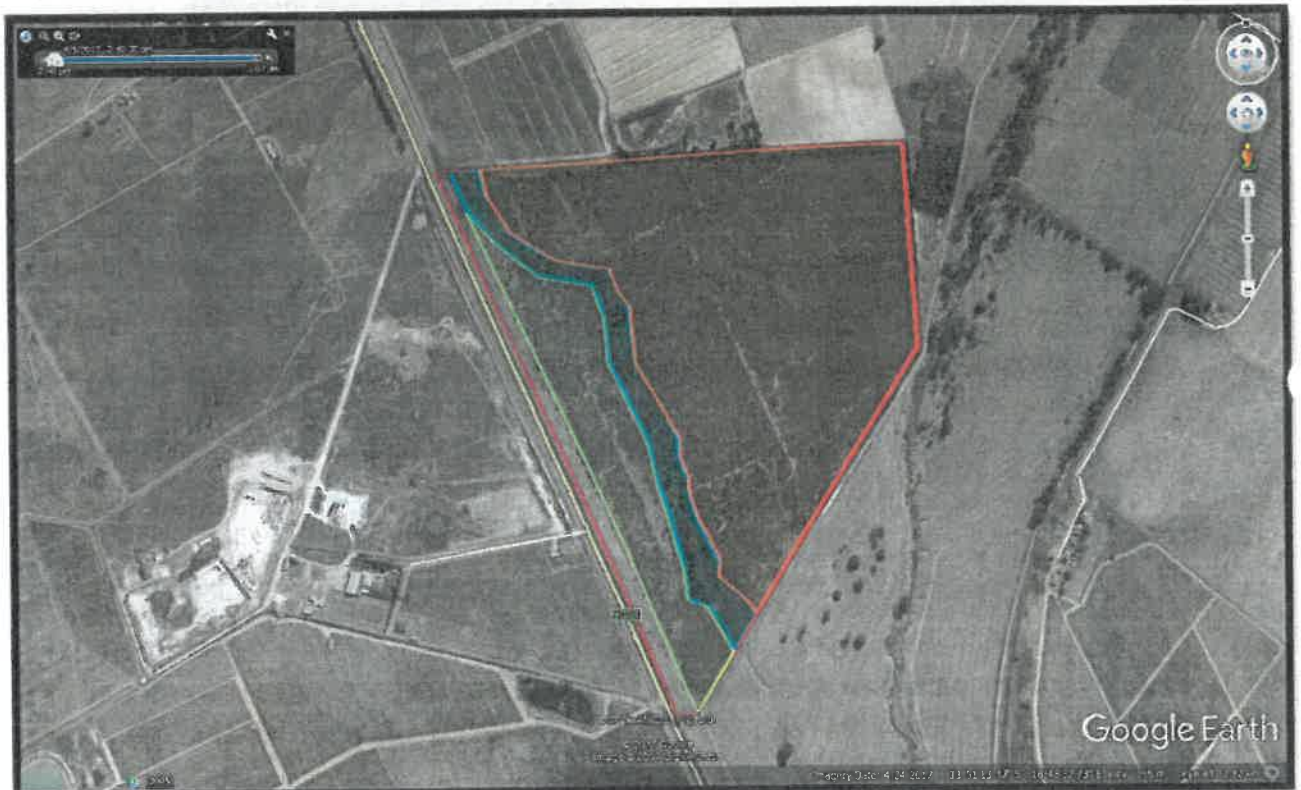


Figure 9: Google image showing potential remaining sensitive areas, based on a physical site visit (preliminary scan)

A physical site inspection showed that the whole of the property has been degraded as a result of dense stands of the alien tree *Eucalyptus*, but with *Acacia saligna* also prominent (Photo 9 to Photo 12). Very few remaining natural plant species was observed, but a small watercourse cross the property from north to south

along its western boundary (Photo 11, blue in Figure 9). The area mark in green in Figure 9 is also degraded as a result of dense alien plant infestation (Photo 12), but was marked separately because of its potential CBA status.



Photo 9: Alien infestation to the south of the property (W-E)



Photo 10: A view of the property along its eastern boundary (S-N)



Photo 11: Small stream crossing the property (N-S)



Photo 12: Eucalyptus infested fringes next to the R304 (W-E)

#### 4.1 CAPENATURE COMMENTS: CALCUTTA

The following preliminary comments were received from CapeNature (Mr. Rhett Smart) with regards to De Noso:

*"This site does seem heavily infested with aliens from the road and would need ground-truthing to check if there is any natural vegetation in the understory. However based on your inputs below there isn't really anything else left."*

#### 4.2 RECOMMENDATIONS – CALCUTTA

Since the proposed development footprint will impact on potential CBA and ESA areas, the precautionary approach must be applied. As a result the following is recommended:

- The areas marked in blue in Figure 9 should be regarded as ecological support areas and should be protected or even rehabilitated if possible.
- The area marked in green in Figure 9, should be retained (if possible) and rehabilitated with the ecological support area.

- The areas marked in orange in Figure 9, can potentially be investigated for development, but a botanical scan should be performed before such development is approved.
- The outcome of the specialist studies should be presented and discussed with CapeNature.

**ARCHAEOLOGICAL IMPACT ASSESSMENT**

**PROPOSED MUNICIPAL CEMETERY ON FARM No. 29  
CALCUTTA NEAR STELLENBOSCH, WESTERN CAPE**

Assessment conducted under Section 38 (3) of the National Heritage Resource  
Act (No. 25 of 1999)

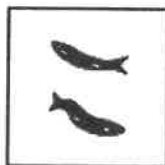
Prepared for:

CKR & Partners  
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Applicant:

**STELLENBOSCH MUNICIPALITY**

By



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**OCTOBER  
2018**



## AIA proposed Calcutta Cemetery near Stellenbosch

**Executive summary***1. Introduction*

ACRM was appointed by CKR to conduct an Archaeological Impact Assessment (AIA) for a proposed new municipal cemetery on Farm No. 29 near Stellenbosch in the Western Cape.

The site for the proposed Calcutta Cemetery, located alongside the R304, is infested with invasive Blue Gum trees, grasses and weeds. Leaf litter is thick on the ground. Several old gravel roads, tracks and barely visible footpaths cross the site, which is severely degraded. Dumping is also widespread.

The extent of the proposed development site is about 35ha, of which ± 30ha will be developed.

*2. Aim of the study*

The overall purpose of the study is to assess the sensitivity of archaeological resources in the proposed development site, to determine the potential impacts on such resources, and to avoid and/or minimise such impacts by means of management and/or mitigation measures.

The AIA forms part of a wider Heritage Impact Assessment (HIA) that will be conducted by Bruce Eitzen (New World Associates, Landscape Architects).

*3. Results of the study*

A field assessment of the subject property was undertaken on 18 October 2018, in which the following observations were made:

- No pre-colonial archaeological heritage was encountered during the study.
- No buildings, structures or features were noted.
- No remains associated with the historic Calcutta Bos Outspan were found.

Archaeological visibility is extremely low due to dense vegetation cover, but indications are that the receiving environment is not a sensitive archaeological landscape.

*4. Impact statement*

The results of the study indicate that the proposed construction of a new municipal cemetery on Farm No. 29 Calcutta, will not impact of important pre-colonial archaeological heritage.

Artefactual remains associated with the historic Calcutta Bos Outspan may, however, be revealed or exposed during preparation of the site for development.

AIA proposed Calcutta Cemetery near Stellenbosch

**5. Conclusion**

The study has identified no significant impacts to archaeological heritage that will need to be mitigated prior to the proposed development commencing.

**6. Recommendations**

The following recommendations are made:

1. No archaeological mitigation is required prior to construction activities commencing.
2. As a precaution, the site should be scanned for artefactual remains dating from the time of the Calcutta Bos Outspan, once vegetation has been cleared and removed from the site.

## AIA proposed Calcutta Cemetery near Stellenbosch

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## AIA proposed Calcutta Cemetery near Stellenbosch

**1. INTRODUCTION**

ACRM was appointed by CKR Town Planners to conduct an Archaeological Heritage Impact Assessment (AIA) for a proposed new municipal cemetery on the Farm Calcutta No. 29 on the outskirts of Stellenbosch in the Western Cape (Figures 1-4).

The proposed cemetery and memorial park will occupy a footprint area of about 30ha of the 35ha property. Associated infrastructure includes internal access roads, perimeter fencing, parking, a memorial wall, ablutions and a possible borehole.

The AIA forms part of a wider Heritage Impact Assessment (HIA) that will be conducted by Bruce Eitzen (New World Associates, Landscape Architects).

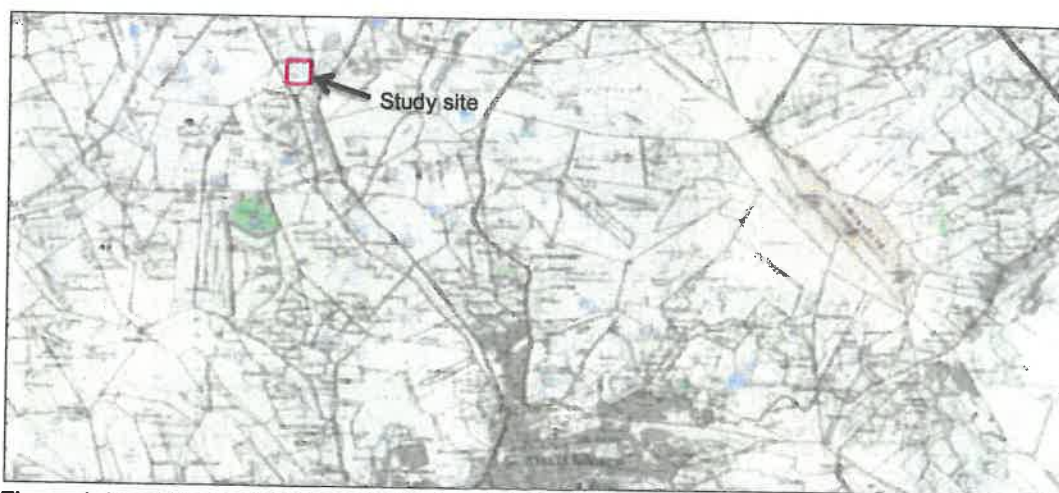


Figure 1. Locality map (3318DD Stellenbosch). Red polygon indicates the location of the site

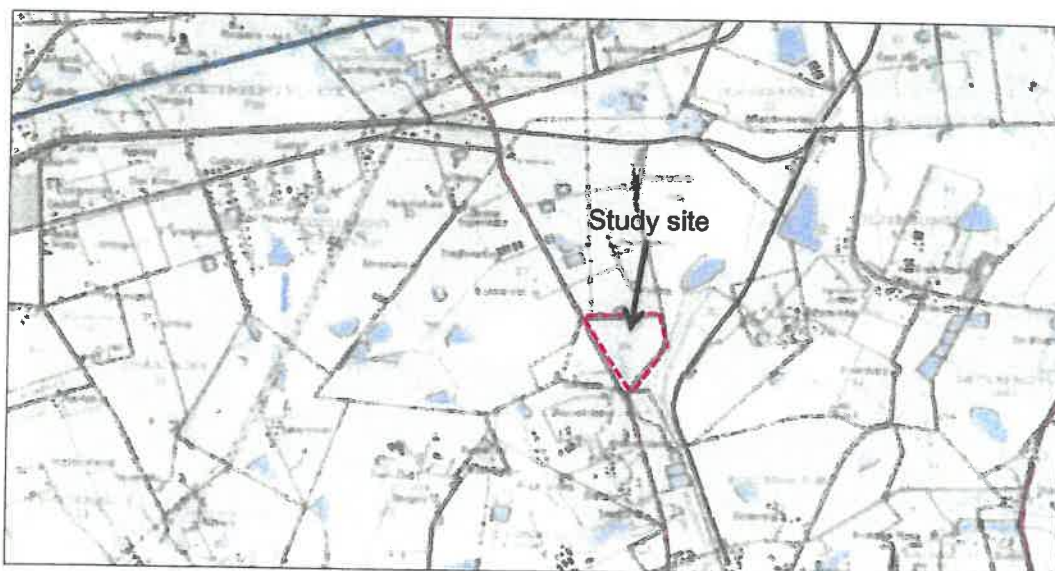


Figure 2. Close up of the proposed cemetery site on Farm Calcutta No. 29, near Stellenbosch

AIA proposed Calcutta Cemetery near Stellenbosch

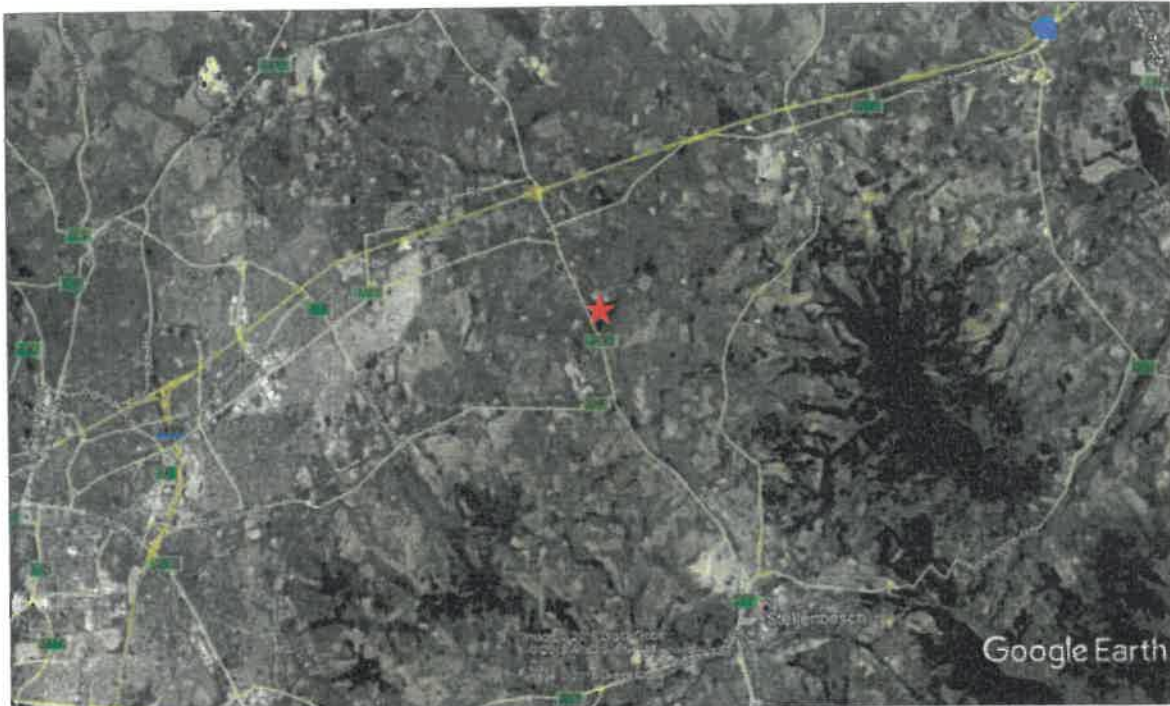


Figure 3. Google aerial map indicating the location of the proposed development site (red polygon).



Figure 4. Close up Google satellite map of the proposed Calcutta Cemetery site on Farm 29

## AIA proposed Calcutta Cemetery near Stellenbosch

**2. HERITAGE LEGISLATION**

The National Heritage Resources Act (Act No. 25 of 1999) makes provision for a compulsory Heritage Impact Assessment (HIA) when an area exceeding 5000 m<sup>2</sup> is being developed. This is to determine if the area contains heritage sites and to take the necessary steps to ensure that they are not damaged or destroyed during development.

**3. DESCRIPTION OF THE RECEIVING ENVIRONMENT**

The proposed development site is located on the Farm Calcutta 29, just off the R304, about 10kms northwest of Stellenbosch. The proposed cemetery site is infested with invasive Blue Gum trees, thick Kikuyu grass, natural grasses (such as Restio), and weeds. Leaf litter lies thick on the ground. There are a number of small gravel roads, tracks and barely visible footpaths that crisscross the site. A small unnamed stream drains into the site from the southwest. Dumping of rubble and domestic waste is widespread. Current land use is small scale wood harvesting. There are no significant landscape features on the proposed development site, which is irrevocably transformed (Figures 5-16). Surrounding land use is agriculture (vineyards & grazing) and roads (R304).



Figure 5. View of the proposed development site facing north. Note the R304 to the left of the plate



Figure 6. View of the proposed development site facing north



Figure 7. View of the proposed development site facing south.



Figure 8. Panoramic view taken from the south eastern corner.



Figure 9. Panoramic view of the proposed cemetery site facing north east

AIA proposed Calcutta Cemetery near Stellenbosch

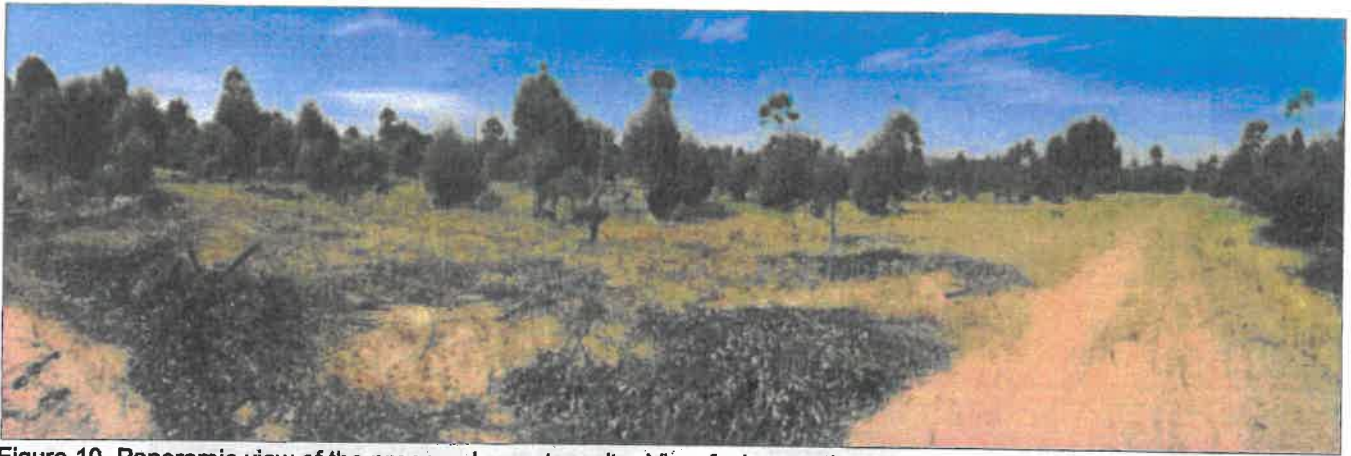


Figure 10. Panoramic view of the proposed cemetery site. View facing south east

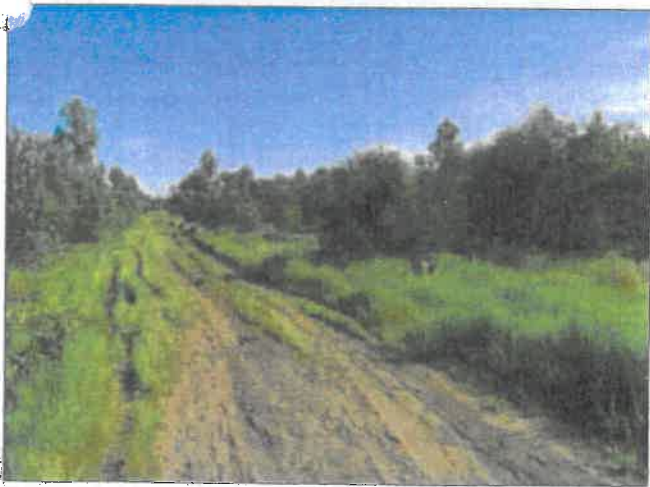


Figure 11. View of the proposed cemetery site facing east



Figure 12. View of the proposed cemetery site facing south



Figure 13. View of the proposed cemetery site facing east



Figure 14. View of the proposed cemetery site facing south





Figure 15. View of the proposed cemetery site facing south



Figure 16. View of the proposed cemetery site facing east

## 4. STUDY APPROACH

### 4.1 Method

The overall purpose of the study is to assess the sensitivity of archaeological resources in the proposed development site, to determine the potential impacts on such resources, and to avoid and/or minimise such impacts by means of management and/or mitigation measures.

A field assessment was undertaken by ACRM on 18<sup>th</sup> October, 2018. All gravel roads, and small tracks/footpaths were walked and the surrounding area searched for archaeological resources. A track path of the survey was also captured. A literature survey was carried out to assess the heritage context surrounding the proposed development site.

### 4.2 Constraints and limitations

The proposed development site is infested with invasive Blue Gum trees, winter grasses, weeds and dense leaf litter, resulting in very low/poor archaeological visibility.

### 4.3 Identification of potential risks

The results of the study have shown that there are no archaeological risks associated with the proposed development.

Artefactual remains dating to the time of the historic Calcutta Bos outspan may be uncovered during vegetation clearing of the site at the Construction Phase

### 4.4 Archaeology of the study area

Very little archaeological work has taken place along this stretch of road (R304) between Stellenbosch and the N1. Early Stone Age (ESA) and Middle Stone Age (MSA) have been recorded near Kayamandi and Papagaaiberg (Kaplan 2010, 2005) while ESA and

### AIA proposed Calcutta Cemetery near Stellenbosch

MSA tools have been recorded on the Farm Nooitgedacht, about 1.5kms south west of the proposed development site (Kaplan 2006). ESA tool particularly, are very common in old exposed, colluvial gravels, slope and gravel washes ((Peringuey 1902, 1911; Seddon 1966). The area is known for its wine farms, while a few smallholdings, brick quarry and some light industry are located nearby. The cultural landscape however, is dominated by agriculture where the receiving environment is almost completely transformed.

According to CTS Heritage (2018), the historic Outspan known as Calcutta Bos, is located on the proposed development site.

### 5. RESULTS OF THE STUDY

- No pre-colonial archaeological resources were located during the study.
- No buildings, structures, features, or any old equipment was noted.
- No artefactual remains associated with the historic Calcutta Bos Outspan were found.



Figure 17. Trackpaths in red.

## AIA proposed Calcutta Cemetery near Stellenbosch

**6. IMPACT STATEMENT**

The results of the study indicate that development of a new municipal cemetery on Farm No. 29 Calcutta will not have an impact of great significance on pre-colonial, archaeological heritage. Archaeological visibility was very low due to extremely dense vegetation cover, but indications are that the receiving environment is not a sensitive or threatened archaeological landscape.

Artefactual remains associated with the historic Calcutta Bos Outspan may, however, be revealed or exposed during preparation of the site for development.

**7. CONCLUSION**

The study has identified no significant impacts to archaeological heritage that will need to be mitigated prior to the proposed development commencing.

**8. RECOMMENDATIONS**

With regard to the proposed Calcutta Municipal Cemetery on Farm No. 29 near Stellenbosch, the following recommendations are made:

1. No mitigation is required prior to construction activities commencing.
2. As a precaution, the site should be scanned for artefactual remains dating from the time of the Calcutta Bos Outspan, once vegetation has been cleared and removed from the site.

## AIA proposed Calcutta Cemetery near Stellenbosch

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**Report to CK Rumboll & Partners on a Geotechnical Investigation carried out for the Culcatta RE/29, Cemetery Site, Stellenbosch, Western Cape**

**Project No.: 18-811R01**

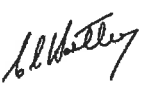

**Date Issued: May 2018**

**Report to CK Rumboll & Partners on a Geotechnical Investigation carried out for the  
Culcatta RE/29, Cemetery Site, Stellenbosch, Western Cape**

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	<b>PREPARED:</b>	<b>APPROVED:</b>
<b>DATE:</b>	May 2018	May 2018
<b>NAME:</b>	Colin Hartley	Mark Richter
<b>SIGNATURE:</b>		

## Report to CK Rumboll & Partners on a Geotechnical Investigation carried out for the Culcatta RE/29, Cemetery Site, Stellenbosch, Western Cape

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### 1. INTRODUCTION

As requested by Ms Anelia Coetzee of CK Rumboll & Partners, Gondwana Geo Solutions (Pty) Ltd (GGS) submitted a proposal to carry out a geotechnical investigation for the proposed Culcatta RE/29, Cemetery Site on the 28<sup>th</sup> February 2018.

The appointment of GGS to proceed as proposed was confirmed in a signed contract with CK Rumboll and Partners on the 27<sup>th</sup> March 2018.

The Phase 1, Preliminary Site Assessment comprised a desktop study of the area with a review of available information and meeting with local land owners, mapping of all surface water bodies and conducting a borehole and spring census of the area. This information is included in the Phase 2 report.

The Phase 2 geotechnical investigation comprised the excavation of nine trial pits at locations around the site. The trial pits were put down to obtain logging and sampling of the soils and, where possible, the depth to bedrock. Nine Dynamic Cone Penetrometer Light (DPL) Tests were carried out adjacent to the inspection pits to establish the consistency of the soils with depth.

Recommendations for the suitability of the site for use as a cemetery are provided.

### 2. INFORMATION SUPPLIED

The following information was supplied for use in the investigation:

- Google Earth Kmz file showing the site position.
- Site Development Plan. Ref: STEL/9494/AC/RB

### 3. SITE DESCRIPTION

The area on which the geotechnical investigations were carried out consist of a site with an area of 23.7Ha. The R304 surfaced road and road reserve bounds the site on the west side. Commercial farm land consisting of vineyards is located on the northern boundary while the eastern boundary is flanked by grassland with scattered small trees. A minor drainage line runs almost parallel to the road reserve on the west side. A second drainage line is situated on the east side of the site and runs in a north – south direction passing close to the eastern corner of the site, roughly parallel to the R304 road, and some 75m to 100m from the road itself. Both drainage lines were completely dry at the time of the investigation. The site locality is shown on Figure 1.

The site slopes gently towards the south west and south east and is thickly covered in Eucalyptus plantation regrowth and Port Jackson Willow trees, dead grass and weeds. The layout of the site is given in Figure 2.

Plates 1 and 2 below give a detailed perspective of the site.



Plate 1: Site viewed towards the east at TP4



Plate 2: Site viewed towards the west at TP4

#### 4. FIELDWORK

The fieldwork for the investigation was conducted during April 2018 and comprised the following:

- Trial Pits, and
- Dynamic Cone Penetrometer Light (DPL) Tests

##### 4.1 Trial Pits

The trial pits were excavated using a JCB3CX Tractor Loader Backhoe (TLB) supplied by Burcon Plant Hire from Cape Town.

Nine trial pits, designated TP1 through TP9 were put down at the location as shown in Figure 2 at the site. Trial pit TP1 refused on medium hard to hard rock sandstone, Trial Pits TP2, TP3, TP6, TP8 and TP9 terminated in clay at 3.10m, 3.40m, 3.00m, 3.20m and 3.30m respectively. Trial Pits TP4 and TP5 terminated in medium grained sand at a depth of 3.00m and 2.80m respectively, below existing ground level. Trial Pit TP7 refused in very dense ferricrete at 2.20m.

The trial holes were profiled<sup>1</sup> by an engineering geologist and representative soil samples recovered for laboratory testing at Geoscience Laboratories (Pty) Ltd in Cape Town. The detailed logs are provided in Appendix A.

Table 1 below indicates the locations and depths to which the trial holes were excavated.

**Table 1**  
**Summary of Trial Pit Details**

TP No.	GPS Coordinates (WGS84)		Depth (mbegl)	Comments
	19 Y	X		
TP1	0017838	3747151	2.20	Refusal. No groundwater
TP2	0017820	3747308	3.10	TLB Limit. No groundwater
TP3	0017704	3747564	3.40	TLB Limit. No groundwater
TP4	0017562	3747659	3.00	TLB Limit. No groundwater
TP5	0017329	3747440	2.80	TLB Limit. No groundwater
TP6	0017458	3747085	3.00	TLB Limit. No groundwater
TP7	0017635	3747169	2.20	Refusal. No groundwater
TP8	0017493	3747455	3.20	TLB Limit. No groundwater
TP9	0017283	3747239	3.30	TLB Limit. No groundwater

Note: mbegl = metres below existing ground level

<sup>1</sup> Geoterminology Workshop (2002) – Guidelines for Soil and Rock Logging - SAIEG-AEG-SAICE (Geotech Div) pp47



## 4.2 Dynamic Cone Penetrometer Light (DPL) Tests

Nine Dynamic Cone Penetrometer Light, or DPL tests, designated DPL1 to DPL9 were undertaken. All tests were undertaken from surface adjacent to the corresponding trial holes. A maximum depth of 2.4m begl was achieved, in order to assess the consistency of the insitu soils, as well as to provide an indication of the depth to bedrock where possible. DPL1 to DPL9 were advanced to refusal depth.

Table 2 below indicates the depth to which the DPL tests were undertaken. The results of the DPL test, comprising plots of blow count per 300mm advance and inferred consistency against depth are provided in Appendix B.

**Table 2**  
**Summary of DPL Test Results**

DPL No.	GPS Coordinates (WGS84)		Depth (mbegl)	Comments
	19 Y	X		
DPL1	0017838	3747151	0.90	Loose to 0.3m, medium dense to 0.9m. Refusal
DPL2	0017820	3747308	0.60	Dense to 0.3m, very stiff to 0.6m. Refusal
DPL3	0017704	3747564	0.60	Dense to 0.3m, very stiff to 0.6m. Refusal
DPL4	0017562	3747659	2.10	Dense to 0.3m, stiff to 0.6m, firm to 1.2m, stiff to 2.1m. Refusal
DPL5	0017329	3747440	0.30	Dense to 0.3m. Refusal
DPL6	0017458	3747085	0.60	Very dense to 0.3m. Refusal
DPL7	0017635	3747169	1.20	Medium dense to 1.3m, dense to 0.9m, very dense to 1.2m. Refusal
DPL8	0017493	3747455	2.40	Dense to 0.3m, firm to 1.2m, stiff to 1.5m, dense to 1.8, very stiff to 2.1, stiff to 2.4. Refusal
DPL9	0017283	3747239	1.50	Dense to 0.3m, stiff to 0.6m, firm to 0.9m, stiff to 1.5m. Refusal

## 5. REGIONAL GEOLOGY

The regional geology of the area is shown in the extract presented in Figure 3 and taken from the 1:250 000 Cape Town 3318 geological map prepared by the Council for Geosciences.

The regional geology consists of;

- Loam and Sandy Loam, Quaternary, overlying
- Greywacke, phyllite and quartzitic sandstone with interbedded lava and tuff of the Tygerberg Formation, Malmesbury Group.
- Granite Plutons comprising mainly coarse grained porphyritic with porphyritic biotite, fine grained leucocratic, hybridic and medium grained tourmaline-bearing variants outcrop towards the east of the site.

### 5.1 Site Geology

The site is underlain by a mantle of colluvial soils overlying the weathered shales of the Tygerberg Formation of the Malmesbury Group which is the older of the formations mentioned.

The site is overlain, **in the north** by a soil mantle comprising, from ground surface, cream brown loose to dense to very dense fine grained calcareous SAND or SAND with plant roots over the top 0.4m to 0.7m, overlying;

- Cream to grey brown medium dense to dense weakly cemented to cemented CALCRETE overlying;
- Grey brown to olive brown stiff to very stiff slightly shattered sandy CLAY, overlying;
- Light grey highly to medium weathered widely jointed medium hard to hard rock SANDSTONE. The sandstone was not exposed in any of the other trial holes.

In the south, at trial pit TP4 the clay was underlain by olive brown medium dense to dense intact fine to medium grained SAND which was interpreted as being residual sandstone.

In the east, at trial pit TP5 the site is overlain by light grey dense intact SAND with tree roots over the top 0.40m overlying;

- Light grey firm shattered sandy CLAY overlying
- Olive brown to grey brown to light grey to dark grey dense to very dense gravelly SAND.

At Trial Pits TP6, TP8 and TP9 the site is underlain by dense to very dense SAND with tree roots overlying;

- Light cream grey to light olive brown stiff to very stiff intact CLAY. Trial Pit TP8 had a narrow 0.20m layer of medium grained gravelly SAND within the clay profile.

## 6. GROUNDWATER

Groundwater was not encountered in any of the trial pits, however, water ingress into excavations may be expected if the construction takes place during the normally wet winter months and after heavy rainfall.

## 7. LABORATORY TESTING

### 7.1 Materials Usage

In order to classify materials and to assess their suitability for a cemetery development the following laboratory testing was conducted on soils taken from the trial pits.

- Foundation Indicator Tests to determine Atterberg Limits, Particle Size Distribution and clay activity.
- Permeability Tests to determine soil permeability.
- In-Situ Permeability tests to determine in-situ soil permeability.

The results of the laboratory and in-situ tests are provided in Appendix C and summarised in Table 3 and 4 below.

**Table 3**  
**Summary of Results of Particle Size Distribution Analysis and Atterberg Limit Determinations**

TP No.	Depth (m)	Description	Particle Size %				Atterberg Limits			GM	Classification
			Clay	Silt	Sand	Gravel	LL	PI	LS %		
TP1	0.30-0.50	Dry light brown to cream brown loose intact fine grained calcareous SAND. Colluvium	5	6	88	1	0	NP	0	1.11	A-3(0); SW; Low heave; Type B Gravel Wearing Course
	1.60-1.90	Slightly moist olive brown stiff to very stiff slightly shattered sandy CLAY	31	3	61	4	23	11	6.0	0.89	A-2-6(0); SL; Medium heave; Type D Gravel Wearing Course
TP4	0.60-2.40	Slightly moist grey brown firm to stiff slightly shattered sandy CLAY	40	30	30	0	28	14	7.0	0.37	A-2-6(7); SL; High heave; Type D Gravel Wearing Course

LL - Liquid Limit  
 PI - Plasticity Index  
 LS - Linear Shrinkage

GM - Grading Modulus

Classification in Terms of:

USPRA<sup>2</sup>  
 Unified Soil Classification System<sup>3</sup>  
 D.H. Van Der Merwe (1964)<sup>4</sup>  
 TRH14 (1985)<sup>5</sup>  
 TRH20 (1990), Suitability for gravel wearing course<sup>6</sup>  
 Type A Erodible materials  
 Type B Ravels & corrugates  
 Type C Ravels  
 Type D Slippery when wet  
 Type E Good but may be dusty

<sup>1</sup> JS Public Roads Administration Classification (Modified from Allen 1945)

<sup>2</sup> ASTM D 2487-06 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System), June 2006

<sup>3</sup> D.H. Van Der Merwe (1964). The Prediction of Heave from the Plasticity Index and Percentage Clay Fraction of Soils. The Civil Engineer, pp 103-107

<sup>4</sup> TRH 14 (1985) - Guidelines for Road Construction Materials; Technical Recommendations for Highways, South African National Institute for Transport and Road Research

<sup>5</sup> TRH 20 (1990) - The Structural Design, Construction and Maintenance of Unpaved Roads, Committee of State Road Authorities

**Table 4**  
**Summary of Results of Permeability Testing**

TP No.	Depth (m)	Description	Test Type	Permeability k(cm/s)	Result <sup>7</sup>
TP1	0.00-0.70	Dry light brown to cream brown loose intact fine grained calcareous SAND. Colluvium	In-situ Permeability	2.18E-01	Porous
	0.70-0.90	Dry cream to grey brown medium dense to dense weakly cemented to cemented CALCRETE. Pedogenic	Falling Head Permeability*	1.76E-07	Impervious
	1.60-1.90	Slightly moist olive brown stiff to very stiff slightly shattered sandy CLAY. Colluvium	Falling Head Permeability*	2.37E-06	Impervious
TP4	0.70-0.80	Slightly moist grey brown firm to stiff slightly shattered sandy CLAY. Colluvium	In-situ Permeability	4.42E-03	Semi pervious
TP7	0.20-0.40	Dry light grey to cream grey medium dense to dense intact fine to medium grained SAND. Colluvium	In-situ Permeability	2.15E-01	Porous
TP8	0.57-	Slightly moist dark grey brown firm to stiff slightly shattered CLAY. Colluvium	In-situ Permeability	9.29E-03	Semi pervious

\*Note: Test carried out on material compacted to 95% MDD

<sup>7</sup> Williams 1993 in Steptelberg FDJ 2005, The Engineering Geology of Cape Town and Environs, Western Cape South Africa.

## 7.2 Permeability Evaluation

The materials underlying the site have been classified in terms of their permeability characteristics. The results are shown in Table 4 above.

The calcrete and sandy clay found in the soil profiles at trial Pits TP1 are found to be impervious while the clay tested in TP4 and TP8 is found to be semi pervious. The calcareous sand found at surface in Trial Pit TP1 is porous as expected. The fine to medium grained sand at 0.20m in TP7 is also porous.

## 8. DEPARTMENT OF WATER AFFAIRS AND FORESTRY (DWAF) REQUIREMENTS

The DWAF requirements with regards to the siting of cemeteries are that the following areas<sup>8</sup> should be avoided:

### 8.1 Below the 1 in 50 year flood line of a river

If the very small drainage line on the west side of the site and the extreme edge of the site on the east side where it is in close proximity to the Plankenburgrivier are avoided this requirement will be met.

### 8.2 In close proximity to water bodies such as wetlands, vleis, pans and floodplains

While there are small areas which could become vleis in wet years, notably in the north-west where a 140m furrow channels water from the neighbouring farmland in the north onto the site, (Plates 3 and 4), the bulk of the proposed area will comply if the area bounded by the drainage line in the west is avoided.

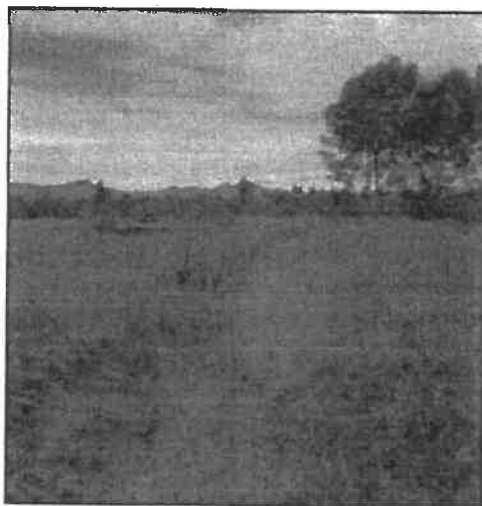


Plate 4: View towards the north along furrow



Plate 5: View towards the south along furrow

### 8.3 Situated in unstable areas

As there are no fault zones, seismic zones, dolomite or cast areas on the site, sinkholes and ground subsidence related to unstable geological conditions are unlikely

### 8.4 Sensitive ecological areas

The area is a eucalyptus plantation which was harvested in the past and has regrown. The regrowth is now interspersed with Port Jackson Willow. There is this no ecological impact on the site by the proposed cemetery in this regard.

<sup>8</sup> National Water Act No 36 of 1998. Sections 22(3) and 22(4).

### 8.5 Areas with flat gradients with shallow or emergent groundwater

The site slopes gently to the south west (approximately at 3.9%) and south east (approximately at 6%) with a spur of higher ground trending in a north - south direction between the two slopes. No groundwater was intersected in any of the trial pits (Figure 4).

### 8.6 Areas characterised by steep gradients or shallow bedrock with little soil cover

As mentioned, the site slopes gently to the south west and south east at approximately 3.9% and 6% respectively (Figure 4). Bedrock was intersected in Trial Pit TP1 only, at 2.20m begl. This area will be avoided as it falls fairly close to the small drainage line in the west. Trial pit TP7 refused on ferricrete at a depth of 2.20m having intersected the ferricrete from a depth of 1.50m. All the other trial pits were terminated at between 2.8m and 3.40mbgl without exposing any rock.

The Stellenbosch Municipality Bye-Laws pertaining to Burial Parks and Cemeteries<sup>9</sup> defines a grave as being 1.80m deep. Bye-Law 2.9(a) states that after a coffin is covered it rests at least 1.00m below the ground surface. This implies that the grave depth should not be shallower than 1.80m from surface. This criteria is met over the area proposed for the cemetery (Figure 4).

### 8.7 Areas of groundwater recharge on account of topography and/or highly permeable soils

Impervious and semi pervious calcrete and clay layers in the upper soil profile will limit the groundwater recharge capability. These conditions may lead to a shallow perched water table in the normally wet winter months or periods of high rainfall.

### 8.8 Areas overlaying or adjacent to important aquifers where these are to be used for water supply purposes

The area is classified as a Minor Aquifer<sup>10</sup> and as a result complies.

## 9. BOREHOLES AND DOMESTIC WATER SOURCES

There are no boreholes on the site. The position of the boreholes on the neighbouring farms are shown in Figure 2. Table 5 summarises the details

**Table 5**  
**Summary of Borehole Details**

TP No.	GPS Coordinates (WGS84)		Depth (mbegl)	Distance from cemetery site	Yield (litres/hr)	Comments
	19 Y	X				
BH1	0018102	3747633	40.0m	350	4000	Water quality poor. Brak. Unfit for domestic consumption
BH2	0018053	3747731	40.0m	340	3000	Water quality poor. Brak. Unfit for domestic consumption
BH3	0018149	3747800	40.0m	450	4000	Water quality poor. Brak. Unfit for domestic consumption
BH4	0018088	3747706	40.0m	350	4000	Water quality poor. Brak. Unfit for domestic consumption
BH5*	0018044	3748365	40m-50m	650	3000 to 4000	Water quality poor. Brak. Unfit for domestic consumption
BH6*	00178858	3748519	40m-50m	670	3000 to 4000	Water quality poor. Brak. Unfit for domestic consumption
BH7*	0017990	3748451	40m-50m	660	3000 to 4000	Water quality poor. Brak. Unfit for domestic consumption

\* Estimated positions and information

<sup>9</sup> Stellenbosch Municipality, Burial Parks / Cemeteries By -Laws 2007

<sup>10</sup> Aquifer Classification of South Africa. Department of Water Affairs 2012

The borehole information was obtained by personal communication from Mr Arambo Baschiera, the land owner on which boreholes BH1 to BH4 are located. Borehole depths are approximately 40m below ground level. The water quality is poor and is therefore not suitable for domestic consumption or the irrigation of agricultural crops with the exception of grass pastures. Municipal water is supplied to the properties. All the boreholes are further than 300m from the site (Table 5). The area proposed for the cemetery has impervious and semi-pervious clay in the profile and leachate migration will therefore be limited.

## 10. DEVELOPMENT RECOMMENDATIONS

### 10.1 Proposed Cemetery

The proposed cemetery will comprise a memorial park with cemetery areas, remembrance wall and park areas with trees and grass.

### 10.2 Grave Excavations

As a general observation the insitu materials to a maximum depth of between 2.80m and 3.4m below existing ground level, as determined by trial pit excavations and DPL tests, will classify as Soft Excavation (SABS1200 DM). The area at trial pits TP1 and TP7 will classify as Hard Excavation in the sandstone and ferricrete below a level of 2.00m and 2.20m respectively, below ground level. The area around these trial pits has however been excluded from the proposed site because of the drainage line in the west and hard rock ferricrete in the profile with regards TP7 (Figure 4).

Sidewall collapse was not observed in any of the trial pits put down and it is therefore assumed that grave excavations will stay open for a reasonable length of time. It must be noted that when the soils are wet by precipitation or otherwise, sidewall collapse is possible. Provided the grave excavation is stable when formed and no groundwater is present, the stand-up time for the sidewalls should be taken as maximum 24 hours, however this would need to be monitored over this period by the grave diggers in the event that rainfall could saturate the soils and cause collapse.

### 10.3 Leachate Migration

The western part of the site, from trial holes TP1 to TP4 and TP7 will not be included in the proposed cemetery site because of the proximity to the small drainage line in the west and the ferricrete in the profile in TP7 (Figure 4).

Trial pit TP4 indicates a clay layer down to 2.40m below ground level and then sand to 3.00m. Therefore, if the grave depth is deeper than 2.40m leachate will migrate in the sand. Trial Pit TP5, indicates gravelly sand down to 2.80m. Leachate migration may therefore be problematic as it could flow downslope in the sand and find its way into the Plankenburgrivier which flows towards the south through Stellenbosch joining the Eersterivier on the southern side of the town. TP6, TP8 and TP9 Indicate clay in the profile which would limit the leachate migration.

The area suitable for the proposed cemetery site would therefore be limited to approximately the east side of a line joining TP4 and TP7 and excluding the area around TP5. This approximate area is shown in the shaded area in Figure 4.

### 10.4 Basal Buffer Zone

No water was intersected in any of the trial pits put down. The depth to the water table is therefore unknown. The requirement that the basal buffer zone of 2.5m between grave and water table is met but it should be noted that this investigation was carried out during a severe drought and that in times of winter rain or heavy rain fall, the water table may be present at shallower depths.

### 10.5 Soil Workability

The sands in the profile will compact without difficulty on return to the grave whereas the clays will be more difficult to compact. Compaction will generally consist of the tamping of the soils backfilled in layers by use of the excavator bucket. A maximum compaction of about 90% could be expected by this method. Allowance is always made therefore for the subsidence of the grave backfill and subsequent releveling before any memorial structure of tombstone is constructed over the grave.

## 10.6 Slope

As mentioned earlier, the surface slopes over the site range from approximately 3.9% to 6.0% and are therefore suitable for cemetery construction. This slope is considered ideal for encouraging surface drainage and will facilitate stormwater runoff management.

## 11. RATING OF CEMETERY ATTRIBUTES

Since a large degree of research was conducted by several geotechnical consultants<sup>11, 12</sup> over the period 1990 to 2005 on the siting of cemeteries the rating of a cemetery site in terms of selected attributes is normally carried out and provides a useful guideline for planning.

The attributes used for cemetery rating are the following:

- Excavatability
- Grave stability
- Soil workability
- Groundwater
- Soil permeability, and
- Backfill Permeability

The above attributes are each further subdivided into graduations with rating values assigned to each. The site attributes are then scored against the rating values given in Tables 1 through Table 6 in Appendix D. A total rating score for the site is obtained and compared with the Site Suitability Rating in Table 6 below.

**Table 6**  
**Site Suitability Rating**

Rating Total Score	Site Suitability Rating
>90	Very good
75 to 90	Satisfactory
60 to 75	Poor – precautions needed
<60	Unacceptable

In terms of the ratings, the following scores are determined for the cemetery site:

Attribute	Score
Excavatability	12
Grave stability	20
Soil workability	3
Groundwater	10
Subsoil permeability	20
Backfill permeability	10
<b>Total Score</b>	<b>75</b>

Therefore, in terms of the ratings of the site attributes, the site is assessed as being marginally **satisfactory** for use as a Cemetery site. The site is therefore considered generally suitable for its intended use as a cemetery provided the recommendations in this report are adhered to.

<sup>11</sup> Hall, B. & Hanbury, R (1990) Some Geotechnical Considerations in the Selection of Cemetery Sites. IMIESA March 1990.

<sup>12</sup> Welland, A.M and Venter, J.P (1997). Guidelines for the Investigation of Cemetery Sites: Adaptation of "Minimum Requirements for Waste Disposal by Landfill" Applicable to Cemetery Site Investigations. Prepared by BKS (Pty); Report No 108/568; project reference P412680.



## 12. CONCLUSION

This report presents the results of the geotechnical investigation conducted for the proposed new cemetery at the Culcatta site in the Stellenbosch Municipal area.

The site is underlain by a soil mantle comprising, from ground surface, loose to dense sands of colluvial origin overlying sandy clay, gravelly sand, sand and clay horizons. Two of the trial pits intersected pedogenic ferricrete and calcrete layers while sandstone of the Tygerberg Formation Malmesbury Group was indicated at depth in one of the trial pits.

The DWAF and Stellenbosch Municipality By-Laws, requirements for the siting of cemeteries are met, however the anticipated porosity of the sands in the profile could lead to leachate migration into the upper Plankenburgrivier unless the cemetery is sited as proposed and shown in Figure 4. Therefore, the area recommended for the location of the cemetery limited to approximately the east side of a line joining TP4 and TP7 and excluding the area around TP5. This approximate area is shown in the shaded area in Figure 4.

The cemetery site was rated in terms of the attribute rankings and a score of 75 obtained. This indicates that in terms of the **Site Suitability Rating Index**, the site is considered **satisfactory** for development as a cemetery.

In conclusion, the information and recommendations provided in this report relates to the location of the trial holes and DPL tests put down on site. It is quite possible that variations to the ground conditions will be encountered elsewhere on the site during construction. Therefore, it is recommended that GGS be appointed to carry out periodic inspections on the earthworks and foundation excavations during construction to confirm the recommendations given in this report.

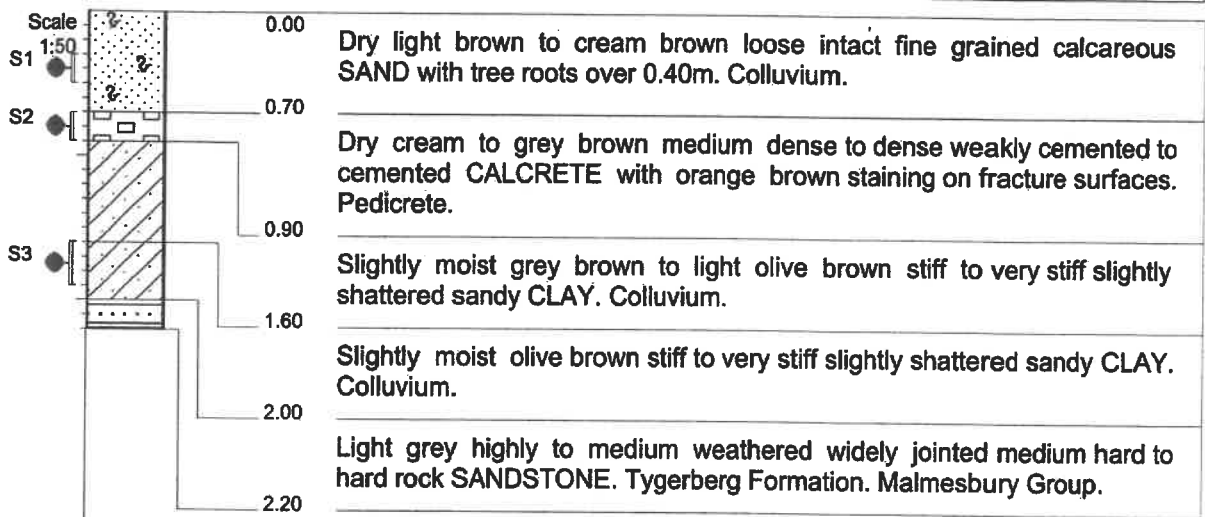
**APPENDIX A**



**CK RUMBOLL AND PARTNERS**  
**Culcatta Cemetery**

**HOLE No: TP1**  
**Sheet 1 of 1**

**JOB NUMBER: 18-811**



**NOTES**

- 1) Refusal depth at 2.20m.
- 2) No groundwater seepage.
- 3) No sidewall collapse.
- 4) Samples taken :  
 S1 0.30–0.50m  
 S2 0.70–0.90m  
 S3 1.60–1.90m



CONTRACTOR :  
 MACHINE : JCB3CX  
 DRILLED BY :  
 PROFILED BY : CLH  
 TYPE SET BY : MC  
 SETUP FILE : STANDARD.SET

INCLINATION :  
 DIAM :  
 DATE : 12/04/2018  
 DATE : 12/04/2018  
 DATE : 30/04/2018 07:52  
 TEXT : ..Cemetery\Logs\TP1TP5.doc

ELEVATION :  
 X-COORD : 3747151  
 Y-COORD : 19Y 0017838

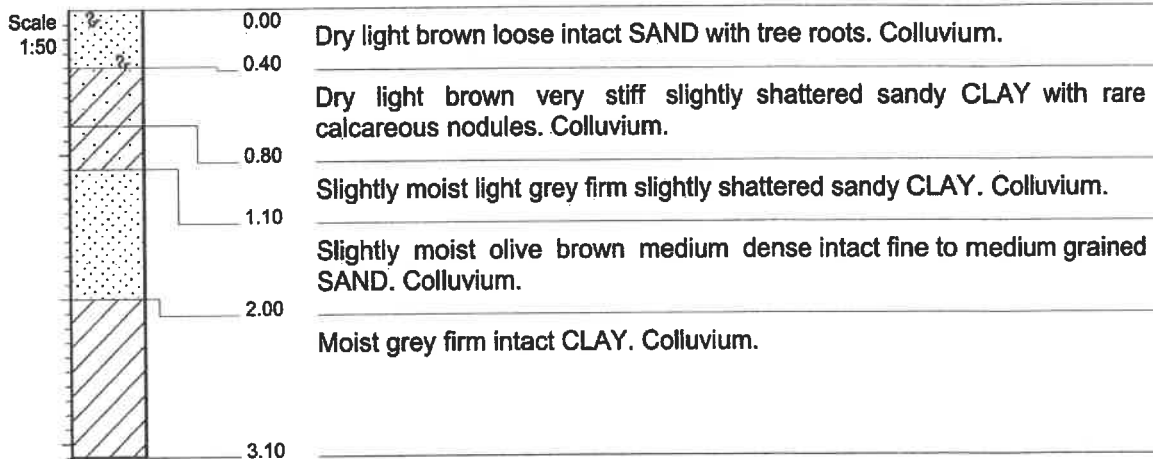
**HOLE No: TP1**



**CK RUMBOLL AND PARTNERS**  
**Culcatta Cemetery**

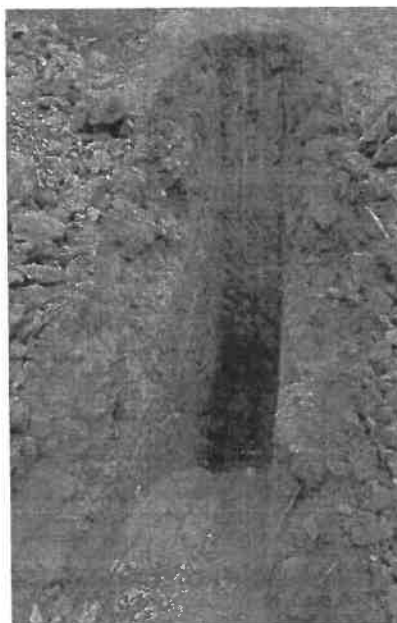
**HOLE No: TP2**  
 Sheet 1 of 1

**JOB NUMBER: 18-811**



**NOTES**

- 1) Final depth at 3.10m. TLB limit.
- 2) No groundwater seepage.
- 3) No sidewall collapse.
- 4) No samples taken.



CONTRACTOR :  
 MACHINE : JCB3CX  
 DRILLED BY :  
 PROFILED BY : CLH  
 TYPE SET BY : MC  
 SETUP FILE : STANDARD.SET

INCLINATION :  
 DIAM :  
 DATE : 12/04/2018  
 DATE : 12/04/2018  
 DATE : 30/04/2018 07:52  
 TEXT : ..Cemetery\Logs\TP1TP5.doc

ELEVATION :  
 X-COORD : 3747308  
 Y-COORD : 19Y 0017820

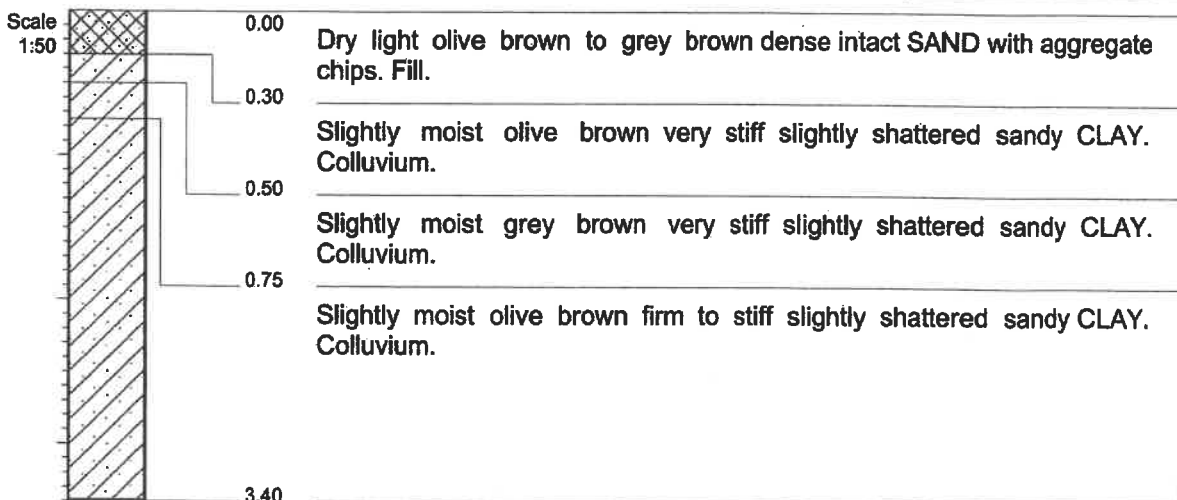
**HOLE No: TP2**



**CK RUMBOLL AND PARTNERS**  
**Culcatta Cemetery**

**HOLE No: TP3**  
**Sheet 1 of 1**

**JOB NUMBER: 18-811**



**NOTES**

- 1) Final depth at 3.40m. TLB limit.
- 2) No groundwater seepage.
- 3) No sidewall collapse.
- 4) No samples taken.

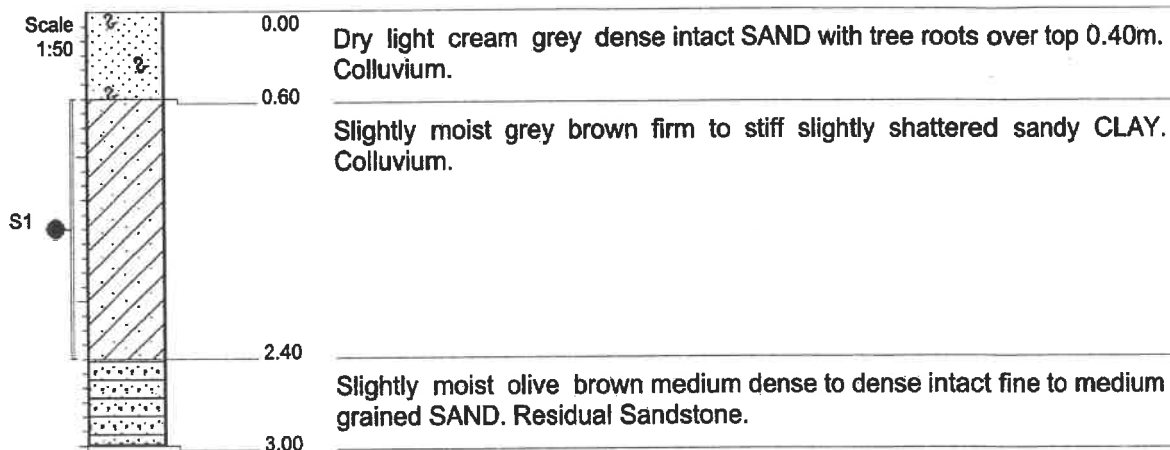


**CONTRACTOR :**  
**MACHINE : JCB3CX**  
**DRILLED BY :**  
**PROFILED BY : CLH**

**INCLINATION :**  
**DIAM :**  
**DATE : 12/04/2018**  
**DATE : 12/04/2018**  
**DATE : 30/04/2018 07:52**  
**TEXT : ..Cemetery\Logs\TP1TP5.doc**

**ELEVATION :**  
**X-COORD : 3747564**  
**Y-COORD : 19Y 0017704**

**HOLE No: TP3**


**NOTES**

- 1) Final depth at 3.00m. TLB limit.
- 2) No groundwater seepage.
- 3) No sidewall collapse.
- 4) Samples taken :  
S1 0.60--2.40m



CONTRACTOR :  
 MACHINE : JCB3CX  
 DRILLED BY :  
 PROFILED BY : CLH  
 TYPE SET BY : MC  
 SETUP FILE : STANDARD.SET

INCLINATION :  
 DIAM :  
 DATE : 12/04/2018  
 DATE : 12/04/2018  
 DATE : 30/04/2018 07:52  
 TEXT : ..Cemetery\Logs\TP1TP5.doc

ELEVATION :  
 X-COORD : 3747659  
 Y-COORD : 19Y 0017562

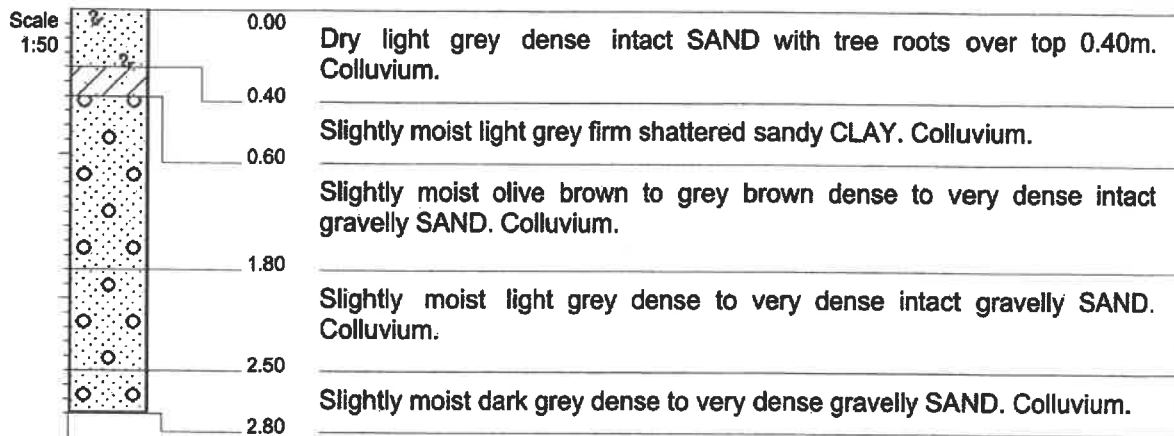
**HOLE No: TP4**



**CK RUMBOLL AND PARTNERS**  
Culcatta Cemetery

HOLE No: **TP5**  
Sheet 1 of 1

JOB NUMBER: 18-811



**NOTES**

- 1) Final depth at 2.80m. TLB limit.
- 2) No groundwater seepage.
- 3) No sidewall collapse.
- 4) No samples taken.



CONTRACTOR :  
MACHINE : JCB3CX  
DRILLED BY :  
PROFILED BY : CLH

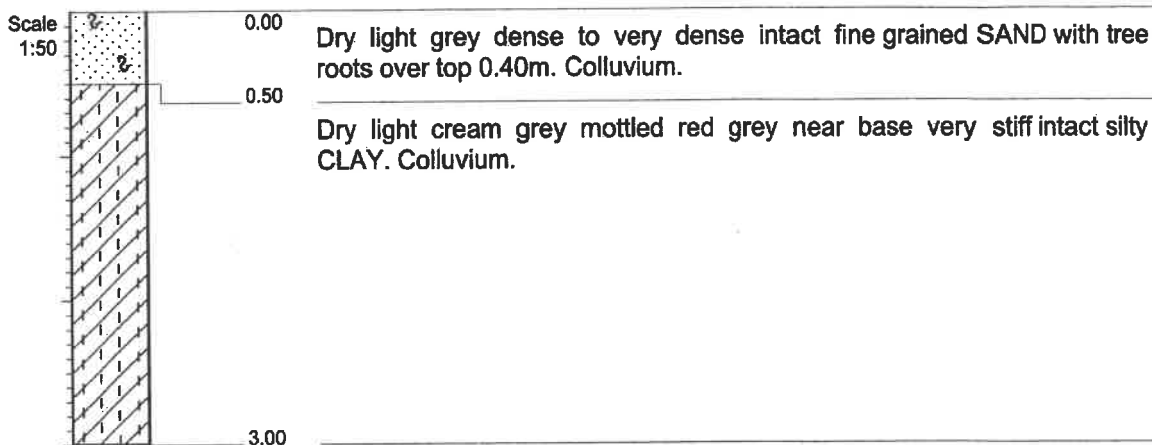
TYPE SET BY : MC  
SETUP FILE : STANDARD.SET

INCLINATION :  
DIAM :  
DATE : 12/04/2018  
DATE : 12/04/2018

DATE : 30/04/2018 07:52  
TEXT : ..Cemetery\Logs\TP1TP5.doc

ELEVATION :  
X-COORD : 3747440  
Y-COORD : 19Y 0017329

HOLE No: **TP5**


**NOTES**

- 1) Final depth at 3.00m. TLB limit.
- 2) No groundwater seepage.
- 3) No sidewall collapse.
- 4) No samples taken.



CONTRACTOR :  
 MACHINE : JCB3CX  
 DRILLED BY :  
 PROFILED BY : CLH  
 TYPE SET BY : MC  
 SETUP FILE : STANDARD.SET

INCLINATION :  
 DIAM :  
 DATE : 04/05/2018  
 DATE : 04/05/2018  
 DATE : 07/05/2018 08:36  
 TEXT : ..Cemetery\Logs\TP1TP5.doc

ELEVATION :  
 X-COORD : 3747085  
 Y-COORD : 19Y 0017458

**HOLE No: TP6**

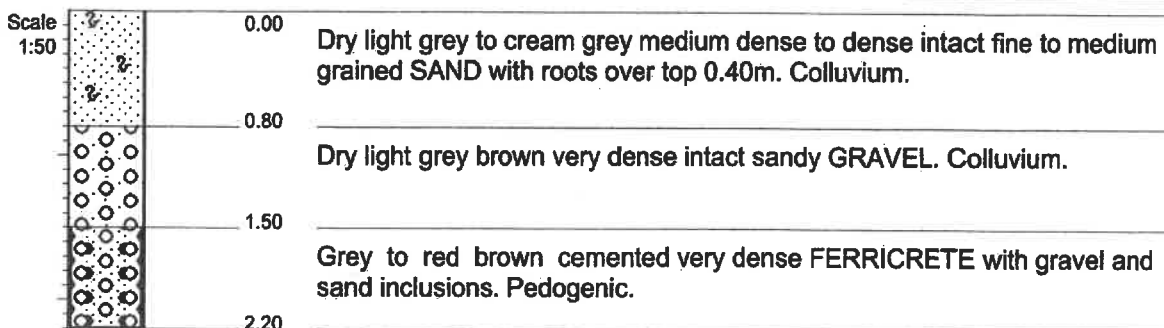




**CK RUMBOLL AND PARTNERS**  
Culcatta Cemetery

**HOLE No: TP7**  
Sheet 1 of 1

**JOB NUMBER: 18-811**



**NOTES**

- 1) Refusal depth at 2.20m.
- 2) No groundwater seepage.
- 3) No sidewall collapse.
- 4) No samples taken.

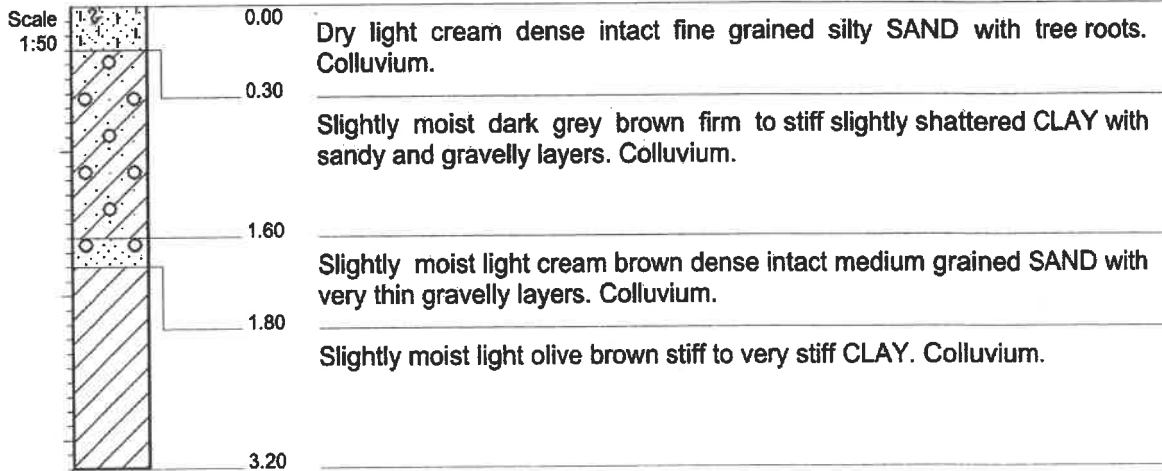


**CONTRACTOR :**  
MACHINE : JCB3CX  
DRILLED BY :  
PROFILED BY : CLH  
TYPE SET BY : MC  
SETUP FILE : STANDARD.SET

**INCLINATION :**  
DIAM :  
DATE : 04/05/2018  
DATE : 04/05/2018  
DATE : 07/05/2018 08:36  
TEXT : ..Cemetery\Logs\TP1TP5.doc

**ELEVATION :**  
X-COORD : 3747169  
Y-COORD : 19Y 0017635

**HOLE No: TP7**


**NOTES**

- 1) Final depth at 3.20m. TLB limit.
- 2) No groundwater seepage.
- 3) No sidewall collapse.
- 4) No samples taken.



CONTRACTOR :  
 MACHINE : JCB3CX  
 DRILLED BY :  
 PROFILED BY : CLH  
 TYPE SET BY : MC  
 SETUP FILE : STANDARD.SET

INCLINATION :  
 DIAM :  
 DATE : 04/05/2018  
 DATE : 04/05/2018  
 DATE : 07/05/2018 08:36  
 TEXT : ..Cemetery\Logs\TP1TP5.doc

ELEVATION :  
 X-COORD : 3747455  
 Y-COORD : 19Y 0017493

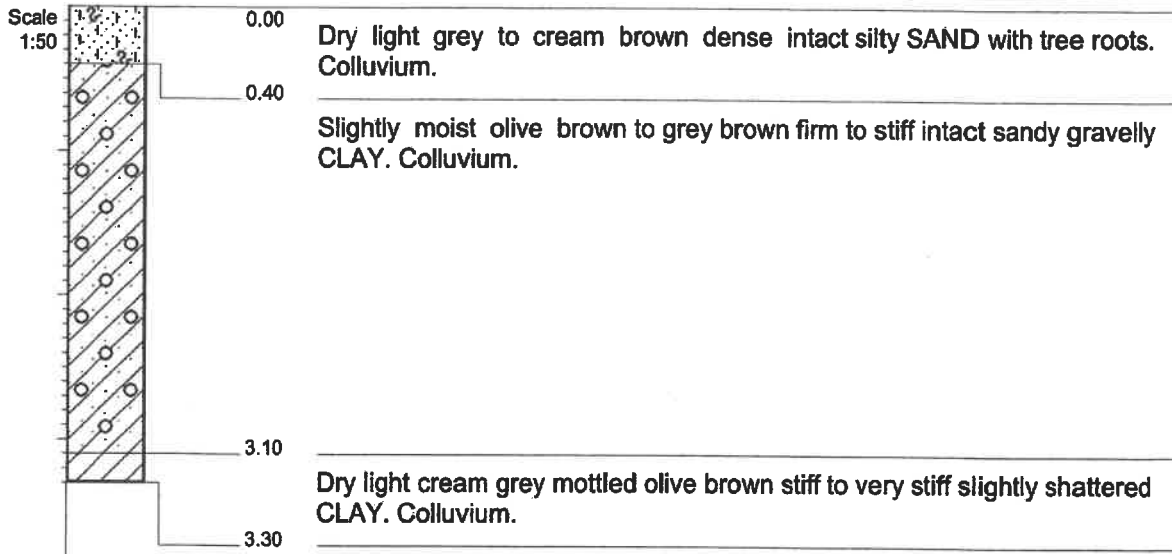
**HOLE No: TP8**



**CK RUMBOLL AND PARTNERS**  
**Culcatta Cemetery**

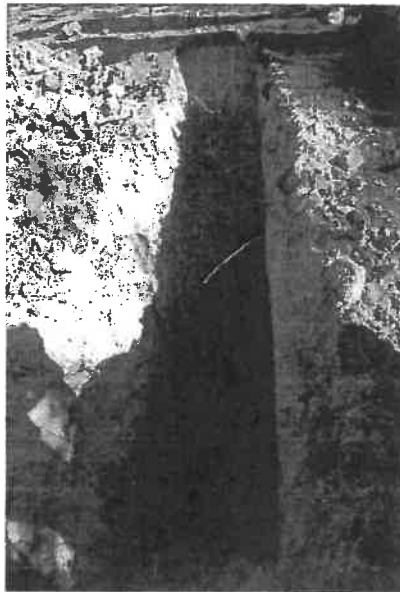
**HOLE No: TP9**  
**Sheet 1 of 1**

**JOB NUMBER: 18-811**



**NOTES**

- 1) Final depth at 3.30m. TLB limit.
- 2) No groundwater seepage.
- 3) No sidewall collapse.
- 4) No samples taken.



**CONTRACTOR :**  
**MACHINE : JCB3CX**  
**DRILLED BY :**  
**PROFILED BY : CLH**  
**TYPE SET BY : MC**  
**SETUP FILE : STANDARD.SET**

**INCLINATION :**  
**DIAM :**  
**DATE : 04/05/2018**  
**DATE : 04/05/2018**  
**DATE : 07/05/2018 08:36**  
**TEXT : ..Cemetery\Logs\TP1TP5.doc**

**ELEVATION :**  
**X-COORD : 3747239**  
**Y-COORD : 19Y 0017283**

**HOLE No: TP9**

**APPENDIX B**



Consulting Geotechnical Engineers & Engineering Geologists

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**Client:** CK RUMBOLL & PARTNERS  
**Project:** Cuttacka Cemetery  
**Section:**

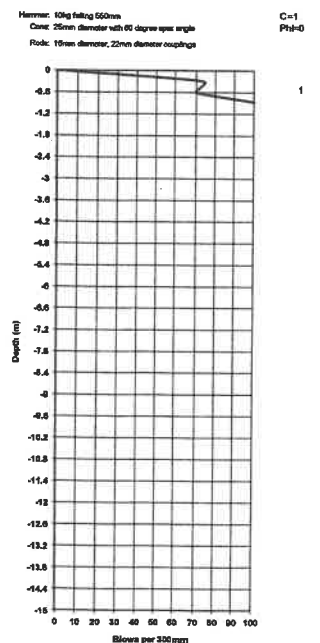
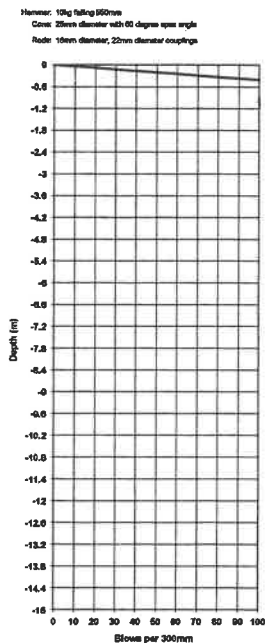
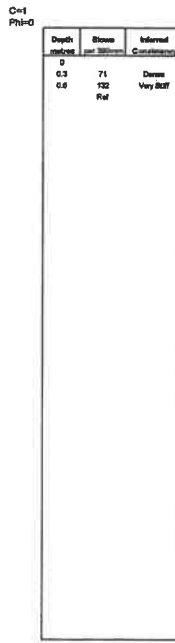
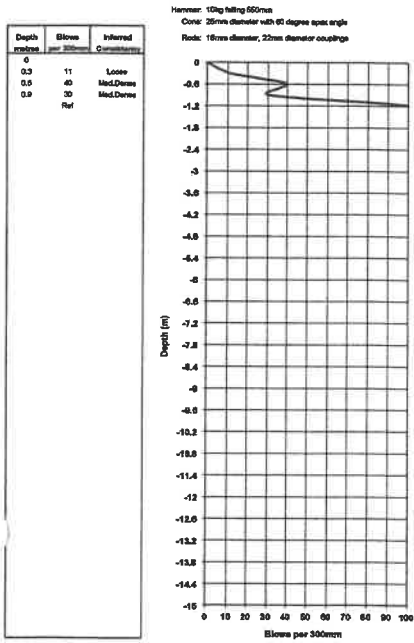
**Ref.No.:** 18-811  
**Date:** 12/04/2018  
**Operator:** CH

Light Dynamic Penetrometer Probe — Test No. DPL 1

Light Dynamic Penetrometer Probe — Test No. DPL 2

Light Dynamic Penetrometer Probe — Test No. DPL 3

THE INSITU STRENGTH DEPENDS ON SOIL MOISTURE CONTENT AND GRAIN STRUCTURE WHICH HAVE NOT BEEN ASSESSED AND MAY CHANGE. THE VALUES GIVEN ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION





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 Phone: +91 94490 45194  
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Client: CK RUMBOLL & PARTNERS  
 Project: Calcutta Cemetery  
 Section:

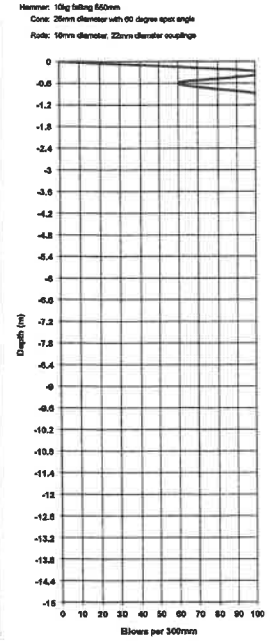
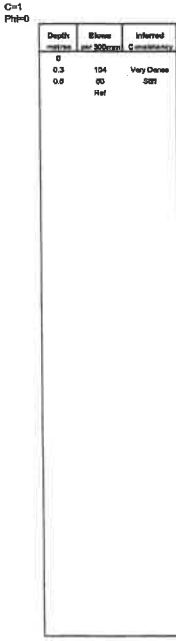
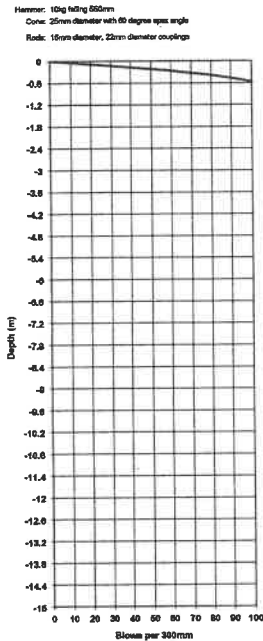
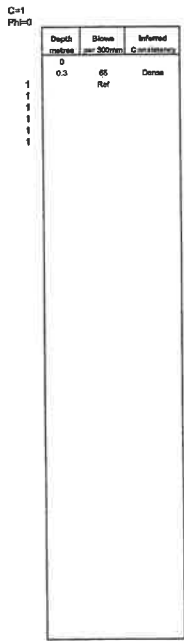
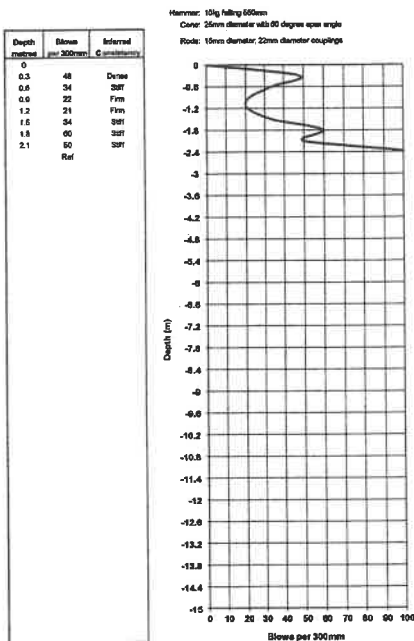
Ref.No. 18-B11  
 Date: 12/4/2018  
 Operator: CH

Light Dynamic Penetrometer Probe Test No. DPL 4

Light Dynamic Penetrometer Probe Test No. DPL 5

Light Dynamic Penetrometer Probe Test No. DPL 6

THE INSITU STRENGTH DEPENDS ON SOIL MOISTURE CONTENT AND GRAIN STRUCTURE WHICH HAVE NOT BEEN ASSESSED AND MAY CHANGE. THE VALUES GIVEN ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION



C=1  
Phi=0



Consulting Geotechnical Engineers & Engineering Geologists

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 Phone: +94 11 524 2222  
 Fax: +94 11 524 2223  
 Email: info@gondwana.lk

Client: CK RUMBOLL & PARTNERS  
 Project: Colicatta Cemetery  
 Section:

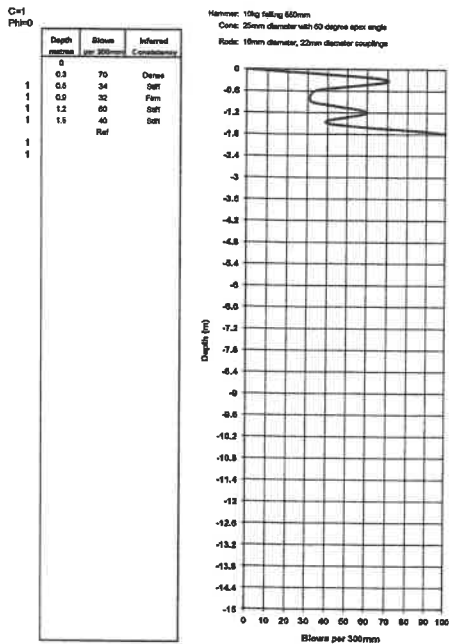
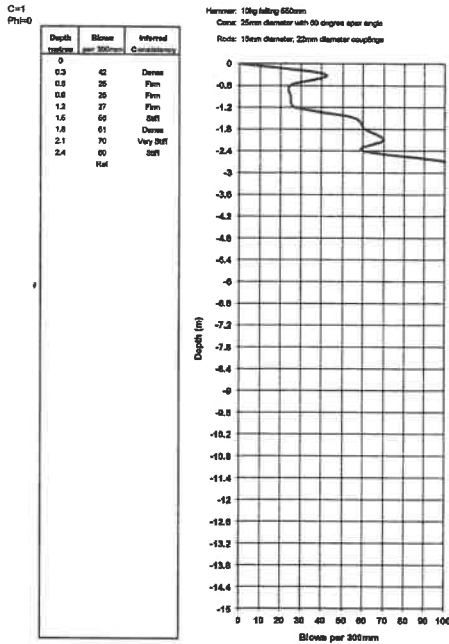
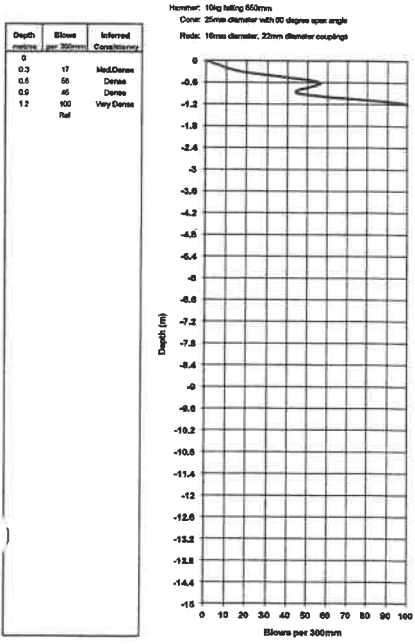
Ref.No. 18-811  
 Date: 12/02/2016  
 Operator: CH

Light Dynamic Penetrometer Probe - Test No. DPL 7

Light Dynamic Penetrometer Probe - Test No. DPL 8

Light Dynamic Penetrometer Probe - Test No. DPL 9

THE INSITU STRENGTH DEPENDS ON SOIL MOISTURE CONTENT AND GRAN STRUCTURE WHICH HAVE NOT BEEN ASSESSED AND MAY CHANGE. THE VALUES GIVEN ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION



**APPENDIX C**



# GEO SCIENCE

LABORATORIES (PTY) LTD

**CLIENT:** Gondwana Geo Solutions  
108 Upper Kenridge Avenue  
Durbanville  
7550

**PROJECT:** Culcatta Cemetry

**ATT:** Colin Hatrley

**DATE:** 20-04-2018  
**REF:** L180428

## ASTM D422 SIEVE ANALYSIS

**DESCRIPTION:** light brown calcareous sand  
**POSITION:** TP 01 @ 0.30-0.50m

**SAMPLE NO.:** 30322  
**CLIENT SAMPLE NO.:**

Sieve Analysis	Percent Passing
75,00	
63,00	
53,00	
37,50	
26,50	
19,00	100
13,20	99
9,50	99
6,70	99
4,75	99
2,36	99
2,00	99
1,18	98
0,600	93
0,425	79
0,300	52
0,150	21
0,0750	11

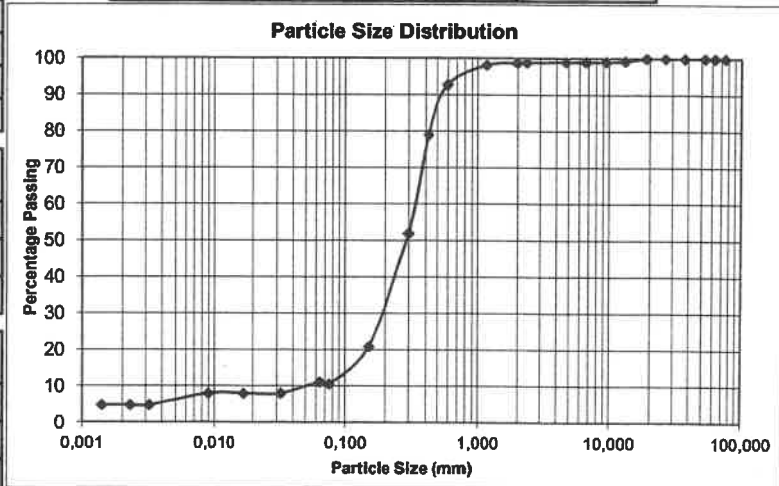
Hydrometer Analysis	
Diameter of particle (mm)	Percentage of soil suspension (%)
0,0760	11
0,0384	8
0,0192	8
0,0099	8
0,0035	5
0,0024	5
0,0014	5

SCS Dispersion Test	
Diameter of particle (mm)	Percentage of soil suspension (%)

<b>% SCS Dispersion:</b>	
<b>Initial Moisture Content (%):</b>	
<b>pH:</b>	
<b>Conductivity mS/m:</b>	

Atterberg Limits :	
Liquid Limit	
Plastic Index	N-P
Linear Shrinkage	

MOD AASHTO ; C.B.R. :	
MOD AASHTO (Kg/m³)	
O.M.C. (%)	
C.B.R. @ 100% Comp.	
C.B.R. @ 98 % Comp.	
C.B.R. @ 95 % Comp.	
C.B.R. @ 93 % Comp.	
C.B.R. @ 90 % Comp.	
Swell (max) %	



Tabulated Summary	Percentage
Gravel : Percentage - 4.75 mm	1
Sand : Percentage - 4.75mm and + 0.075mm	88
Silt : Percentage - 0.075mm and + 0.002mm	6
Clay : Percentage - 0.002mm	5

The above test results are pertinent to the samples received and tested only. While the tests are carried out according to recognized standards Geoscience shall not be liable for erroneous testing or reporting thereof. This report may not be reproduced except in full without prior consent of Geoscience.

Remarks:

For Geoscience:



## LABORATORY TEST RESULTS

CLIENT : Gondwana Geo Solutions  
PROJECT NAME : Culcatta Cemetery

admin only  
JOB NO: L180428  
SAMPLE NO: 30323

### COMPACTION MOULD PERMEAMETER

POSITION : TP 01 @ 0,720-0,90m  
SOIL DESCRIPTION : grey brown cemented calcrete  
PERMEANT USED : TAP WATER

SAMPLE DATA		
Standard Proctor	kg/m <sup>3</sup>	2028
OMC	%	9,60
Percent of Proctor specified	%	95,00
Dry density of soil required	kg/m <sup>3</sup>	1926,60
Moisture content of sample	%	9,60
Length of sample	mm	125,00
Diameter of sample	mm	150,00
Area of sample	mm <sup>2</sup>	17671,46
Volume of sample	mm <sup>3</sup>	2208932,33
Mass of dry soil required	g	4255,73
Mass of wet soil required	g	4664,28

ACTUAL DATA		
Mould Number		P1
Mass of Mould	g	4399
Mass of Mould and wet soil	g	9063,28
Mass of wet soil	g	4664,28
moisture content	%	9,60
Bulk Density	kg/m <sup>3</sup>	2111,55
Dry Density	kg/m <sup>3</sup>	1926,60
Percentage Proctor	%	95,00

Standpipe dia	mm	3,75
Standpipe area	mm <sup>2</sup>	11,04

TEST READINGS							
Test	Start Test			End Test			Comments
	Height	Time		Height	Time		
	mm	min	sec	mm	min	sec	
1	2200			2150	16	6	
2	2200			2150	17	43	
3	2200			2150	17	9	
4	2200			2150	16	58	

Number of tests = 4

CALCULATIONS FOR FALLING HEAD		
Log H1/H2	Elapsed Time	COEFFICIENT OF PERMEABILITY
mm	sec	m/s
0,0100	966,00	1,86E-09
0,0100	1063,00	1,69E-09
0,0100	1029,00	1,74E-09
0,0100	1018,00	1,76E-09

AVERAGE = 1,76E-09 m/s

AVERAGE = 1,76E-07 cm/s

Notes : PROCTOR VALUE SUPPLIED

# GEO SCIENCE

LABORATORIES (PTY) LTD

**CLIENT:** Gondwana Geo Solutions  
108 Upper Kenridge Avenue  
Durbanville  
7550

**PROJECT:** Culcatta Cemetry

**DATE:** 20-04-2018

**ATT:** Colin Hatrley

**REF:** L180428

## ASTM D422 SIEVE ANALYSIS

**DESCRIPTION :** olive brown sandy clay  
**POSITION :** TP 01 @ 1.60-1.90m

**SAMPLE NO. :** 30324

**CLIENT SAMPLE NO. :**

Sieve Analysis	Percent Passing
75,00	
63,00	
53,00	
37,50	
26,50	
19,00	
13,20	100
9,50	99
6,70	98
4,75	96
2,36	93
2,00	93
1,18	91
0,600	89
0,425	84
0,300	71
0,150	43
0,0750	34

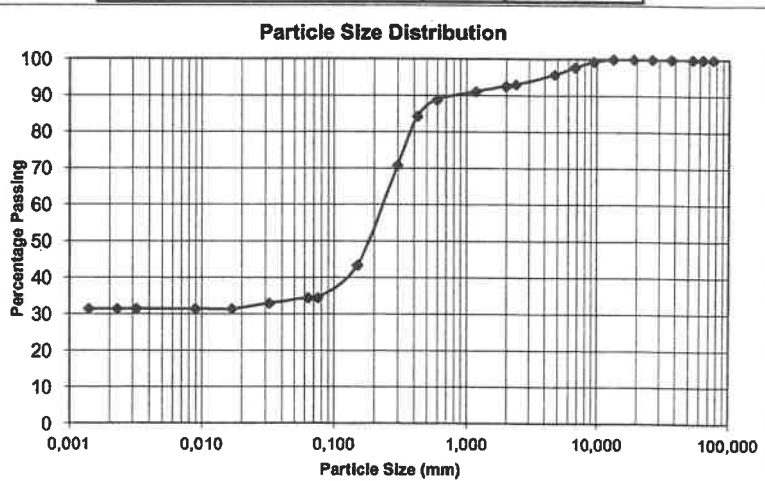
Hydrometer Analysis	
Diameter of particle (mm)	Percentage of soil suspension (%)
0,0707	34
0,0353	33
0,0179	31
0,0092	31
0,0032	31
0,0023	31
0,0013	31

SCS Dispersion Test	
Diameter of particle (mm)	Percentage of soil suspension (%)

<b>% SCS Dispersion:</b>	
<b>Initial Moisture Content (%):</b>	
<b>pH:</b>	
<b>Conductivity mS/m:</b>	

Atterberg Limits :	
Liquid Limit	23
Plastic Index	11
Linear Shrinkage	6,0

MOD AASHTO ; C.B.R. :	
MOD AASHTO (Kg/m <sup>3</sup> )	
O.M.C. (%)	
C.B.R. @ 100% Comp.	
C.B.R. @ 98 % Comp.	
C.B.R. @ 95 % Comp.	
C.B.R. @ 93 % Comp.	
C.B.R. @ 90 % Comp.	
Swell ( max ) %	



Tabulated Summary	Percentage
Gravel : Percentage - 4.75 mm	4
Sand : Percentage - 4.75mm and + 0.075mm	61
Silt : Percentage - 0.075mm and + 0.002mm	3
Clay : Percentage - 0.002mm	31

The above test results are pertinent to the samples received and tested only.

For Geoscience:

While the tests are carried out according to recognized standards Geoscience shall not

be liable for erroneous testing or reporting thereof. This report may not be reproduced except in full without prior consent of Geoscience.

Remarks:

ConSR22



## LABORATORY TEST RESULTS

CLIENT : Gondwana Geo Solutions  
PROJECT NAME : Culcatta Cemetry

admin only  
JOB NO: L180428  
SAMPLE NO: 30324

### COMPACTION MOULD PERMEAMETER

POSITION : TP 01 @ 1,60-1,90m  
SOIL DESCRIPTION : olive brown sandy clay  
PERMEANT USED : TAP WATER

SAMPLE DATA		
Standard Proctor	kg/m <sup>3</sup>	1940
OMC	%	12,60
Percent of Proctor specified	%	95,00
Dry density of soil required	kg/m <sup>3</sup>	1843,00
Moisture content of sample	%	12,60
Length of sample	mm	125,00
Diameter of sample	mm	150,00
Area of sample	mm <sup>2</sup>	17671,46
Volume of sample	mm <sup>3</sup>	2208932,33
Mass of dry soil required	g	4071,06
Mass of wet soil required	g	4584,02

ACTUAL DATA		
Mould Number		P3
Mass of Mould	g	4331
Mass of Mould and wet soil	g	8915,02
Mass of wet soil	g	4584,02
moisture content	%	12,60
Bulk Density	kg/m <sup>3</sup>	2075,22
Dry Density	kg/m <sup>3</sup>	1843,00
Percentage Proctor	%	95,00

Standpipe dia	mm	3,75
Standpipe area	mm <sup>2</sup>	11,04

TEST READINGS							
Test	Start Test			End Test			Comments
	Height	Time		Height	Time		
	mm	min	sec	mm	min	sec	
1	2200			2150	1	6	
2	2200			2150	1	21	
3	2200			2150	1	13	
4	2200			2150	1	26	

CALCULATIONS FOR FALLING HEAD		
Log H1/H2	Elapsed Time	COEFFICIENT OF PERMEABILITY
mm	sec	m/s
0,0100	66,00	2,72E-08
0,0100	81,00	2,21E-08
0,0100	73,00	2,46E-08
0,0100	86,00	2,09E-08

Number of tests = 4

AVERAGE =	2,37E-08	m/s
AVERAGE =	2,37E-06	cm/s

Notes : PROCTOR VALUE SUPPLIED

# GEO SCIENCE

LABORATORIES (PTY) LTD

**CLIENT:** Gondwana Geo Solutions  
108 Upper Kenridge Avenue  
Durbanville  
7550

**PROJECT:** Culcatta Cemetry

**DATE:** 20-04-2018

**ATT:** Colin Hatrley

**REF:** L180428

## ASTM D422 SIEVE ANALYSIS

**DESCRIPTION :** grey brown sandy clay  
**POSITION :** TP 204 @ 0.60-2.40m

**SAMPLE NO. :** 30325

**CLIENT SAMPLE NO. :**

Sieve Analysis	Percent Passing
75,00	
63,00	
53,00	
37,50	
26,50	
19,00	
13,20	
9,50	
6,70	
4,75	
2,36	
2,00	100
1,18	99
0,600	95
0,425	92
0,300	87
0,150	76
0,0750	70

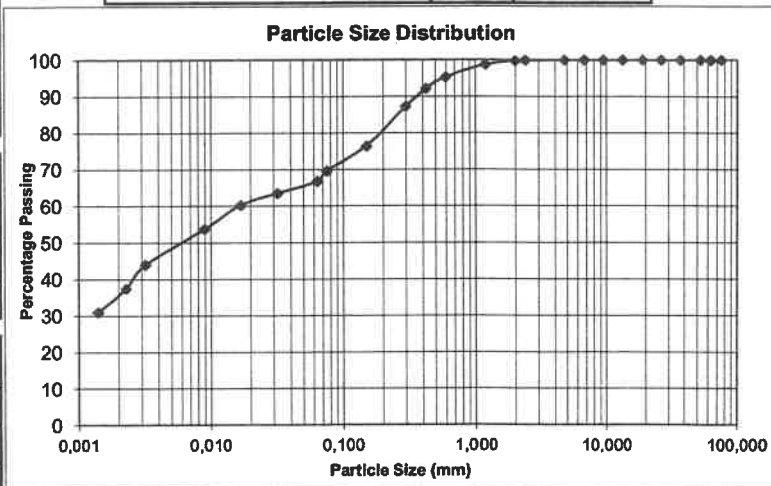
Hydrometer Analysis	
Diameter of particle (mm)	Percentage of soil suspension (%)
0,0640	67
0,0324	63
0,0164	60
0,0087	54
0,0031	44
0,0022	37
0,0013	31

SCS Dispersion Test	
Diameter of particle (mm)	Percentage of soil suspension (%)

<b>% SCS Dispersion:</b>	
<b>Initial Moisture Content (%) :</b>	
<b>pH:</b>	
<b>Conductivity mS/m:</b>	

Atterberg Limits :	
Liquid Limit	28
Plastic Index	14
Linear Shrinkage	7,0

MOD AASHTO ; C.B.R. :	
MOD AASHTO (Kg/m <sup>3</sup> )	
O.M.C. (%)	
C.B.R. @ 100% Comp.	
C.B.R. @ 98 % Comp.	
C.B.R. @ 95 % Comp.	
C.B.R. @ 93 % Comp.	
C.B.R. @ 90 % Comp.	
Swell ( max ) %	



Tabulated Summary	Percentage
Gravel : Percentage - 4.75 mm	0
Sand : Percentage - 4.75mm and + 0.075mm	30
Silt : Percentage - 0.075mm and + 0.002mm	30
Clay : Percentage - 0.002mm	40

The above test results are pertinent to the samples received and tested only. While the tests are carried out according to recognized standards Geoscience shall not be liable for erroneous testing or reporting thereof. This report may not be reproduced except in full without prior consent of Geoscience.

For Geoscience:

Remarks:

ConSR22

**APPENDIX D**

**TABLE 1  
EXCAVATABILITY RATINGS**

DESCRIPTION	ASSESSMENT	RATING
Easy Spade	Pick point to 50mm	15
Pick and Spade	Slight indentation	10
Machine	Firm blows (1-3mm)	5
Blasting	Backactor refusal	0

**TABLE 2  
STABILITY RATINGS**

DESCRIPTION	ASSESSMENT	RATING
Stable	Excavation can be profiled safely	20
Overbreak	Excavation stable: Overbreak 1.3 - 1.8 *	15
Slightly unstable	Minor falls of material	8
Unstable	Collapse of hole likely	F

Note: Overbreak = Ratio of widths top of trench to base  
F = Fatal flaw

**TABLE 3  
WORKABILITY RATINGS**

DESCRIPTION	UNIFIED CLASS	MDD (kg/m <sup>3</sup> )	RATING
Excellent / Good	GW / SW / GP	+1800	10
Fair	SP / SM	<1800	5
Poor	OL / CL / ML	<1700	2
Very poor	OH / CH / MH	>1800	0

**TABLE 4  
WATER TABLE RATINGS**

DESCRIPTION	WATER TABLE DEPTH (m) *	RATING
Deep water table	+8	25
Intermediate	4 - 8	15
Possible perched water	0 - 4	5
Water logged soil	0 - 4	F

**TABLE 5  
SUBSOIL PERMEABILITY RATINGS**

DESCRIPTION	PERCOLATION RATE (mm/hr)	APPROX. PERMEABILITY (cm/sec)	RATING
Impermeable	Not measurable	<10 <sup>-5</sup>	15
Relatively impermeable	10 - 15	10 <sup>-4</sup> to 10 <sup>-5</sup>	20
Relatively permeable	15 - 50	10 <sup>-3</sup> to 10 <sup>-4</sup>	10
Permeable	50 - 1000	>10 <sup>-3</sup>	0

**TABLE 6  
BACKFILL PERMEABILITY RATINGS**

DESCRIPTION	ASSESSMENT	RATING
Impermeable	OH / CI / CH	5
Relatively impermeable	GC / SC / MH	10
Relatively permeable	GP / SP / GW	7
Very permeable	SW / SP	0

Note: \* Measured from ground level

**FIGURES**





Graphic Scale  
1 / 50 000

N.B. - Please note that the bar scale supersedes the verbal scale due to print sizes etc.

Drawing prepared from 1 / 60 000 TOPOGRAPHICAL SERIES : 3318 DD

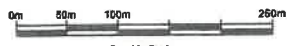
DRAWING DESCRIPTION	CLIENT	DATE
	PROJECT	CHECK
Locality Plan  Scale 1 : 50 000 (On A4 Original)	<b>CK RUMBOLL &amp; PARTNERS</b> Geotechnical Investigation for Calcutta Cemetery	
	REFERENCE No.	FIGURE No. / REV.

DATE	02/05/2017
DRAWN	A.S.
CHECK	M.V.R.
REFERENCE No.	18 - 811
FIGURE No.	1
REV.	0



**KEY :**

	Approximate position of Test Pit showing final depth or depth to refusal ( ) in metres below existing ground level.
	Approximate position of Dynamic Cone Penetrometer Test (Light) showing depth to refusal in metres below existing ground level.
	Approximate position of Borehole showing final depth in metres below existing ground level.



Graphic Scale  
1 / 5 000  
NB : Please note that the bar scale supersedes the verbal scale due to print sizes etc.

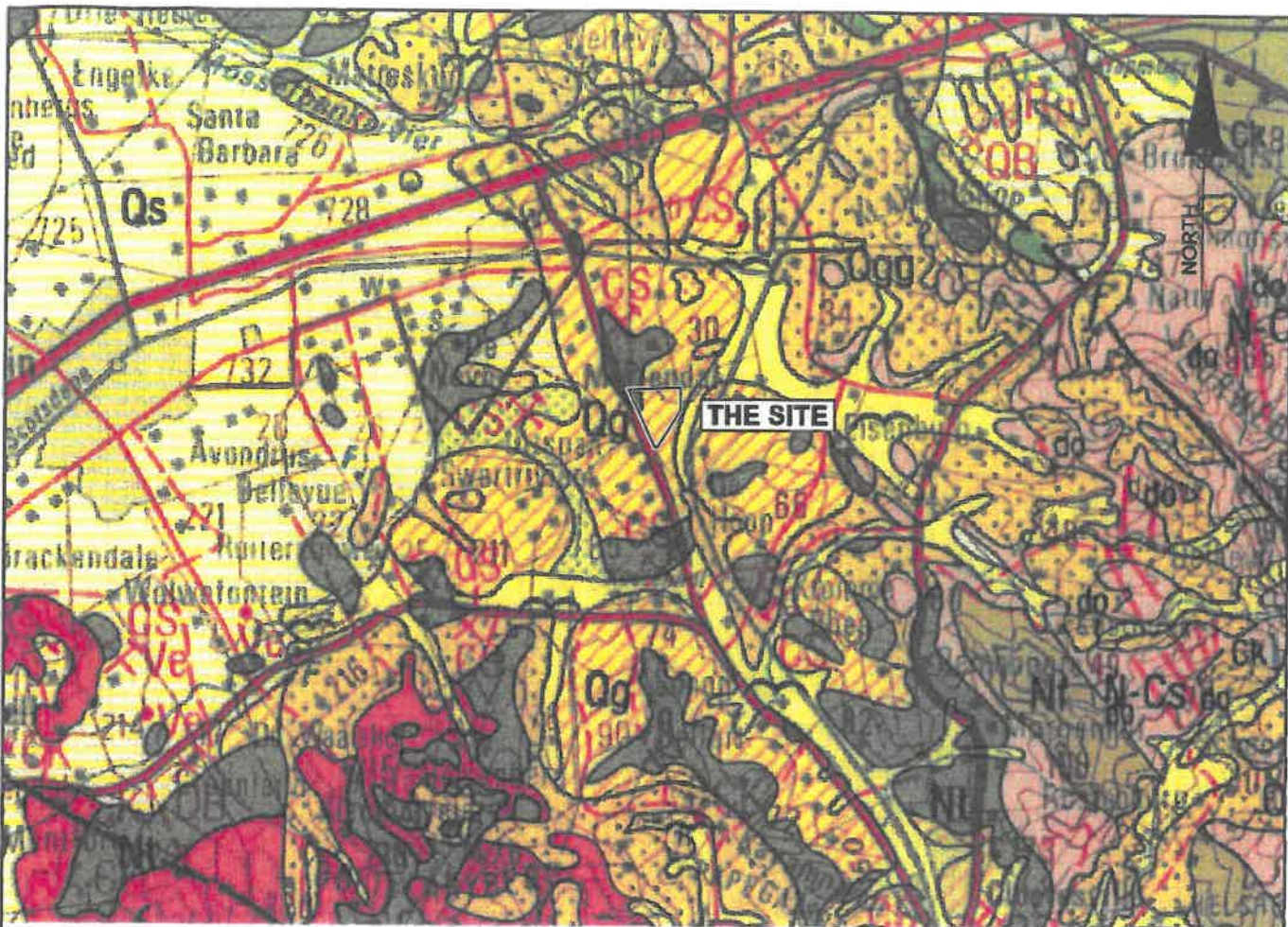
**DRAWING DESCRIPTION**  
 Site Plan showing approximate positions of :  
 a.) Test Pits.  
 b.) Dynamic Cone Penetrometer Tests (Light)  
 c.) Boreholes

**Scale 1 : 5000 (On A3 Original)**











**CLIENT**  
**CK RUMBOLL & PARTNERS**

**PROJECT**  
 Geotechnical Investigation for  
 Calcutta Cemetery

<b>DATE</b>	02/05/2018
<b>DRAWN</b>	A.S.
<b>CHECK</b>	M.V.R.
<b>REFERENCE No.</b>	18 - 811
<b>FIGURE No.</b>	2
<b>REV.</b>	0



**LEGEND**


-  **Alluvium**
-  **Terrace gravel**
-  **Qgg Gravelly clay/loam soil**
-  **Qg Loam and sandy loam**
-  **Qs Sandy soil - Springfontyn Formation**
-  **do Dolerite - Intrusive rock**
-  **Nf Feldspathic conglomerate, grit and sandstone - Franschhoek Formation. CAPE GRANITE SUITE**
-  **N-Gf Granite - porphyritic, biotitic, with tourmaline-bearing variants. CAPE GRANITE SUITE**
-  **N-Cs Granite - porphyritic with leucocratic, hybridic, biotitic variants. CAPE GRANITE SUITE**
-  **Nt Greywacke, phyllite and quartzitic sandstone - interbedded lava and tuff - Tygerberg Formation. MALMESBURY GROUP**

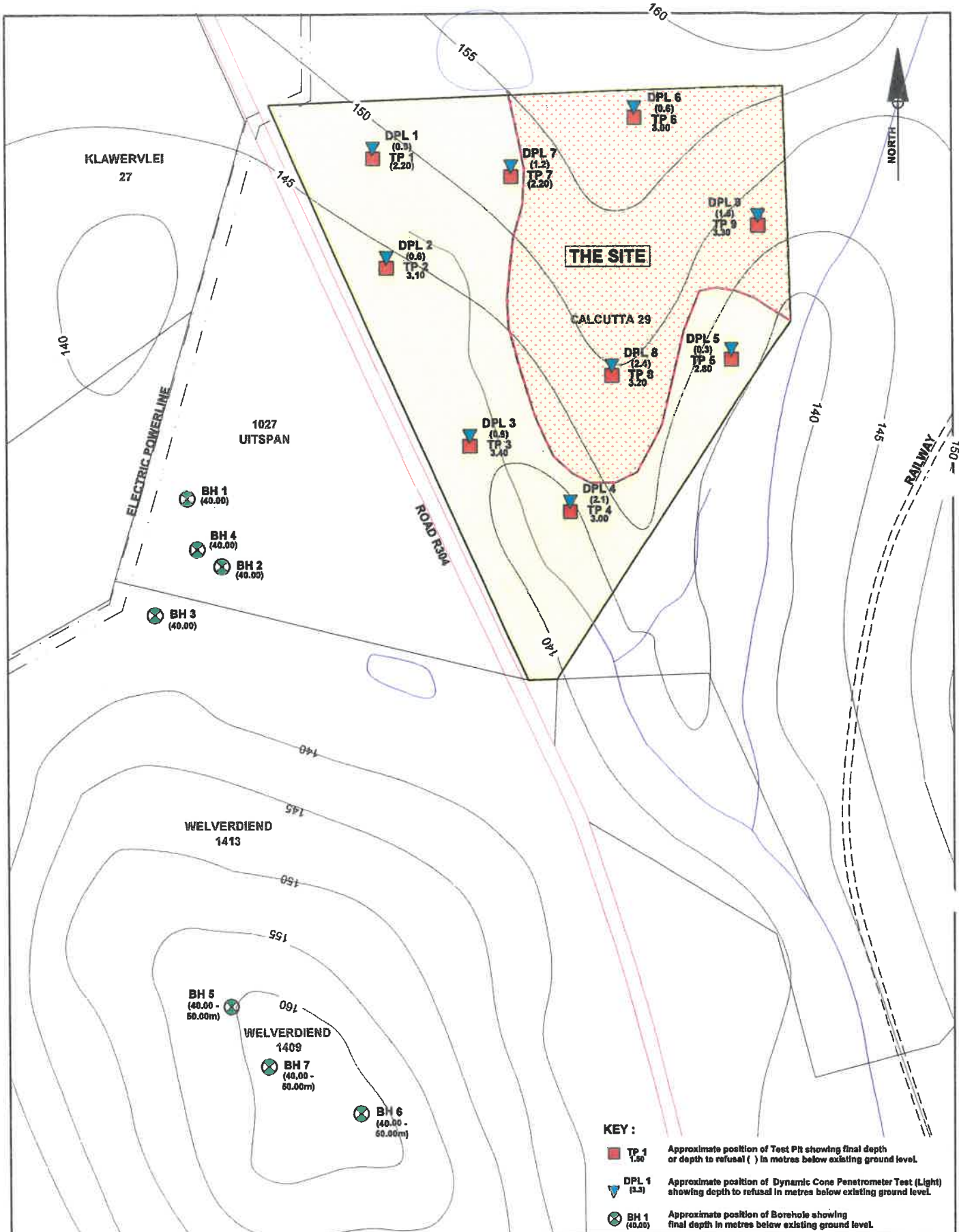


Graphic Scale  
1 / 100 000

N3: Please note that the bar scale supercedes the verbal scale due to print sizes etc.

Drawing prepared from 1 / 250 000 GEOLOGICAL SERIES : CAPE TOWN 3318

<p><b>DRAWING DESCRIPTION</b></p> <p style="text-align: center; font-weight: bold;">Locality Plan showing Regional Geology</p> <p style="font-weight: bold; margin-top: 10px;">Scale 1 : 100 000 (On A4 Original)</p>	<p><b>CLIENT</b></p> <p style="text-align: center; font-weight: bold;">CK RUMBOLL &amp; PARTNERS</p> <p><b>PROJECT</b></p> <p style="text-align: center;">Geotechnical Investigation for Calcutta Cemetery</p>	<p><b>DATE</b></p> <p style="text-align: center; font-weight: bold;">02/05/2018</p>
		<p><b>DRAWN</b></p> <p style="text-align: center; font-weight: bold;">A.S.</p> <p><b>CHECK</b></p> <p style="text-align: center; font-weight: bold;">M.V.R.</p>
<p><b>FIGURE No.</b></p> <p style="text-align: center; font-weight: bold;">3</p>		<p><b>REV.</b></p> <p style="text-align: center; font-weight: bold;">0</p>



- KEY :**
- TP 1 (1.50) Approximate position of Test Pit showing final depth or depth to refusal ( ) in metres below existing ground level.
  - ▼ DPL 1 (3.3) Approximate position of Dynamic Cone Penetrometer Test (Light) showing depth to refusal in metres below existing ground level.
  - ⊗ BH 1 (40.00) Approximate position of Borehole showing final depth in metres below existing ground level.



Graphic Scale  
1 / 5 000  
NB : Please note that the bar scale represents the vertical scale due to print sizes etc.

**DRAWING DESCRIPTION**

Site Plan showing Topography of the Site

  Proposed Cemetery Site

Scale 1 : 5000 (On A3 Original)

**CLIENT**  
CK RUMBOLL & PARTNERS

**PROJECT**  
Geotechnical Investigation for Calcutta Cemetery

**GONDWANA**  
GEO SOLUTIONS

DATE	02/05/2018
DRAWN	A.S.
CHECK	M.V.R.
REFERENCE No.	18 - 811
FIGURE No.	4
REV.	0

## PALAEOLOGICAL HERITAGE SPECIALIST STUDY: LETTER OF EXEMPTION

**Proposed Memorial Park on Farm Calcutta RE/29 near Stellenbosch, Cape Winelands District Municipality, Western Cape**

John E. Almond PhD (Cantab.)  
Natura Viva cc, PO Box 12410 Mill Street,  
Cape Town 8010, RSA  
naturaviva@universe.co.za

November 2018

**EXECUTIVE SUMMARY**

Late Caenozoic superficial deposits (sandy soils, ferricrete, stream gravels) as well as the underlying, deeply-weathered bedrocks of Malmesbury Group metasediments (possibly intruded by Cape Granite) in the Farm Calcutta RE/29 Memorial Park study area are all of low to very low palaeontological sensitivity. No fossil remains were recorded here during a short palaeontological site visit. The proposed cemetery development is very unlikely to entail significant impacts on palaeontological heritage. There are therefore no objections on palaeontological heritage grounds to authorisation of the proposed development.

**It is recommended that, pending the exposure of significant new fossils (e.g. mammalian bones and teeth) during construction, exemption from further specialist palaeontological studies and mitigation be granted for this development.**

If fossil material is discovered during construction, this should be safeguarded, preferably *in situ*, and the ECO should alert Heritage Western Cape (Contact details: Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za) so that appropriate mitigation (*i.e* recording, sampling or collection) can be taken by a professional palaeontologist. A tabulated Chance Fossil Finds Protocol is appended to this report. These recommendations should be incorporated into the Environmental Management Plan for the proposed developments.

**1. PROJECT OUTLINE**

It is proposed to establish a new Memorial Park on the farm Calcutta No. 29, situated on the eastern side of the R304 tar road some c. 8.75 km NW of Stellenbosch in the Cape Winelands District Municipality, Western Cape (Figs. 1 & 2). The proposed cemetery development footprint will occupy 30 ha of the 39,64 ha property. As part of the development of the cemetery and memorial park, it is proposed to promote the rehabilitation and conservation of the watercourse running through the property. Associated infrastructure includes one or more bridges to cross the watercourse and access the site, access roads leading to and within the site, an entrance wall and perimeter fencing, parking, a memorial wall, ablutions and a possible borehole.

A desktop Heritage Screener for the development has been submitted by CTS Heritage, Plumstead (5 March 2018). The present combined desktop and field-based palaeontological heritage comment has been commissioned by CK Rumboll & Partners, Malmesbury (Contact details: Mr Ruben Bower. CK Rumboll & Partners, PO Box 221, 16 Rainiersstraat, Malmesbury 7299. Tel: 022 482 1845. E-mail: leap@rumboll.co.za). A short palaeontological site visit was undertaken by the author on 7 November 2018 to supplement the desktop study.

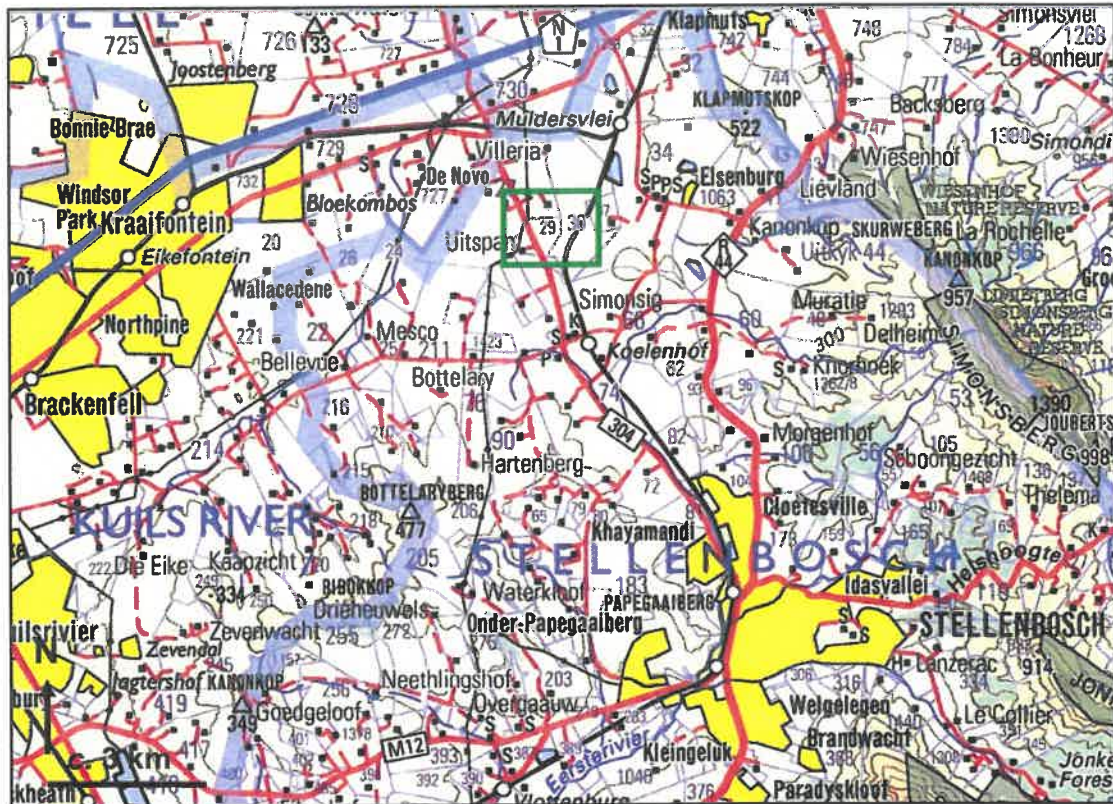


Figure 1. Extract from 1: 250 000 topographical sheet 3318 Cape Town (Courtesy of the Chief Directorate: National Geo-Spatial Information, Mowbray) showing the approximate location of the proposed Memorial Park on Farm 29 Calcutta near Stellenbosch, Western Cape (green rectangle).

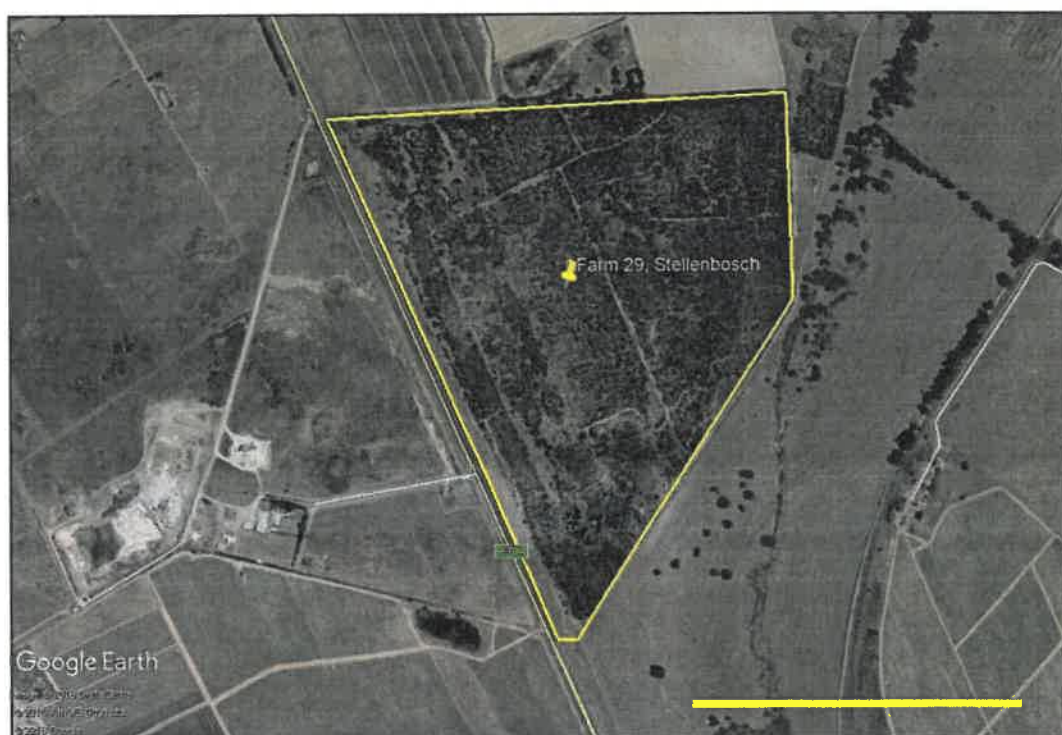


Figure 2. Google Earth© satellite image of Farm 29 Calcutta located on the eastern side of the R304 tar road c. 8.75 km NW of Stellenbosch showing the almost flat-lying terrain overgrown with eucalyptus and acacia trees with no obvious bedrock exposure. Pale bedrocks – probably clays derived from weathered Malmesbury Group metasediments – are

visible in the shallow quarry at Uitspan, some 0.5 km SW of the study site. Scale bar = 500 m.

## 2. GEOLOGICAL CONTEXT

The study site on Farm 29 Calcutta comprises flat to gently SW-sloping sandy terrain at between 150-170 m amsl that is largely overgrown by former eucalyptus plantations and alien acacias (Figs. 2 & 4). The terrain at surface is highly disturbed and bedrock exposures are apparently not present.

The geology of the study area near Stellenbosch is shown on 1: 250 000 geology sheet 3318 Cape Town (Fig. 3) (Theron *et al.* 1992). The bedrocks beneath the Memorial Park study site comprise low-grade marine metasediments of the **Malmesbury Group** of Late Precambrian (Ediacaran) age. These greywackes, quartzites and phyllites are assigned to the **Tygerberg Formation** (Nt, pale brown in Fig. 3) and were deposited in a turbidite fan depositional setting (Von Veh 1983, Rosendal *et al.* 1999, Gresse *et al.* 2006, Belcher & Kisters 2003). The Malmesbury Group country rocks to the northwest of Stellenbosch are intruded by Late Precambrian to Early Cambrian granites of the **Cape Granite Suite** – in this case the coarse-grained, porphyritic **Kuilsrivier – Helderberg Pluton** (N-Ck, orange in Fig. 3) but Cape Granite is not mapped within the study area itself. Surface exposures of the Tygerberg Formation metasediments are not apparent on satellite images of the study area itself (Fig. 2), and were not encountered during the site visit. Pale bedrocks visible in the shallow quarry at Uitspan, some 0.5 km SW of the study site, are probably clays derived from deeply-weathered Malmesbury Group metasediments.

The Precambrian basement rocks are mantled with a range of Late Cenozoic (probably Quaternary for the most part) superficial sediments including gravelly alluvium (with an admixture of building rubble) along shallow water courses, **sparsely gravelly, loamy and sandy soils** (Qg in Fig. 3) (Figs. 5, 7 & 8) as well as a locally by well-developed **ferricrete hardpan** (Fig. 6). The ferricrete hardpan has probably developed above a thick profile of deeply-weathered Malmesbury Group (and perhaps also granite) bedrocks. Test excavations outlined in the geotechnical report also encountered stiff clay (weathered Malmesbury or granite saprolite), sandstone, calcrete and sand.

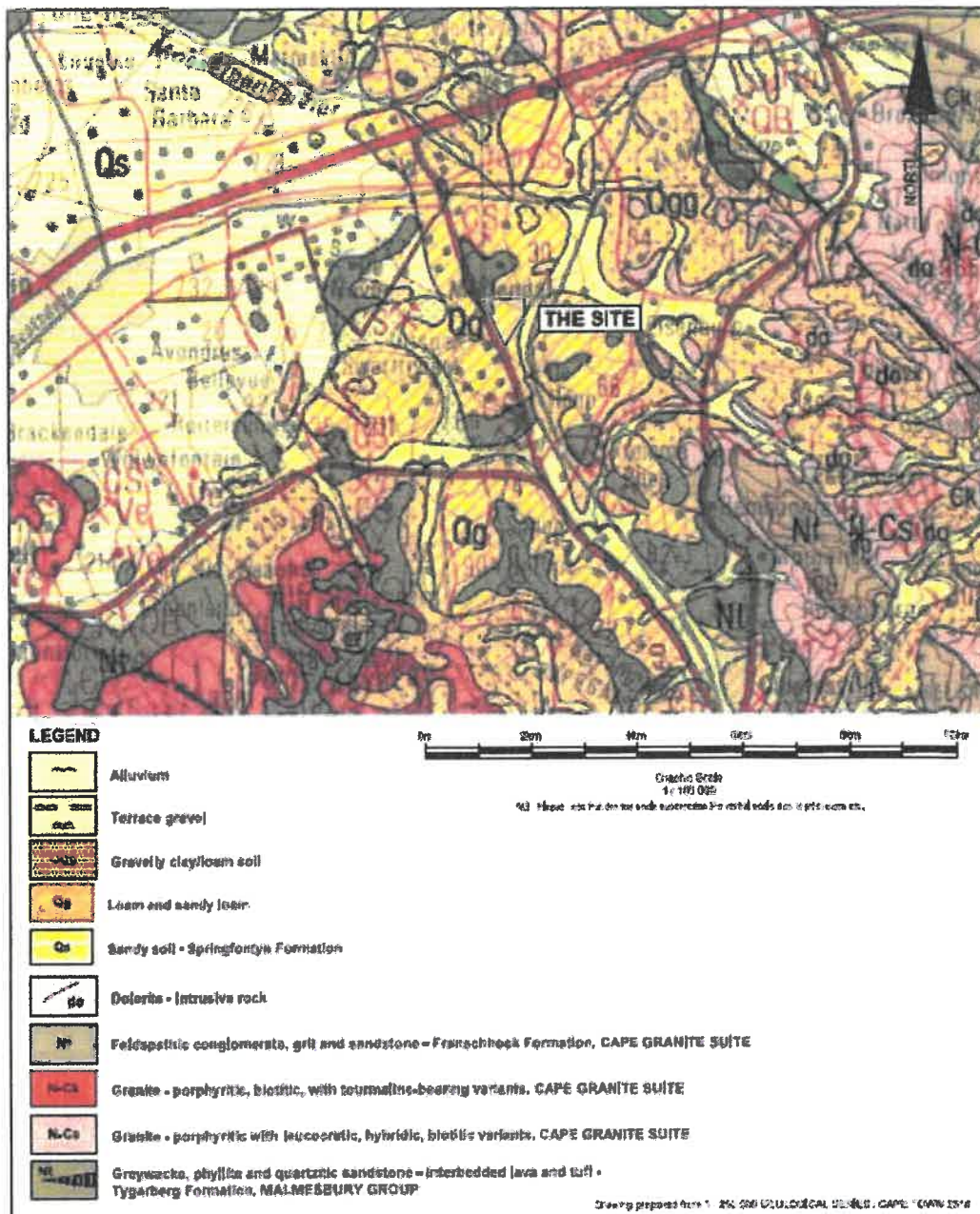


Figure 3. Geological map of the Calcutta 29 Memorial Park study site based on 1: 250 000 geological sheet 3318 Cape Town (Council for Geoscience, Pretoria) (Image abstracted from 2018 geotechnical report by Gondwana Geo Solutions (Pty) Ltd, Durbanville). The study site is underlain at depth by Late Precambrian metasediments of the Tygerberg Formation (Malmesbury Group) (Nt, grey) that are mantled by Late Caenozoic loamy and sandy soils (Qg, yellow with orange cross-hatch).





**Figure 4. Typical view of abandoned, overgrown eucalyptus plantations in the Calcutta 29 Memorial Park study area.**



**Figure 5. Open areas with disturbed sandy soils.**



**Figure 6. Laterally-persistent, rusty-brown ferricrete hardpan overlying pale, clay-rich saprolitic subsoils, western edge of the study area adjoining the R304 tar road.**



**Figure 7. Test-pit area showing pale sandy soils with sparse, dispersed gravels of rusty sandstone, kaolinitised granite, weathered Tygerberg Formation wackes and quartzites as well as pale calcrete (Hammer = 30 cm).**



**Figure 8. Test pit area showing pale sandy soils.**

### 3. PALAEOLOGICAL HERITAGE

Given their low metamorphic grade and Ediacaran age, the **Malmesbury Group** metasediments are *potentially* fossiliferous where levels of tectonic deformation are low (Belcher & Kisters 2003, Gresse *et al.* 2006). There is an unconfirmed report of bioturbation by sand-infilled invertebrate burrows within sandstone facies of the Tygerberg Formation on Robben Island (Nakashole 2004) as well as other unconfirmed reports of small-scale traces - some of which may be faecal pellet arrays - within Tygerberg rocks at Bloubergstrand (A. Kisters & C. de Beer, pers. comm., 2018). Groups of fossils that may have originally been preserved within siliciclastic or minor carbonate sediments of the Malmesbury Group include trace fossils, stromatolites, organic-walled microfossils (*e.g.* acritarchs) as well as the enigmatic vendobiontans. However, extensive deformation, including intense folding, faulting, quartz veining and cleavage development, as well as regional metamorphism during the Late Proterozoic to Cambrian Saldanian Orogeny (mountain-building event) have probably obliterated most organic remains, with the possible exception of some trace fossils and microfossils. Micropalaeontological analysis of these difficult rocks is now in progress (G. Germs, pers. comm. 2008). The more pelitic (clay-rich) Malmesbury rocks have additionally suffered extensive chemical weathering under humid tropical conditions during Cretaceous and Tertiary times so that away from the coast fresh bedrock is almost universally covered with a deep mantle of multi-hued, kaolinitic and ochreous saprolite (*in situ* weathered rock) and surface gravels (sometimes silcretized). This certainly applies to the Tygerberg Formation bedrocks beneath the present study area where fresh, potentially-fossiliferous Tygerberg bedrocks are very unlikely to be encountered near-surface.

The **Cape Granites** - if also represented at depth beneath the study area - are entirely unfossiliferous igneous rocks.

The **Late Caenozoic alluvial deposits and soils** underlying the study area are generally of low palaeontological sensitivity. They might locally contain sparse remains of transported plant material (*e.g.* peats, subfossil wood), calcretized rhizoliths (root casts), termitaria and other burrows, freshwater invertebrates (*e.g.* molluscs such as unionid bivalves, gastropods), tortoise remains or rare mammalian bones, horn cores and teeth (*cf* Klein 1983, 1984). To the author's knowledge, fossils have not been recorded from within the widespread Late Caenozoic ferricretes of the

interior Western Cape. However, at near-coastal fossil dune sites (e.g. Elandsfontein near Saldanha) mammalian bones and teeth as well as stone artefacts of Pleistocene and younger age may be deflated down onto the upper surface of ferricrete hardpans. These were often formed in areas of high water tables, such as around vleis and streams, that would have attracted game animals as well as humans, amphibians and freshwater molluscs in the past (cf Roberts 1996, Klein *et al.* 2006). There are no fossil records of Tertiary or Quaternary vertebrates from the study region mentioned in the key reviews by Hendey (1984) and Klein (1984).

No fossil remains were recorded on Farm Calcutta RE/29 during the short palaeontological site visit. It is concluded that the palaeontological sensitivity of the Memorial Park study area is very low.

#### 4. CONCLUSIONS & RECOMMENDATIONS

Late Caenozoic superficial deposits (sandy soils, ferricrete, stream gravels) as well as the underlying, deeply-weathered bedrocks of Malmesbury Group metasediments intruded by Cape Granite in the Memorial Park study area are all of low palaeontological sensitivity (Almond & Pether 2008). The proposed cemetery development is very unlikely to entail significant impacts on palaeontological heritage. There are therefore no objections on palaeontological heritage grounds to authorisation of the proposed development.

**It is recommended that, pending the exposure of significant new fossils (e.g. mammalian bones and teeth) during construction, exemption from further specialist palaeontological studies and mitigation be granted for this development.**

If fossil material is discovered during construction, this should be safeguarded, preferably *in situ*, and the ECO should alert Heritage Western Cape (Contact details: Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za) so that appropriate mitigation (*i.e.* recording, sampling or collection) can be taken by a professional palaeontologist. The specialist involved in mitigation work would require a collection permit from Heritage Western Cape. Fossil material must be curated in an approved repository (e.g. museum or university collection) and all fieldwork and reports should meet the minimum standards for palaeontological impact studies developed by SAHRA (2013). A tabulated Chance Fossil Finds Protocol is appended to this report. These recommendations should be incorporated into the Environmental Management Plan for the proposed developments.

Please note that:

- All South African fossil heritage is protected by law (South African Heritage Resources Act, 1999) and fossils cannot be collected, damaged or disturbed without a permit from Heritage Western Cape or SAHRA;
- The palaeontologist concerned with potential mitigation work will need a valid fossil collection permit from HWC or SAHRA and any material collected would have to be curated in an approved depository (e.g. museum or university collection);
- All palaeontological specialist work should conform to international best practice for palaeontological fieldwork and the study (e.g. data recording fossil collection and curation, final report) should adhere as far as possible to the minimum standards for Phase 2 palaeontological studies developed by HWC (2016) and SAHRA (2013).

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VON VEH, M.W. 1983. Aspects of the structure, tectonic evolution and sedimentation of the Tygerberg Terrane, southwestern Cape Province. Bulletin of the Precambrian Research Unit, University of Cape Town, B32, 88 pp.

#### **QUALIFICATIONS & EXPERIENCE OF THE AUTHOR**

Dr John Almond has an Honours Degree in Natural Sciences (Zoology) as well as a PhD in Palaeontology from the University of Cambridge, UK. He has been awarded post-doctoral research fellowships at Cambridge University and in Germany, and has carried out palaeontological research in Europe, North America, the Middle East as well as North and South Africa. For eight years he was a scientific officer (palaeontologist) for the Geological Survey / Council for Geoscience in the RSA. His current palaeontological research focuses on fossil record of the Precambrian - Cambrian boundary and the Cape Supergroup of South Africa. He has recently written palaeontological reviews for several 1: 250 000 geological maps published by the Council for Geoscience and has contributed educational material on fossils and evolution for new school textbooks in the RSA.

Since 2002 Dr Almond has also carried out palaeontological impact assessments for developments and conservation areas in the Western, Eastern and Northern Cape, Limpopo, Gauteng, KwaZulu-Natal, Mpumalanga, Northwest and Free State under the aegis of his Cape Town-based company *Natura Viva* cc. He has been a long-standing member of the Archaeology, Palaeontology and Meteorites Committee for Heritage Western Cape (HWC) and an advisor on palaeontological conservation and management issues for the Palaeontological Society of South Africa (PSSA), HWC and SAHRA. He is currently compiling technical reports on the provincial palaeontological heritage of Western, Northern and Eastern Cape for SAHRA and HWC. Dr Almond is an accredited member of PSSA and APHP (Association of Professional Heritage Practitioners – Western Cape).

#### **Declaration of Independence**

I, John E. Almond, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed development project, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



**Dr John E. Almond**  
**Palaeontologist**  
***Natura Viva* cc**

<b>CHANCE FOSSIL FINDS PROCEDURE: Proposed Memorial Park on Farm Calcutta RE/29 near Stellenbosch</b>		
<b>Province &amp; region:</b>	<b>WESTERN CAPE, Cape Winelands District Municipality</b>	
<b>Responsible Heritage Resources Authority</b>	Heritage Western Cape (Contact details: Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za)	
<b>Rock unit(s)</b>	Weathered Tygerberg Formation (Malmesbury Group); Late Cenozoic soils, ferricretes, alluvium	
<b>Potential fossils</b>	Calcretized rhizoliths (root casts), termitaria and other burrows, freshwater molluscs, ostrich egg shells, sparse bones, teeth and horn cores of mammals, and tortoise remains	
<b>ECO protocol</b>	1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately ( <i>N.B.</i> safety first!), safeguard site with security tape / fence / sand bags if necessary.	
	2. Record key data while fossil remains are still <i>in situ</i> : <ul style="list-style-type: none"> <li>• Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo</li> <li>• Context – describe position of fossils within stratigraphy (rock layering), depth below surface</li> <li>• Photograph fossil(s) <i>in situ</i> with scale, from different angles, including images showing context (<i>e.g.</i> rock layering)</li> </ul>	
	3. If feasible to leave fossils <i>in situ</i> : <ul style="list-style-type: none"> <li>• Alert Heritage Resources Authority and project palaeontologist (if any) who will advise on any necessary mitigation</li> <li>• Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Authority for work to resume</li> </ul>	3. If <i>not</i> feasible to leave fossils <i>in situ</i> (emergency procedure only): <ul style="list-style-type: none"> <li>• <i>Carefully</i> remove fossils, as far as possible still enclosed within the original sedimentary matrix (<i>e.g.</i> entire block of fossiliferous rock)</li> <li>• Photograph fossils against a plain, level background, with scale</li> <li>• Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags</li> <li>• Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist</li> <li>• Alert Heritage Resources Authority and project palaeontologist (if any) who will advise on any necessary mitigation</li> </ul>
	4. If required by Heritage Resources Authority, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.	
	5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Authority	
<b>Specialist palaeontologist</b>	Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository ( <i>e.g.</i> museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Authority. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Authority minimum standards.	

**The Need for Burial Space in the Stellenbosch Municipal Area, 2018**

**A Socio-Economic Statement for the establishment of a Memorial Park in Stellenbosch North**

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## The need for burial space in the Stellenbosch Municipal Area, 2018

### A Socio-Economic Statement for the establishment of a Memorial Park in Stellenbosch North

#### 1. Statement Purpose

This statement outlines the socio economic cost to create burial space in the Stellenbosch Municipal Area.

A Socio-Economic Statements analyses i.e. predicts, reflects and manages but does not evaluate or rate, the intended and unintended consequences on the human environment of planned interventions (policies, programmes, plans and projects) and any social change processes invoked by those interventions so as to bring about a more sustainable and equitable biophysical and human environment (Vanday, 2002).

At a broad level the impacts on the overall welfare of a community should be investigated considering the efficiency, equity and sustainability of the project as well as the trade-offs or 'opportunity cost' the various alternatives will yield.

#### 2. Need for burial space

The scale of the need over the next 10 to 30 years for additional burial space was determined by considering the death rate and land required based on traditional burials.

##### a) Death Rate:

Cape Winelands experienced 6 560 deaths/out of 48 141 deaths in the Western Cape in 2016 translating in a death rate of 0.76%. Cape Winelands had a population of 866 223 people in 2016 with the highest number of deaths occurring in the age cohorts of 65+ followed by 45 – 64 and 15 – 44 as outlined below.

Age	0	1-14	15 - 44	45 - 64	65+	Unspecified	Total
Population	185	83	1 530	2 174	2 581	7	6 560

The table below provides a summary of leading causes of premature mortality in the Cape Winelands District Municipal Area compared to the Western Cape and South Africa. Stellenbosch Municipality form part of the Cape Winelands District Municipality:

Overall Rank	Cause	Western Cape		Cape Winelands		South Africa	
		Number	Percentage	Overall Rank	Percentage	Overall Rank	Percentage
1	Diabetes Mellitus	3 694	7.7	1	7.9	2	5.5
2	Human Immunodeficiency Disease (HIV/ AIDs)	2 975	6.2	2	7	5	4.8
3	Ischaemic heart disease	2866	6	6	5.2	9	2.8
4	Cerebrovascular disease	2 682	5.6	5	6.1	4	5.1
5	Tuberculosis	2 461	5.1	3	6.7	1	6.5
4	Chronic lower respiratory disease (Infections)	2 373	4.9	4	6.4	10	2.8
6	Malignant neoplasms of digestive organs	2 204	4.6	7	4.9		
7	Malignant neoplasms of respiratory and intrathoracic organs	2 193	4.6	8	4.9		
8	Hypertensive diseases	1 890	3.9	9	3.4	6	4.4
9	Other forms of heart disease	1 473	3.1	10	3.9	3	5.1
10	Other natural causes	16 497	35.2		32.7	11	43.8
11	Other non-natural causes	6 383	13.3		11.2	12	11.2
	Influenza & pneumonia					7	4.3
	Other viral diseases					8	3.6

Tuberculosis as the leading cause of death in South Africa, was ranked 5<sup>th</sup> in the Western Cape. Diabetes Mellitus was the leading (1<sup>st</sup>) natural cause of death in the Western Cape whilst it was second (2<sup>nd</sup>) in South Africa. Diabetes Mellitus is followed by Human Immunodeficiency Virus [HIV] disease and ranked as 2<sup>nd</sup> cause of death in the Western Cape whilst it ranked as the 5<sup>th</sup> cause of death in South Africa. Ischaemic heart disease ranked the 3<sup>rd</sup> cause of death in the Western Cape, whilst other forms of heart disease ranked the same in South Africa. Overall, the results show a considerable burden of disease from non-communicable disease and signs of a sizable proportion of deaths associated with diabetes mellitus, particularly for females.

b) Extent of traditional graves:

Extent of a grave: 2m x 1m (2.3m x 0.9m) = 2m<sup>2</sup>. Extent of a grave and space for movement: 3m x 2m = 6m<sup>2</sup>. Considering the cemetery as a park and a recreational amenity, the space per grave can be increased to 8m<sup>2</sup>.

c) Land requirements

Cape Winelands experienced 6 560 deaths/out of 48 141 deaths in the Western Cape in 2016 translating in a death rate of 0.76%. Cape Winelands had a population of 866 223 people in 2016

At 2016 death rate i.e. 757 deaths per 100 000 population per annum 4 542m<sup>2</sup> grave space per annum will be required. Over the next 30 years 14ha of land will be required. Providing for a park increases the extent to 18ha.

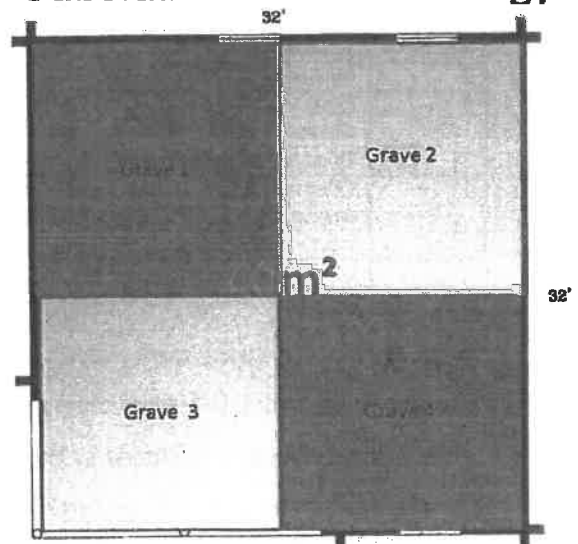
A 20ha – 30ha regional site should provide sufficient cemetery space for the next 30 years.

The required extent of the land can be compared to subsidized housing or a soccer field.

A subsidized house is 42m<sup>2</sup> in extent and equals 7 graves. On average 4 people inhabit a subsidized house. Thus half of the space we need for the footprint of a subsidized house we need for the graves of the household. Erven on which subsidized houses are built, are 80m<sup>2</sup> in extent and equals 13 graves. Thus one quarter of an erf of a fully subsidized house is required for burial space.

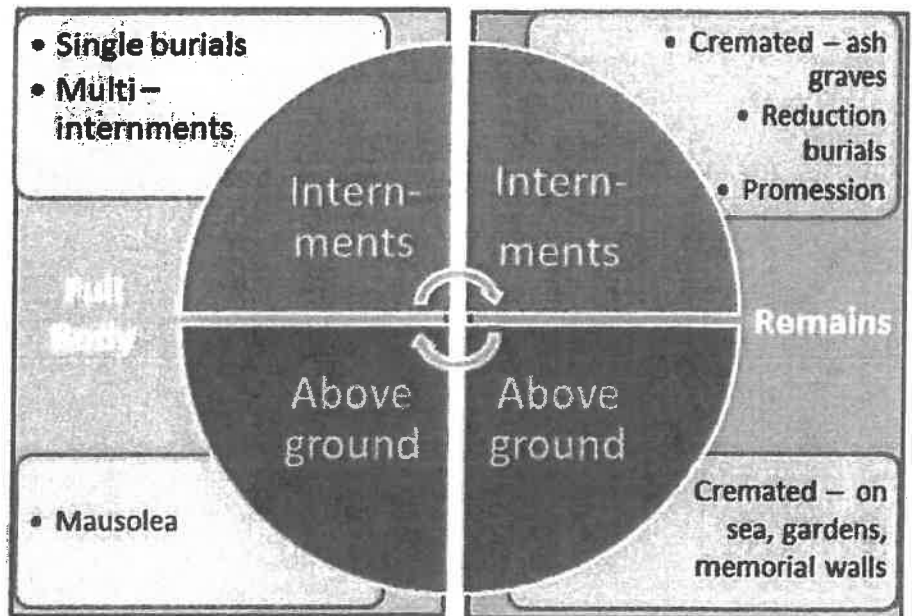
Alternatively, a soccer field is 0.72 ha or 7140m<sup>2</sup> and equals 1190 graves or 92 subsidized housing erven. Expressing it differently, Stellenbosch requires annually nearly one soccer field to provide for the number of deaths per annum.

### Subsidized House Analogy



### 3. Burial alternatives

Availability of land is the biggest challenge facing the cemetery sector in South Africa due to the increase in population growth within municipalities and cultural beliefs as it pertains to dealing with the deceased. A key solution to the inadequate land for cemetery development is the introduction of burial alternatives.



Several of these burial alternatives have existed for many years around the world, but are not actively practised in South Africa due to tradition. All alternative "memorials" other than traditional graves, i.e. memorial walls and parks, can be incorporated in cemeteries. The following should be considered when designing a cemetery:

- To approach cemeteries as a social space (including parks) in the design of cemetery site plans.
- To provide for all alternative burial methods even some of them may have a very slow uptake.
- To provide for inexpensive maintenance of cemeteries.
- To market alternative burial options.

Limited knowledge of and lack of exposure amongst communities to alternative ways of interment, the challenges for suitable land and the upkeep of traditional cemeteries are experienced. Alternative burial methods, which can be the solution to the land-hungry burial methods currently practiced in South Africa, has to be promoted and established. The different types of burials are categorized into four main categories.

## Burial Alternatives

Method	Tradition/ Believe	Required Space	Required Terrain	Decomposition Time	Cost	Maintenance
Mausoleum		A secure building with rows of crypts Above-ground burial space option Crypts are large enough to accommodate a coffin holding a full body or remains.	Rocky terrain or ground which may be unsuited to conventional burials	Once a crypt is sealed, it is ventilated to promote rapid body decomposition.	Designed to any size and specification.  Are a practical and cost-effective alternative to conventional tombstones	Generally clad with hardwearing stone or granite and are weather-resistant and maintenance-free. Crypts are sealed at the front with a concrete panel which is cemented closed.
Multi-Interments		Municipal by-laws allow for burial of more than one family member in a grave. Up to three bodies from the same family can be placed in the same grave.	This allows for cemeteries that are theoretically full - i.e. with a body in each grave - to continue being used.	A period of time, usually two years, is given before graves are re-opened and a new body can be placed on top of the previous remains, before being covered up again.	Cost decreased with the number of burials per grave.	High, similar than traditional burials.
Cremation	Common amongst Christians/West Standard practice amongst Hindus. Forbidden by Muslims and Orthodox Jews. African cultures, traditionally viewed as undesirable although not prohibited.	The deceased body is burnt to ash, which greatly reduces the mortal remains. Ashes are kept in an urn. Options of disposing of the ashes after a cremation include: - Memorial walls - Gardens - Ash graves	Any	None	Municipalities offer cremation as a burial option along with traditional burial. Cremations are cheaper than traditional burials.	Low
Reduction burial		The buried body is later exhumed and reinterred in a smaller casket, allowing for burying more family members in the same grave.		Shorter than traditional burials		Lower than traditional burials

Columbarium	Can house many people of different religions. Religious décor often adorns individual niches and/or urns for ashes.	Take a variety of forms and are, occasionally quite elaborate structures. But, more often, they follow elegant-but-simple architectural designs and are part of large, urban cemeteries.	Many churches have columbaria built into their structures or erected onto their grounds.			Low
Promession (freezing)	Similar to cremation	Promession is when the body is frozen with liquid nitrogen and then vibrated to disintegrate. The pieces are freeze dried and placed in a biodegradable casket.		Caskets are interred in the top layers of soil, where aerobic bacteria cause complete decomposition in six to 12 months.	High due to irregular usage	Low

#### 4. Socio economic Cost

The socio economic cost and benefits are outline below and listed as a general cost or benefit, followed by specifics for the proposed memorial site and concluded with management directives. Burial alternatives, although provided, are not assessed.

Anticipated & Predicted Impacts	Calcutta	Management directives
<b>Population Characteristics/Human capital</b>		
<b>Job and skills levels increase:</b> A 30ha memorial park will require landscaping, manicuring and maintaining. Sustainable employment opportunities will be created by	Five to ten (5 – 10) full time permanent jobs are required to landscape, maintain and manicure the	Employees should be selected and appointed from within Stellenbosch Municipal Area.

the park.	memorial park.	Those employed to do so and who may not have appropriate qualifications/ skills should be afforded the opportunity to obtain the qualification/ skills.
<p><b>Social health of community/ youth</b></p> <p>As a memorial park is a place to celebrate life, it represents a social space reflecting the value a community attach to the memories of their family, friends and colleagues. A memorial park will become such a social space.</p>	<p>Entrance control of the site and control of allowable activities will enhance the celebration of life.</p> <p>The park should be managed as a park and visual links should be created to the outspan site and historical oak trees south of the Calcutta. The trek path should be celebrated and replaced as a recreational route.</p>	<p>Entrance to the cemetery should be controlled during the day and the cemetery should be locked at night.</p> <p>Voluntary manicure and maintenance programmes should be managed involving educational institutions.</p> <p>Linking the site to a network of recreation routes i.e. walking or cycling will expand the celebration of life.</p>
<p><b>Crime/ Neglect</b></p> <p>Safety of visitors are key and controlled access and activity are but some of the aspects to ensure security of burial sites and safety of</p>	<p>The memorial park will be a significant improvement as the Eucalyptus and Acacia woodlot on site is used as a dumping site and is by no means inviting for</p>	<p>The memorial park will be managed similarly to the cemetery at Jamestown; entrance control should be stricter.</p>

visitors.	people to perceive it as a social space or amenity.	
<b>Community &amp; Institutional Arrangements</b>		
The lack of cemetery space may disrupt social networks which will bring about changes in social ethos of community.	The MP will provide the required cemetery space and celebrate the lives of the deceased and honour the dead.  Community homogeneity and cohesion could be reduced as community members will be forced to bury elsewhere outside Stellenbosch. This may bring the Stellenbosch community in conflict with receiving neighbouring communities.	Provide a MP in each of the major municipal areas i.e. north and south  Regulate the use of burial space and rent out space for a specific period i.e. 25 years or less.
<b>Equality and Exclusivity:</b> A memorial park provides for all income groups, all cultures and all religions: The MP and its design and use should not exacerbate class equalities or cultural exclusivity. The MP should make allowance to accommodate dissimilarities in social practices i.e. social standards (burial options), religion and values.	MP to provide for all income groups and all religions.	Develop a MP policy or by-law to address access to resources i.e. burial space.  Allow for limited economic opportunity i.e. flower sellers and a nursery. Economic opportunity to be ceased by vulnerable members of the community.
<b>Employment equity of vulnerable groups:</b> Of the people employed, women and youth	The employment opportunities at the MP will enable a few families to benefit from the employment	As women and youth have to compete with more appropriately qualified applicants from



should be afforded the opportunity to join the workforce.	opportunities associated with MP development.	Stellenbosch Municipal area, skills development and improvement of educational qualification should be a strong project component.
<b>Political &amp; Social Resources</b>		
<b>Use of social amenities:</b> The MP will provide for the need for burial space within the Stellenbosch community but may cause an increased demand from neighbouring municipalities for burial space.	<p>The demand for basic services i.e. water, electricity and sewerage will be limited and not compete with the requirements for human settlements within the Stellenbosch Municipal area.</p> <p>As far as possible the MP services have to be sourced and generated on site.</p> <p>Water sources should be protected from possible impacts.</p>	<p>Regulate burial space to benefit the community of Stellenbosch.</p> <p>Alternative energy use should be promoted.</p> <p>Water should be sourced on the property.</p> <p>Sewerage should be managed on site.</p> <p>A resource management plan should be compiled and implemented as part of the maintenance and management of the site.</p>
<b>Increased use of municipal &amp; authority services</b> will be required but merely to regulate and guide traffic.	<p>The slow moving traffic of funeral processions will disrupt daily traffic which is fast moving and will impact on cyclists using the R304.</p> <p>Processions should not be allowed on provincial roads. Encourage users of the MP to hold services on</p>	<p>Regulate traffic and abandon processions.</p> <p>Develop an amenity information brochure marketing the facility and the different components thereof i.e. the chapel that is interdenominational.</p>

	site.	
<p><b>Individual &amp; Family Changes:</b></p> <p>Burial practices are often linked to religious practices. Family burial practises may change over time.</p>	<p>Provide for alternative burial options in the MP.</p>	<p>Families have to be encouraged to consider different burial options which are less land dependant.</p> <p>Develop a burial alternative awareness campaign.</p>
<b>Community Resources</b>		
<p><b>Dust &amp; Noise levels:</b> Sporadic dust &amp; increased noise levels may occur as the park is established, graves are prepared and burial ceremonies are taking place. It is anticipated that all of the above will happen but within acceptable levels.</p>	<p>Keep dust suppression measures accessible on site. The necessary equipment and procedures have to be supplied and be in place.</p>	<p>Regulate noise on site and compile standard operational procedures.</p> <p>Budget and provide for dust suppression measures and equipment on site.</p>
<p><b>Sense of Place:</b> The change of sense of place will impact on people's relationship to environment and surroundings.</p>	<p>Visual and scenic issues, and thus sense of place, relate to the likely impact of this memorial park development on the Grade IIIb agricultural landscape. As the site is covered by an immature gum and Acacia plantation and has an untidy, overgrown atmosphere the change in use will enhance the</p>	<p>Design and compile a landscape plan to ensure the conservation of the landscape.</p>

	<p><b>Landscape Character</b> of the site. The site is surrounded by vineyards and rolling pastures and a scatter of European Oak trees down to the river. The high visual absorption capacity of the site and the low absorption capacity of its surroundings and its visibility versus the proposed activity will enhance the impact to be positive. Cemetery activities on site could easily be hidden behind decent landscaping, where structures are low with the exception of a central chapel facility.</p>	
<p><b>Social History:</b> The social history relates to patterns that were valued, but fallen into disuse (outspans), and which is part of the social history of an area will be enhanced.</p>	<p><b>Heritage Grading</b></p> <p>There are no structures on the site to grade but the area landscape has already been graded IIIb in the SHS&amp;MP (2018), as has the outspan site on the southern portion been graded IIIb. Calcutta Bos has high significance as an historic outspan site but a low significance as a woodlot in its current condition. Its rural setting makes it well-suited to the purposes of a memorial park.</p> <p>Being one of only seven or eight outspans it is quite prominent in the Stellenbosch District. Changing its</p>	<p>Should any heritage resources be discovered during the clearing of the site, the appropriate procedure required by HWC should be followed to secure and conserve such resources.</p> <p>The potential scientific significance of the site lies in the possibility of uncovering any significant archaeological remains. This will not be known until such time as excavation or development occurs but it is unlikely that anything would be recovered until such time</p>

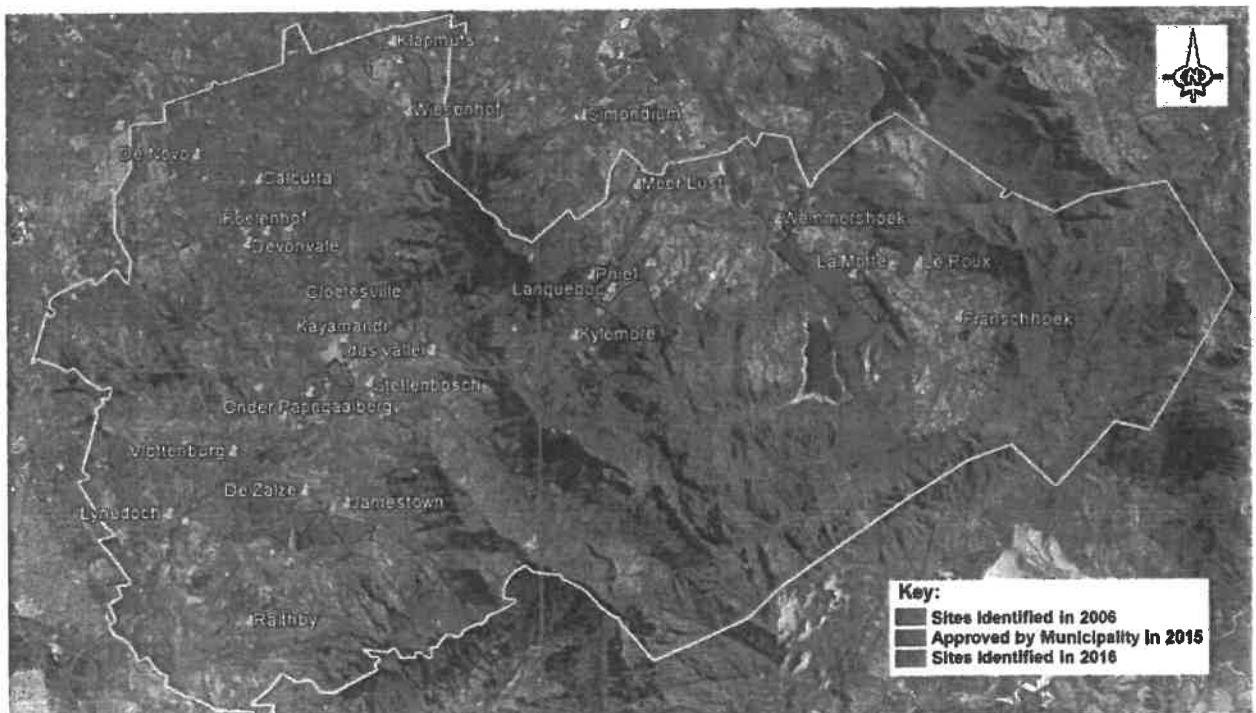
	use to a memorial park where the deceased are laid to rest at the end of their life's journey, and being jointly a recreational park should enhance Calcutta outspan's collective heritage.	as it is densely covered and transformed by, at the very least, gum plantation. It could have been ploughed prior to gum planting.
<b>Access to leisure opportunities:</b> MPs as commissioned by Stellenbosch Municipality are simultaneously designed to enhance recreation and leisure opportunities: hiking & biking trails etc.	The MP will enhance access to leisure opportunities.	Encourage leisure and recreational activities i.e. compile and market a park calendar.
<b>Access to natural resources:</b> The MP has no impact on people's access to natural resources i.e. wood, water and medicinal plants	The MP should enhance to use of natural resources and should not compete with the community's access i.e. use of on-site sources to provide water, manage sewerage and generate alternative energy.	Compile a resource management plan.
<b>Sales &amp; GGP:</b> Sales related to the land will contribute to the economy of the municipality.	Burial space will have to be leased for limited periods of time i.e. 25 years or even shorter.	Regulate use of burial space.  Provide for subsidies for vulnerable communities.

## 5. From cemeteries to Memorial Parks

The strategy Stellenbosch adopted to provide burial space were twofold: Expanding local cemeteries and establishing regional cemeteries in Stellenbosch Municipal Area.

The following three regions were identified and sites per region were identified and assessed according to the criteria in Addendum A.

- Region 1: Northern Stellenbosch
- Region 2: Eastern Stellenbosch (Franshoek Valley)
- Region 3: South Stellenbosch



The site for Eastern Stellenbosch has not been promoted as yet as most of the area is located within the Berg River flood plain.

### Site Identification

Selection was informed by several studies and activities i.e.

- a) a 2006 Cemetery Feasibility Study conducted by Dennis Moss Partnership.
- b) site visits by CK Rumboll and Partners in May and June 2016.
- c) Sites identified by the Property Management Department of Stellenbosch Municipality.
- d) Sites approved on a Stellenbosch Council meeting, various dates 2015 – 2018.

### **Initial Assessment**

The preliminary scan of 50 sites considered the following:

- a) Ownership, Use, Zoning and Proximity
- b) Value (intrinsic, instrumental, systemic), Environment (Fauna & Flora, Ecological Rehabilitation, Geology, Pedology, Hydrology) and Policy Assessment (Access, Competing uses, SDF & IDP aligned)
- c) Digging graves: Soil excavability, permeability (distance from domestic water sources, drainage features and soil type), drainage features, gradient, basal buffer, grave stability, soil workability and cemetery size

Sites were separated into cemeteries that can expand and new cemeteries smaller than 30ha, regional cemeteries and full cemeteries that cannot expand.

### **Cemeteries that can expand and new cemeteries smaller than 30ha**

This category were further divided into

- o Extensions identified on land belonging to Stellenbosch Municipality: At Franschoek and Stellenbosch (Onder Pappagaalberg) (expand graveyard sites), Kylemore, Pniel (develop new cemeteries on erven adjacent to existing cemetery).
- o New cemeteries identified on land belonging to Stellenbosch Municipality: at Pniel (open space across existing cemetery)
- o Extensions identified on state land within the jurisdiction of Stellenbosch Municipality at De Novo.
- o A new cemetery identified on state land at La Motte (existing cemetery does not have the appropriate zoning).
- o Extensions identified on private land at Le Roux (Dennegeur), Franschoek, Languedoc, Klapmuts and Pniel.
- o New cemeteries identified on private land at Klapmuts and Pniel.

### **Full cemeteries**

Seventeen (17) Cemeteries are fully occupied and need cleaning, remarking of graves, fencing and upkeep.

### **Sites not further assessed**

There were sites that were not further considered as they did not meet the environmental and policy assessment criteria i.e.

- Proximity to the settlement
- Entire site earmarked for housing
- Earmarked for recreation and youth development
- Undesirable slopes

- Earmarked for road and infrastructure upgrades
- Watercourses, water quality and soil characteristics

### **Regional cemeteries**

Regional cemeteries were identified in Jamestown, Lyndoch, Klapmuts, La Motte, Maasdorp (on R45 to Franschoek), Meerlust (T junction of R45 (Paarl to Franschoek) and R310 (to Stellenbosch)), Wemmershoek (R301) & Wiesenhof (R44).

Identification of regional cemeteries was narrowed down on land belonging to Stellenbosch Municipality at or close to James Town, Koelenhof and Wemmershoek. Only state land is available for a regional cemetery in Eastern Stellenbosch or the Franschoek Valley at La Motte, Maasdorp and Meerlust and in Northern Stellenbosch at de Novo.

Regional cemeteries on private land within the jurisdiction of Stellenbosch Municipality, have been identified at Jamestown, Klapmuts and Lyndoch.

From these, two regional sites were selected to obtain the appropriate authorisations to establish two regional memorial parks: i.e. Calcutta and Louw's Bos

## **Addendum A: Selection Criteria**

Sites were subjected to a set of selection criteria:

### **a) Initial (Ownership and Proximity) Assessment**

The purpose of this assessment is to determine which identified portions of land can be utilized as a local or regional cemetery and to determine the time frames involved in obtaining the appropriate rights and authorizations.

1. **Ownership:** Does the property belong to Stellenbosch Municipality, a State Department or a private person.
2. **Zoning:** What is the official zoning of the property?
3. **Current Land Use:** What is the property used for?
4. **Lease:** Is the property leased. If yes, for how long is the duration of the lease.
5. **Transfer:** If the property is not owned by Stellenbosch Municipality, it has to be transferred.
6. **Location:** Is the proposed development an extension of the existing cemetery or is it a completely new cemetery.
7. **Proximity:** Is the cemetery accessible for the region or only for the settlement in which it is located?

This assessment was done according to information as per the following documentation and site visits: ownership records, zoning certificates and diagrams.

### **b) Environmental and Policy Assessment**

The purpose of this assessment is to determine if there are any policies or natural aspects that may prohibit the expansion or development of cemeteries.

8. **Intrinsic Value:** What is good for the property? (Use & Heritage Value)
9. **Instrumental Value:** What is the property good for? (SDF alignment)
10. **Systemic Value:** Does the property contribute to the health of any eco system and or habitat? Is the property important for conservation purposes (does it form part of a sensitive ecological corridor which may include part of stream, drainage systems & wetlands and may be subject to ground water pollution.
11. **Current status:** Is there any indigenous Fauna and Flora habitats on the property and are there occurrence high or are there stands of rare endemic plants.
12. **Ecological Rehabilitation:** What should the property look like if restored to its pristine form? How did it look like? What are the likelihood/ potential of the property being rehabilitated?



13. **Geology:** What are the Solid features of Earth
14. **Pedology:** Status of soils in their natural environment
15. **Hydrology:** Are there any drainage lines
16. **Accessibility:** Is there physical access to the site? How easily can the site be accessed? What modes of transport can be used to reach the site? What modes of transport are available?
17. **Land Availability:** What are the competing uses in the area?

This information was gathered as per data available, site visits, previous studies conducted (see Reference List) and a meeting with municipal officials representing different departments; Data available included zoning maps, ecological and hydrological data, geological data, roads network data, programmes & projects from other municipal departments.

### **c) Soil Scan**

The purpose of this assessment is to determine if the site will be functionally appropriate to dig graves and bury people.

18. **Soil excavability:** Is the soil medium dense and firm
19. **Soil permeability:** Safe distance from domestic water sources (No – too close; Conditional - Certain forms of burials only i.e. walls of remembrance; Developable)
20. **Soil permeability:** Soil type (Clay Gravel, Silty Sand, Clay Sand, Silt) and permeability ranges. Poor subsurface conditions, either high water table or clay layers - grave surface flooding or perched water tables
21. **Soil permeability:** Safe distance to drainage features and sources (No – too close; Conditional - Certain forms of burials only i.e. walls of remembrance; No - Adequate surface drainage difficult - flat topographical features)
22. **Drainage features:** Present, Partial or Absent
23. **Topography:** Gradient 2° - 6°. No when slope exceeds 9°.
24. **Basal Buffer Zone:** 2.5m between grave & water table. No when basal buffer is absent.
25. **Grave Stability:** Verges & Sides to stand up.
26. **Soil Workability:** Ability of soil to compact on return to grave
27. **Cemetery Size:** Justify engineering geological & geotechnical investigation

This information was gathered as per data available, site visits and previous studies conducted and meetings with the Directorate Community Services. Data available included hydrological data, geological data and a full assessment of Wemmershoek as a housing development.

## Addendum B: Sites investigated

No	Property Number & Settlement (Alphabetic)	Existing Cemeteries	Identified			Approved by Municipality (February 2015)
			Feasibility Study 2006 (Dennis Moss)	Site Visits & Scan, 2016 (CK Rumboll)	Property Management: Stellenbosch Municipality 2016	
1	RE 10/727 De Novo					
2	RE/3666 Franschoek, DenneG					
3	Erf 1219 Franschoek, Le Roux					
4	Erf 516 Franschoek					
5	Erf 423 Franschoek					
6	Erf 41 Franschoek					
7	Erf 428 Franschoek					
8	Erf 42 Franschoek					
9	Erf 16 Franschoek					
10	Erf 739 Franschoek					
11	Erf 2885 Franschoek					
12	Erf 2886 Franschoek					
13	RE/502 Jamestown					
14	1166 Jamestown					
15	RE/527 Jamestown					
16	RE 13/1674 Languedoc					
17	RE 1/619 Lyndoch					
18	Farm 342 Klapmuts					
19	8/744 Klapmuts					
20	RE/2/744 Klapmuts					
21	7/748 Klapmuts					
22	3/748 Klapmuts					
23	40/748 Klapmuts					
24	Erf 9 Kylemore					
25	Erf 21 Kylemore					
26	Erf 71 Kylemore					
27	Erf 35 Kylemore					
28	Erf 36 Kylemore					
29	RE1/1339 La Motte					
30	1653 La Motte					
31	1/1158 La Motte					
32	RE/1158 La Motte					
33	Farm 7/1041 Maasdorp					
34	Farm 28/1041 Maasdorp					
35	1/1006 Meer Lust					
36	RE/1 Pniel					
37	9/1173 Pniel					
38	2/1647 Pniel					
39	1357 Pniel					
40	RE1/1176 Pniel					
41	17/1685 Pniel					
42	4/941 Simondium					
43	Farm 2/81 Kayamandi					
44	181 Stellenbosch					
45	RE/33/175 Stellenbosch					
46	RE/183 Stellenbosch					
47	RE/1/1024 Wemmershoek					
48	202 Wemmershoek					
49	23/747 Wiesenhof					
50	Farm 29 Koelenhof (Calcutta)					

**Addendum C: Full cemeteries**

Cemeteries that are fully occupied and need cleaning, remarking of graves, fencing and upkeep are listed below:

	Property	Owner	Zoning
24	Erf 1219 Franschoek, Le Roux	Mun Gebied van Farnschhoek	Local Authority Zone
25	Erf 41 Franschoek	Ned Ger Sendingkerk Franschoek	Local Authority Zone
26	Erf 42 Franschoek	Ned Ger Kerk Franschoek	Local Authority Zone
27	Erf 423 Franschoek	Roux David Marais	Local Authority Zone
28	Erf 428 Franschoek	Congregational Church Franschoek	Local Authority Zone
29	Erf 16 Franschoek	Ned Ger Franschoek	Local Authority Zone
30	RE/527 Jamestown (Unregistered Portion 6/527)	Mun Stellenbosch	Agriculture Zone 1 (Local Authority (Cemetery))
31	7/748 Klapmuts	Volle Evangelie Kerk van God in Suidelike Afrika Klapmuts	Agriculture Zone 1
32	3/748 Klapmuts	Volle Evangelie Kerk van God in Suidelike Afrika Klapmuts	Agriculture Zone 1
33	Erf 9 Kylemore (re use western side)	Mun Stellenbosch	Open Space II
32	Erf 21 Kylemore	Mun Stellenbosch	Subdivisional Area for Residential Zone 1 and Transport Zone II (public road)
33	Erf 71 Kylemore	Old Apostolic Church of Africa	Open Space II
34	Erf 35 Kylemore	Mun Stellenbosch	Open Space I
35	RE/1 Pniel	Gemeenskap van Pniel	Open Space for Pniel Cemetery Authority Use for rest of property
36	Farm 190, Stellenbosch	Mun Stellenbosch	Local Authority (Cemetery)
37	Farm 191, Stellenbosch	Mun Stellenbosch	Local Authority (Cemetery)
38	Farm 285, Stellenbosch	Mun Stellenbosch	Local Authority (Cemetery)

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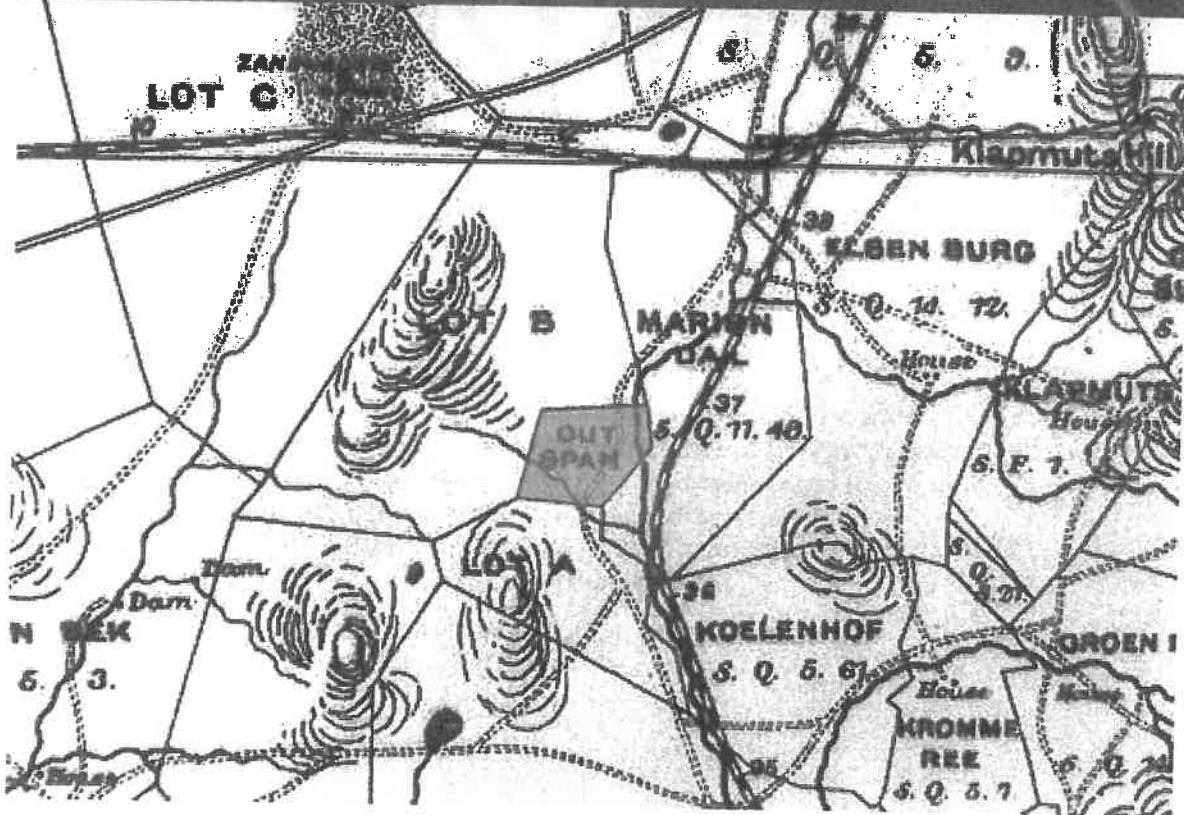
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**ANNEXURE W**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**HERITAGE IMPACT STUDY**



## CALCUTTA BOS MEMORIAL PARK

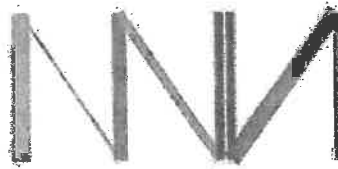
HERITAGE IMPACT ASSESSMENT

On the Farm Calcutta 29, Stellenbosch

November 2018 ☞ Photograph 1: View of the site from the R304/1890 Map

researched and produced by

New World Associates © for CK Rumboll & Vennote



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**New World Associates, Landscape Architects—  
newworld@telkomsa.net.**

**This report should be printed double sided if at all.**



## ∞ Reflection

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∞ At its simplest, a conservation plan is a document which sets out what is *significant* in a place and, consequently, what policies are appropriate to enable that significance to be retained in its future use and development.

James Kerr, *The Conservation Plan*

∞ Section 5 (7) (f) notes: "The identification, assessment and management of the heritage resources of South Africa must... be fully researched, documented and recorded."

*National Heritage Resources Act, 1999*

∞ Life can only be grasped by looking backwards,  
But must be lived forever forwards.

*Søren Kierkegaard, early 19th century*

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# 1 Executive Summary<sup>1</sup>

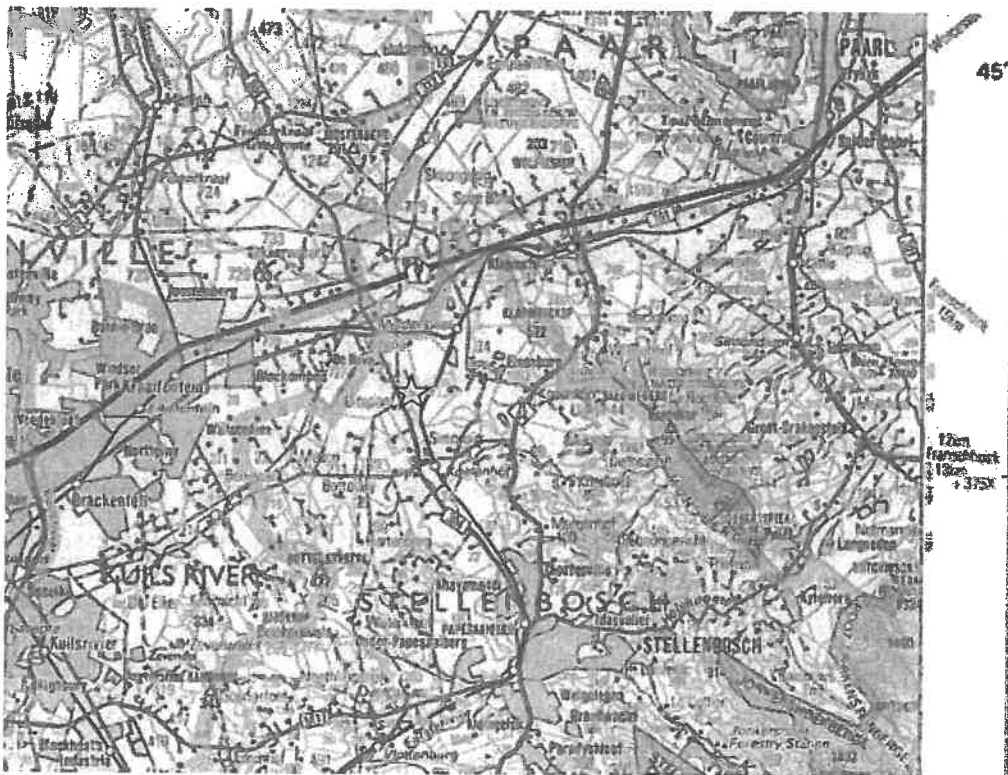
## 1.1 Site Name

1. The farm *Calcutta 29*, Stellenbosch.

## 1.2 Location

1. The entire property on the farm *Calcutta 29*, Stellenbosch on the R304 near Koelenhof.

### 1.2.1 Locality Plan



Source: Reproduced by permission of the Chief Directorate: Surveys and Mapping, State Copyright 2000.

**Figure 1-1: Location Plan.**

Portion of a 1:250,000 map of South Africa showing the site's location (3318 Cape Town, 9th Edition 2000). NTS.

<sup>1</sup> Formatted according to HWC Circular on Executive Summaries dated 12 March 2014 as required for submissions from 1 July 2014.

### 1.3 Description of Proposed Development (see page 63)

1. **Development Type:** The proposed cemetery at *Calcutta 29* is one of two regional cemeteries being planned for the Stellenbosch Municipality.
2. **Site Plan:** The cemetery concept plan prepared by OvP Landscape Architects (September 2018) is a first draft only. It shows a formal rectilinear layout with two axes, formal avenue planting, an informal parkland/open landscape zone to the south, and the main entrance to the north. It connects well with the surrounding landscape and is well conceived.

### 1.4 Heritage Resources Identified (see page 55)

1. **History:** The land on which "Calcutta", farm No 29 Stellenbosch is situated today was part of a "Crown Grant" to the town of Stellenbosch registered in about 1810.
  - Between 1925 and 1939 several small portions of this property were alienated for road-, power- and pipe line servitudes.
  - The remaining land was transferred to the Divisional Council of Stellenbosch on 12 August 1939 as the title deed register shows (see Figure 4-6).
  - Portion 1 of the farm No 29, Stellenbosch (27 morgen out of the original 74 morgen) was sold to Lucia Christine Jones (born Hattingh) MOCP (Married in Community of Property) on 14 February 1941.
2. **Heritage:** The area is marginal to the Stellenbosch Winelands but still contained within them. More pasture can be found here although there are some vineyards.
  - **The local Landscape Unit:** A11 Calcutta and wider open fallow land has already been graded **Grade IIIb** by the Stellenbosch Heritage Survey & Management Plan (2018), as has the **Calcutta Outspan IIIb** site on the property's southern tip.
  - **Graded Landscape Units** to the east around Elsenburg are **Grade IIIa**; while areas further east and south are graded **Grade II**.
  - **Graded Heritage Sites nearby include:** Elsenburg Pluimvee Proefplaas IIIa, Elsenburg x2 II, Elsenburg Pear Grove IIIc; Simonsig IIIc.
3. **Palaeontology:** No fossil remains were recorded on Farm Calcutta RE/29 during the short palaeontological site visit. It is concluded that the palaeontological sensitivity of the Memorial Park study area is very low.



- Late Caenozoic superficial deposits (sandy soils, ferricrete, stream gravels) as well as the underlying, deeply-weathered bedrocks of Malmesbury Group metasediments intruded by Cape Granite in the Memorial Park study area are all of low palaeontological sensitivity (Almond & Pether 2008).
  - The proposed cemetery development is very unlikely to entail significant impacts on palaeontological heritage. There are therefore no objections on palaeontological heritage grounds to authorisation of the proposed development.
4. **Archaeology:** "A field assessment of the subject property was undertaken on 18 October 2018, in which the following observations were made:
- No pre-colonial archaeological heritage was encountered during the study.
  - No buildings, structures or features were noted.

NB Archaeological visibility is extremely low due to dense vegetation cover, but indications are that the receiving environment is not a sensitive archaeological landscape.

5. **Visual-Aesthetic:** The following findings of the visual-aesthetic environment were observed.
- The site lies adjacent to the R304, which is not a designated scenic route. The route is of mixed scenic value, more so on the southbound journey with open views to the mountains.
  - The landscape is generally open and flat with a mixed agricultural feel of open pastures, vineyards and some agricultural technology developments.
  - The site itself is covered with dense, immature gum plantation making views into the site very short.
  - The site cannot be easily seen from other roads, if at all, and neighbouring farms alone would be able to access it on north, east and south boundaries.

## 1.5 Anticipated Impacts on Heritage Resources (see page 67)

1. **Heritage:** The potential impact of the proposed cemetery site on the old outspan is significant in that it is a wholesale change of land use from woodlot to cemetery. However, the draft concept plan has sensitively, if not, fortuitously, allowed for the conservation of the southern outspan site and surrounds in its overall framework. It would now be placed in the buffer informal parkland zone.

ous outspans' grading could only be made as part of a wider study of outspans and trekpaths. This 'recommendation' or suggestion is outside this HIAs mandate so is for consideration by the Stellenbosch Municipality as a separate study that could have both heritage and tourist value.

#### 1.6.4 Visual and Aesthetic

The following recommendations were extracted from the VIA (pp 53-55). Construction, Operation and Decommissioning recommendations are made on p 56.

##### Mitigation Recommendation: Planning and Design

The plans presented to date is an initial concept only. Therefore it is well able to take on any mitigation recommendations.

1. **Site Development Plan:** As noted previously, the concept plan is well conceived and sensitively fit to the landscape already:
  - 1.1 Taller structures such as the central facilities should be set back from the road as they are currently indicated and should not be moved to the edges of the site or nearer the R304.
  - 1.2 The landscape buffer along the edges is important to retain and should be well planted to prevent views into the site except at strategic locations such as on-axis.
  - 1.3 The HIA refers to the old *trekpath* to Klapmuts and the possibility of finding any historical aerial or other photographs that could be used to inform and retain any traces of the old outspan.
  - 1.4 Sustainable site development and Green Building principles or standards should be employed to enhance the environmental aesthetic.
  - 1.5 Lighting must be carefully managed to minimise excessive lighting wherever possible (see Operation Phase below).
2. **Colouration:** Careful colouration of fences in particular needs to be made, as well as any other landscape furniture such as lighting, benches, water features. These should preferably be in a natural colour palette that will not stand out from the agricultural landscape nor draw attention to itself with bright colouration. Likewise, building colours, walls and roofs, should be subtle.
3. **Landscape Plan:** The Landscape Plan should retain its existing features overall and not be changed to something completely different such as a freeform design. The tradition-

- al arrangement of cemeteries, the avenues and bounding walls will fit well into both the historical and cultural landscape.
- 3.1 Wherever possible the greening/planting of the scheme needs to be maximised.
  - 3.2 Permeable paving and other sustainable practices should be incorporated into the landscape plan.
  - 3.3 Planting using indigenous and preferably endemic species from the area should be planned from the beginning; traditional exotic trees are acceptable.
  - 3.4 Large trees should be incorporated into the Landscape Plan to screen tall buildings or unsightly areas such as the nursery/maintenance yard.
  - 3.5 Gum trees, pines and oaks, while not indigenous, are typically the only major trees that can survive the rugged environment and achieve the necessary scale. They are also traditional cultural elements and not out of place as a result.
  - 3.6 Indigenous/endemic trees can also be used but are not as tall as gums.
4. **Perimeter Treatment:** As described above this may incorporate screening trees or fences. The treatment of perimeter fencing and any signage needs to be carefully considered.
    - 4.1 Unsightly massive walls are not appropriate but the traditional low Cape farm werf wall may suffice well on the boundary and help locate the site on the R304.
    - 4.2 Should fencing be required use clear-view fencing or similar is preferred, not palisade. It should be coloured a dull green to match the local environment and not black, silver, brown or other unnatural, standard commercial colours.
  5. **Biodiversity:** As noted above, where possible, endemic planting schemes should be used with the exception of traditionally planted trees, which are permissible for practical and cultural landscape reasons.
  6. **Maintenance:** Scheme maintenance both of buildings and landscape need to be undertaken with commercial maintenance projects with this intention from the outset for the duration of the project. Good site tidiness should be maintained at all times.
  7. **Visual Assessor Review:** The proposed Landscape Plan should be referred to the visual impact assessor, namely, New World Associates, for review before it is approved, to ensure that it meets the recommendations of this report.

## 1.7 Authors and Dates

1. HIA: Bruce Eitzen (November 2018).
2. History: Dr Ute Seemann (October 2018).
3. PIA: John Almond (November 2018).
4. AIA: Jonathan Kaplan (October 2018).
5. VIA: Bruce Eitzen (November 2018).

NWA

## 2 Introduction

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New World Associates were appointed to prepare a Heritage Impact Assessment (HIA) for the Calcutta Bos Cemetery by CK Rumboll & Vennote. The proposed cemetery is one of three being developed by the Stellenbosch Municipality. A Notification of Intent to Develop (NID) has not yet been prepared. Bruce Eitzen is a registered Professional Landscape Architect and member of the Association of Professional Heritage Practitioners. Neither he nor any of the heritage specialists have any financial interest in the development.

### 2.1 Background

This *Heritage Impact Assessment (HIA)* is being prepared to fulfil requirements for Heritage Impact Assessment as required by the National Heritage Resources Act (25 of 1999) and as required by the National Environmental Management Act (107 of 1998).

### 2.2 Brief

New World Associates were appointed to prepare the Heritage Impact Assessment (HIA) for the above development by CK Rumboll & Vennote.

### 2.3 Methodology

The HIA was prepared using a combination of site visits, research and specialist studies into the relevant heritage attributes being impacted on by the proposed development.

#### 2.3.1 Notification of Intent to Develop (NID)

At this time no submissions have been made to Heritage Western Cape (HWC). However, a Heritage Screening was prepared by CTS Heritage in March 2018 for the site.

As determined by the Heritage Screener report, archaeological and landscape/visual studies should be prepared; these can be found in the appendices. The depth of study was determined using the PGWC Guideline for Involving Heritage Specialists in EIA Processes (see section 3.3.4).

### 2.3.2 Record of Decision (ROD)

At this time there is likewise no ROD to consider.

## 2.4 Statement of Independence

Bruce Eitzen is an accredited Member of the Association of Professional Heritage Practitioners of the Western Cape (APHP) specialising in Visual and Landscape Heritage. None of the consultants engaged in this study nor any authors of reports present have any financial interest in the proposed development, nor in any other projects being undertaken by the developers.

Bruce Eitzen holds a BSc (Botany) from the University of Cape Town and a Masters in Landscape Architecture (ML) from the University of Pretoria. He is a registered Professional Landscape Architect (PrLArch) with thirty years experience in South Africa and Southern Africa in Landscape Architecture and Environmental Planning including the specialities of Visual Planning and Heritage Planning. He has 15 years experience in the SW Cape.

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## 3 Legislative and Administrative Context

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### 3.1 Summary

There is a long history of environmental protection and management in South Africa rooted in EIA and IEM, which have given rise to the current requirement for HIA. The latest document (June 2005) prepared by the Provincial Government of the Western Cape defines the scope and preparation of HIAs. Provision in the various Acts is made for special areas and landscapes that have an important effect on the ranking of heritage impact in these areas. HIA, while being controlled by Heritage Western Cape (HWC), ultimately falls under the provincial Department of Environmental Affairs and Development Planning (DEA&DP). The property is rural and currently zoned Agriculture.

### 3.2 Introduction

This chapter provides the important and necessary legislative and administrative background for the heritage impact study. A general overview of the relevant documents with specific reference to those applicable to visual planning is included. Particular mention is made of local planning guidelines that have the most direct bearing on the project such as the Spatial Development Framework (SDF) for the given area.

#### 3.2.1 Background

The policy, legal and administrative framework for conservation, EIA and development in South Africa has long roots. Heritage Impact Assessment (HIA) is mentioned in the national requirements for EIA under the National Environmental Management Act (NEMA) and previously under the Environmental Conservation Act (ECA). Furthermore, the provincial government now endorsed its own guidelines for various EIA processes including HIA (PGWC, November 2005). Specific requirements for HIA may also be included in local Spatial Development Frameworks (SDF) and Integrated development Plans (IDP).

### 3.3 Legal Framework

This review of current documentation is made with specific reference to requirements for HIA in the Law and by National Guidelines.

#### 3.3.1 Environmental Impact Management: A National Strategy for IEM in South Africa (April 1998)

This discussion document on Integrated Environmental Management (IEM) defines IEM as: “the coordinated planning and management of all human activities in a defined environmental system, to achieve and balance the broadest possible range of short- and long-term environmental objectives.” Further: “The overarching goal of IEM is to help ensure that South Africa’s developing economy is redirected (or reoriented) from environmentally unsustainable growth and development towards environmental sustainability” (p 14). “Activities that IEM should manage” include: land use zoning plans and schemes, new activities, existing activities, and activities undertaken in terms of a land use zoning plan or scheme that has already been approved through IEM.”

In terms of Scoping as it relates to the compilation of reports such as this HIA, the Main Aims of Scoping are “to focus the study on reasonable alternatives and relevant issues to ensure that the resulting *Impact Assessment* is useful to the decision-maker and addresses the concerns of interested and affected parties” (p 5, *IEM Guideline Series: 2 Guidelines for Scoping*, 1992).

#### 3.3.2 National Environmental Management Act No. 107 of 1998 (NEMA)

This Act is “To provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.” Chapter 5: Integrated Environmental Management has among its general objectives: (b) “identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2” (p 34).

#### 3.3.3 South African National Heritage Resources Act, 1999 (NHRA)

NHRA regulations cover the protection of historic sites, objects, buildings and landscapes. It covers (ii) “archaeological items,” namely, “material remains resulting from human activity... older than 100 years;” rock art, wrecks and “features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are



found (2 Definitions). The Definitions also include the term “(vi) ‘cultural significance’ [which] means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.”

Further, (xxi) “‘living heritage’ means the intangible aspects of inherited culture, and may include: cultural tradition oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships.” (xxx) “‘Palaeontological’ means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.” (xxxviii) “Public monuments and memorials” and (xviii) “victims of conflict” relating to wars are also defined.

Section 38(1) defines triggers for HIA as a linear development over 300m long, or a bridge 50m long, or any development over 5,000 square metres (½ Hectare), involving three or more erven, rezoning over 10,000 square metres (1 Hectare) requires an HIA to be submitted if a heritage resource is likely to be affected. A Notification of Intent to Develop (NID) must be submitted the Heritage Authority “at the very earliest stages of initiating such a development.”

The Act prescribes in section 38(3) that the HIA must include:

- The identification and mapping of all heritage resources in the area affected;
- An assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;
- An assessment of the impact of the development on such heritage resources;
- An evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- The results of consultations with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;
- If heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- Plans for mitigation of any adverse effects during and after the completion of the proposed development.”

The NHRA makes provision for two forms of protection, formal and informal, and sets up a three tier system of formal protection as:

1. Grade 1 or National Heritage Sites managed by SAHRA.
2. Grade 2 or Provincial Heritage Sites managed by HWC.
3. Grade 3 or Local Heritage Sites managed by the Local Authority.

Generally protected sites include:

- Human burials older than 60 years.
- Archaeological and palaeontological sites.
- Shipwrecks and associated remains older than 70 years.
- Structures older than 60 years.

### 3.3.4 PGWC Guideline for Involving Heritage Specialists in EIA Processes (Edition 1, June 2005)

#### Principles and Concepts

Continuing on from the NHRA (1999), this now legally adopted Provincial Guideline further records (p 3): “Types of heritage resources as defined in the relevant legislation may include the following:

- Places, buildings, structures and equipment of cultural significance
- Places to which oral traditions are attached or are associated with living heritage
- Historical settlements or townscapes
- Landscape and natural features of cultural significance
- Geological sites of scientific or cultural importance
- Archaeological and palaeontological sites
- Graves and burial grounds
- Sites related to the history of slavery (NHRA).”

These are the so-called “tangibles” of the heritage concept (p 5). Thus the “cultural landscape” is seen as having a range from Archaeology to Palaeontology to Historical Architecture to Social History to Public Memory and Natural Landscape (p 6).

#### Environmental Context for Specialist Input

Determining heritage context in terms of layering uses the following broad formative layers. The following table provides a brief description of the environmental context for heritage specialist input in the Western Cape. It relates to temporal, thematic and spatial aspects (see Figure 3-1).

The Western Cape is categorized by a temporal layering including a substantial pre-colonial, early contact and early colonial history as distinct from other regions. The following can be regarded as a useful categorization of these formative layers:	
<b>Indigenous:</b>	
<i>Palaeontological and geological:</i>	<ul style="list-style-type: none"> <li>• Precambrian (1.2 bya to late Pleistocene 20 000 ya)</li> </ul>
<i>Archaeological:</i>	<ul style="list-style-type: none"> <li>• Earlier Stone Age (3 mya to 300 00ya) (ESA)</li> <li>• Middle Stone Age (c 300 000 to 30 000 ya) (MSA)</li> <li>• Later Stone Age (c 30 000 to 2000 ya) (LSA)</li> <li>• Late Stone Age Herder period (after 2000 ya) (LSA - Herder period)</li> <li>• Early contact (c 1500-1652)</li> </ul>
<b>Colonial:</b>	<ul style="list-style-type: none"> <li>• Dutch East India Company (1652-1795)</li> <li>• Transition British and Dutch occupation (1795-1814)</li> <li>• British colony (1814-1910)</li> <li>• Union of South Africa (1911-1961)</li> <li>• Republic of South Africa (1962-1994)</li> </ul>
<b>Democratic:</b>	<ul style="list-style-type: none"> <li>• Republic of South Africa (1994 to present)</li> </ul>
It is also useful to identify specific themes, which are relevant to the Western Cape context. These include, <i>inter alia</i> , the following:	<ul style="list-style-type: none"> <li>• Role of women</li> <li>• Liberation struggle</li> <li>• Victims of conflict</li> <li>• Slavery</li> <li>• Religion</li> <li>• Pandemic health crisis</li> <li>• Agriculture</li> <li>• Water</li> </ul>
Specific spatial regions also reveal distinct characteristics, which are a function of the interplay between biophysical conditions and historical processes. Such broad regions include the following:	<ul style="list-style-type: none"> <li>• West Coast</li> <li>• Boland</li> <li>• Overberg</li> <li>• Karoo</li> </ul>
A large number and concentration of formally protected Grade 1, 2 and World Heritage Sites, also characterize the Western Cape. Such sites include:	<ul style="list-style-type: none"> <li>• Table Mountain National Park</li> <li>• Robben Island</li> </ul>

Source: DEA&DP Guideline for Involving Heritage Specialists in EIA Processes (p 13).

Figure 3-1: Environmental Context for Heritage Specialist Input in the Western Cape.

### Triggers for Specialist Input

"A 'trigger' means a characteristic of either the receiving environment or the proposed project which indicates that heritage is likely to be a 'key issue' and may require the involvement of an appropriately qualified and experienced specialist.

"The primary legal trigger for identifying when heritage specialist involvement is required in the EIA process is the NHR Act. The Act identifies what is defined as a heritage resource, the criteria for establishing its significance and lists specific activities for which a heritage specialist study may be required (see Figure 3-2).

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- The construction of a bridge or similar structure exceeding 50m in length;
- Any development or other activity which will change the character of the site;
- Exceeding 5000 m<sup>2</sup> in extent;
- Involving three or more existing erven or subdivisions thereof;
- Involving three or more subdivisions thereof which have been consolidated within the past five years;
- Costs of which will exceed a sum set in terms of regulations by SAHRA or HWC;
- The rezoning of a site exceeding 10 000 m<sup>2</sup>;
- Any other category of development provided for in regulations by SAHRA or HWC

Source: DEA&DP Guideline for Involving Heritage Specialists in EIA Processes (p 16).

Figure 3-2: Categories of development listed in Section 38 (1) of the NHR Act.

Categories triggering HIA are as follows: “If the heritage authority is of the opinion that a heritage resource will be affected by a development listed in Section 38 (1) of the NHR Act, a heritage assessment is likely to be required either as a stand-alone HIA or as the heritage specialist component of an EIA.

“While the NHR Act specifically makes provision for heritage assessments for certain categories of development, heritage specialist involvement can also be requested by environmental and local authorities in terms of the provisions of ECA and NEMA. This may be the case where development is within a sensitive heritage context, e.g. a designated Urban Conservation Area in terms of Section 108 (Zoning Scheme).”<sup>3</sup> While the NHR Act specifically makes provision for heritage assessments for certain categories of development, heritage specialist involvement can also be requested by environmental and local authorities in terms of the provisions of ECA and NEMA. This may be the case where development is within a sensitive heritage context, e.g. a designated Urban Conservation Area in terms of Section 108 (Zoning Scheme). This extensive list of sites include Grade I-III, National and Provincial Heritage Sites and Protected Areas, as well as Provisionally Protected Sites, Urban Conservation Areas, Nature Reserves, proclaimed Scenic Routes, etc as well as World Heritage Sites e.g. Robben Island and Cradle of Humankind (Sterkfontein). A very large list of landscapes is also included starting with Scenic/Historical Routes or Landscapes, Pristine Natural Areas e.g. Cedarberg and many other types of landscapes including Historic Farm *Werfs* e.g. *Boschendal*, *Morgenster*, *Alphen*, and historical farmlands e.g. Winelands, Swartland, Karoolands, and many more.

<sup>3</sup> DEA&DP Guideline for Involving Heritage Specialists in EIA Processes (p 16).

<p><b>Category 1: Formally protected heritage sites</b></p>	<p>This includes formally protected heritage sites in terms of NHR Act, LUPO or other relevant legislation. This includes National Heritage Sites (Grade 1), Provincial Heritage Sites (Grade 2), Protected Areas (Grade 1 or 2), Heritage Areas, sites listed in the Provincial Register (Grade 3) and Provisionally Protected Sites, Urban Conservation Areas, Nature Reserves, proclaimed Scenic Routes, etc. It also includes World Heritage Sites, e.g. Robben Island and Cradle of Humankind (Sterkfontein). Depending on the nature of the development within these contexts, this would more than likely require specialist heritage input at an early stage in the EIA process.</p>
<p><b>Category 2: Landscapes of recognized or potential significance or sensitivity (not yet formally protected)</b></p>	<p>The landscapes below are informed by UNESCO and NHR Act landscape typologies. They include the following:</p> <ul style="list-style-type: none"> <li>• Scenic/historical routes or landscapes.</li> <li>• Pristine natural areas, e.g. Cederberg</li> <li>• Landscapes with unique geological or palaeontological history, e.g. the Great Karoo</li> <li>• Landscapes characterised by rocky outcrops, shorelines, dune field conditions where a range of archaeological sites including shell middens and fish traps could be located.</li> <li>• Uncultivated landscapes of the arid areas that contain undisturbed archaeological sites.</li> <li>• Relic landscapes with evidence of past now discontinued human activities,</li> <li>• Historical townscapes, e.g. Arniston coastal resort, Mossel Bay harbour town.</li> <li>• Mission settlements, e.g. Blim and Genadendal</li> <li>• Burial grounds and grave sites; i.e. older than 60 years.</li> <li>• Landscapes containing concentrations of historical structures; i.e. older than 60 years</li> <li>• Landscapes with potential for archaeological and palaeontological sites; i.e. containing remains of human activity older than 100 years.</li> <li>• Landscapes with maritime archaeological potential, including shipwrecks older than 70 years</li> <li>• Landscapes associated with displacement/contestation, e.g. Protea Village, "Trojan Horse" site, Langa Pass Office in Cape Town.</li> <li>• Landscapes associated with an historic event/person or grouping, e.g. Battle of Blaauwberg.</li> <li>• Landscapes associated with living heritage, e.g. use of indigenous vegetation within the Table Mountain National Park for medicinal purposes by traditional healers</li> <li>• Historical farm werfs e.g. Boschendal, Morgenster, Alphen</li> <li>• Historical farmlands e.g. Winelands, Swartland, Karoolands</li> <li>• Institutional landscapes, e.g. Drakenstein Prison, Valkenberg Hospital, Somerset Hospital</li> <li>• Designed landscapes, e.g. planned labourers village of Langquedoc, Company Gardens</li> <li>• A range of heritage resources could occur within these contexts.</li> </ul>
<p><b>Category 3: Resilient contexts with the potential to accommodate substantial modification</b></p>	<ul style="list-style-type: none"> <li>• Highly transformed contexts where there is some evidence of past human activity and which have potential for rehabilitation/regeneration.</li> <li>• Urban environments of poor environmental quality.</li> <li>• Degraded landscapes due to extensive land transformation, which has obliterated physical traces of past human occupation and which have low aesthetic value, e.g. quarries, land fill sites, utility corridors.</li> <li>• Undeveloped land within a defined urban edge, e.g. an infill site or site designated for urban development purposes. This context can be contrasted with a greenfield site.</li> </ul> <p>In such contexts, it is unlikely that detailed heritage specialist input would be required.</p>

<b>Factors influencing the sensitivity of the heritage context</b>	<p>There are a number of factors influencing the sensitivity of a heritage context and thus the nature and intensity of assessment. These include the following:</p> <ul style="list-style-type: none"> <li>• Pristine/greenfield versus modified conditions</li> <li>• Intact versus damaged or disturbed conditions</li> </ul> <p>Reversible versus irreversible past damage; i.e. rehabilitation/restoration potential</p> <ul style="list-style-type: none"> <li>• Degree of contestation; i.e. wide variation in values attached to a heritage resource, potential conflict between value systems.</li> <li>• Degree of significance; i.e. representivity, rarity, authenticity, intactness, etc</li> </ul>
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Source: DEA&DP Guideline for Involving Heritage Specialists in EIA Processes (p 18).

**Figure 3-3: Categories of Heritage Significance/Sensitivity to inform whether or not Heritage Specialist involvement is required.**

This long list has been ordered into twelve types of Heritage Context in Table 1 (pp 21-27), namely:

- Palaeontological landscape
- Archaeological landscape
- Historical Built Urban landscape
- Historical Farmland
- Historical Rural Town
- Pristine/Natural landscape
- Relic landscape
- Burial Ground and Grave Site
- Associated landscape
- Historical Farm Werf
- Historical Institutional landscape
- Scenic/Visual Amenity landscape.

Many of these could be grouped under the broad term Regional Cultural Landscapes (p 31). Thus the Landscape is considered an integral component of Heritage Resources. As a heritage resource, Landscape or Cultural Landscape is a contextual concept and cannot be seen in isolation from the surrounding environment.

Endorsed in November 2005 is the most relevant document that now guides HIA in the Western Cape. It is a highly useful document and has been used to guide this report. They note in the Introduction (p 1) that:

The overall purpose of heritage specialist input is to:

- Identify any heritage resources which may be affected;
- Assess the nature and degree of significance of such resources;
- Establish heritage informants/constraints to guide the development process through establishing thresholds of impact significance;
- Assess the negative and positive impact of the development on these resources;
- Make recommendations for the appropriate heritage management of these impacts.

Heritage Management Principles and Concepts derived from international charters in the absence of a South African charter on heritage are given as (bold added): "need to acknowledge a range of heritage values; need for **integrated, inclusive and holistic approaches**; respect for **historical layering**; understanding of the concept of **cultural landscapes**; respect for **vernacular/local identity and distinctiveness**; **public consultation**; **authenticity and integrity**; **multidisciplinary approach**; respect for **context and scale**; positive role for **enabling development**; need for **education and training**; respect for **intangible elements of heritage**; respect for **living heritage**" (pp 3-4).

### 3.4 Administrative Framework

#### 3.4.1 Western Cape Provincial Urban Edge Guideline (DEA&DP December 2005)

This document makes wide (14) mention of heritage resources recommending for cultural/heritage resources: "Wide buffer to allow meaningful experience of the resource."

#### 3.4.2 Stellenbosch SDF (2007)

An extract of the Stellenbosch SDF is shown below showing the location of the site. It shows the site located on the R304 just above Koelenhof. In the plan of December 2007 the site occurs just outside the northern boundary of the urban edge of Koelenhof.

The Stellenbosch SDF shows that Calcutta 29 occurs in the **hatched tan area** = Agriculture (Transition) Bioregional Planning Zone which covers most of the region in the West and NW of the Stellenbosch municipal area. Numerous riverine courses are also indicated as long green lines and one Buffer Zone = light green hatch near the Red Star.

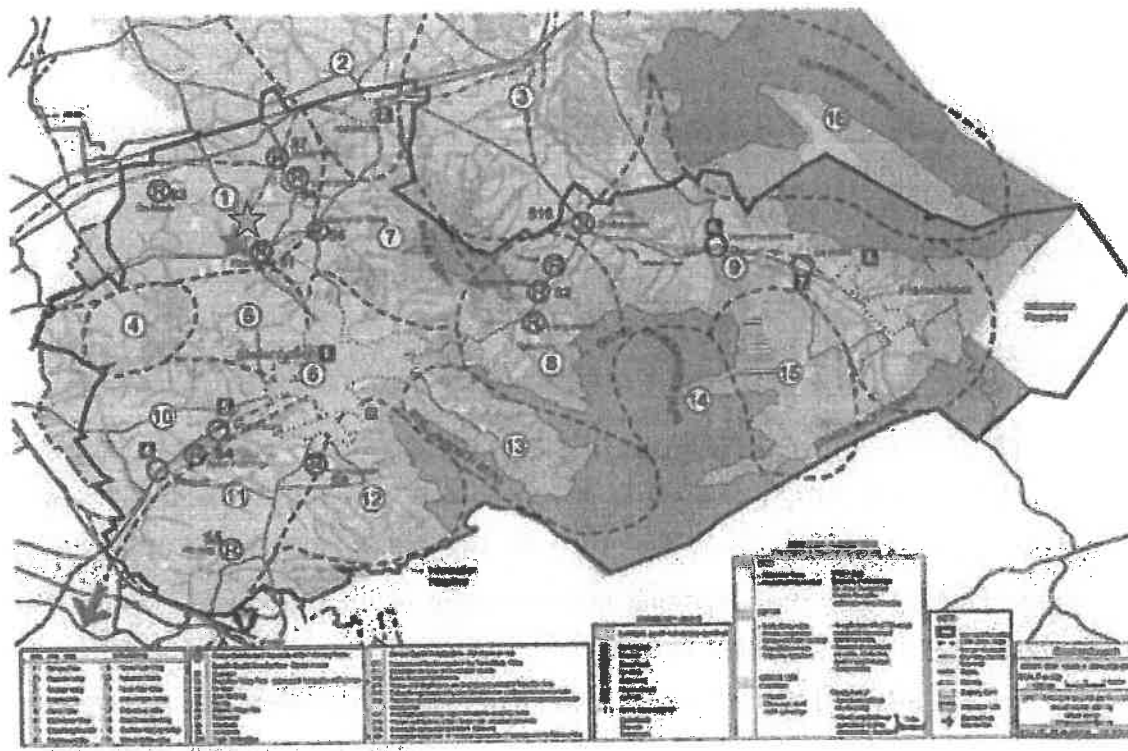


Figure 3-4 Stellenbosch Municipal Spatial Development Framework

City of Stellenbosch Planning and Design CC  
 Stellenbosch Planning, Landscape Architecture, Urban Design

23

Stellenbosch SDF 1997  
 December 2007

Source: Reproduced courtesy of CNdV Africa Planning and Design CC.

Figure 3-4: Stellenbosch Municipal SDF (2007) showing the site location (yellow star above red star).

The Stellenbosch SDF (p 9) *Synopsis: Heritage* notes the following (bold added):

#### HERITAGE

The sense of place of the Stellenbosch region is derived from a long agricultural and academic history coupled with well-preserved architecture and endemic biodiversity. Uncontrolled expansion of urban areas and industrialised agriculture into indigenous ecosystems threatens the unique fabric of the region, and may diminish the appeal of the area. **Several specific principles are proposed to protect the character of the area, including the use of guidelines for sensitive biodiversity areas, controls over building heights and architectural styles along major roads, and the determination of appropriate land use zoning according to view sheds.** The character of the rural area should be protected via various guidelines such as setting buildings along provincial roads back by at least 100m. Tourism that reinforces the municipality's sense of place should be encouraged and attractions should be developed that remain appropriate to the region's well-established themes.

Following the principles introduced in Section 2, Section 3 considers the 14 nodes that have been identified as the loci of future development in Stellenbosch Municipality in more detail. This includes a summary of the challenges and opportunities faced by each node and maps of the status quo and proposed developments that indicate how this could be translated into



more detailed spatial plans. Table 1 on page 12 summarizes the key infrastructure capacity issues that need to be addressed in each of the nodes, and can be used to prioritize infrastructure investments across the municipality in the short term.

Furthermore, *Section 7: Heritage* (pages 32-33) later notes more completely (bold added):

## 7. HERITAGE

Stellenbosch's sense of place is derived primarily from its historic architecture, endemic biodiversity and the views from its main arterial routes. Its main attractions include wine farms, natural areas, historic sites and museums, sports and recreational facilities, and tight-knit urban street character in many of the historic urban cores (e.g. Stellenbosch, Franschhoek). Approximately 169,000 tourists visited the municipality's tourism bureau in 2005, of which over 80% were foreign. Growth in domestic tourism is seen as an opportunity to expand the tourism economy. The establishment of Stellenbosch 360 in 2012 clearly marks the start of a new era in tourism promotion and business involvement in development in general.

Stellenbosch is home to some of the rarest and most diverse vegetation on earth, but this is coming under pressure from the uncontrolled expansion of urban areas and industrialized agriculture into indigenous ecosystems. As pockets of untouched ecosystems get smaller and the spaces between them get wider, they lose their ability to function and reproduce, and species become extinct. Combined with climate change, uncontrolled conversion of rare ecosystems could result in the loss of beneficial ecosystem services and significantly diminish the appeal of the area unless decisive action is taken to protect and nurture endemic biodiversity.

There is increasing importance of telecommunications to the growth of the economy. This is especially the case in Stellenbosch that has a strong emphasis on business services and information communication technology. Rapid expansion of the telecommunications industry in recent years has resulted in an increasing demand for radio telecommunication services, and new technologies in the cellular phone industry. The location, siting and development of TMI continues to be an issue of particular interest to both local communities and local government alike, with debate focusing on adequate availability of connectivity, visual amenity and public health. With the nature of technology it must be accepted that the future need for TMI sites will increase in the short to medium term.

### PRINCIPLES

- Sensitive biodiversity areas should be mapped, and clear and appropriate guidelines introduced to conserve them.
- Crest lines should be kept free of buildings and intensive agriculture to protect biodiversity.
- Ridge lines should be used for properly managed walking trails to increase recreational potential, tourism and income.

- The boundaries of view sheds along major routes should be determined by a visual resource management exercise.
- Land within these view sheds and outside of existing or proposed settlement nodes should be classified as either "Buffer" or "Intensive Agriculture" Spatial Planning Categories (SPCs) depending on the underlying land's suitability and use.
- Development for agricultural or agri-tourism activities within these view sheds and outside of existing or proposed settlement nodes should be limited to 1 du per 10 ha (or equivalent).
- Buildings along provincial roads should be set back at least 100m from these roads to preserve the character of rural areas.
- Building heights and architectural styles should be controlled within 200m of any prominent road so as to preserve the heritage of the built environment.
- Outside of formal conservation areas, land owners should be encouraged to conserve vegetation classified by SANBI as Endangered or Critically Endangered (particularly along ridge lines) and to link to existing conservancies (e.g. through the Cape Nature Stewardship Program). These land uses should be classified in the Core SRC.
- Adopt a telecommunication mast infrastructure policy that will facilitate the growth of new and existing telecommunications systems and facilitate the provision of TMF in an efficient, cost-effective, environmentally-appropriate and sustainable way.
- Tourism that reinforces the municipality's sense of place (e.g. agri-tourism, wine tourism and eco-tourism) should be encouraged in the settlements and on rural land outside the urban edge.
- Variety in the region's tourism offerings should be preserved rather than focused on one unique resource (e.g. wine tourism), but attractions must remain appropriate to the region's tourism themes.
- Restaurants, wine tasting and holiday accommodation should be encouraged, but must be within the parameters of the rural housing guidelines and provincial resort guidelines.

The location of the Calcutta site is just north of the 1km urban boundary on the road to Cape Town and the N2 (see Figure 3-5). Nothing is planned outside Koelenhof around Calcutta 29 leaving it rural-agricultural. Its heavily wooded nature is distinctive in the otherwise open agricultural field landscape.



Figure 3-5: Koelenhof SDF study area (2007) showing the site location (yellow star).

The Koelenhof proposals do not affect the *Calcutta 29* site.

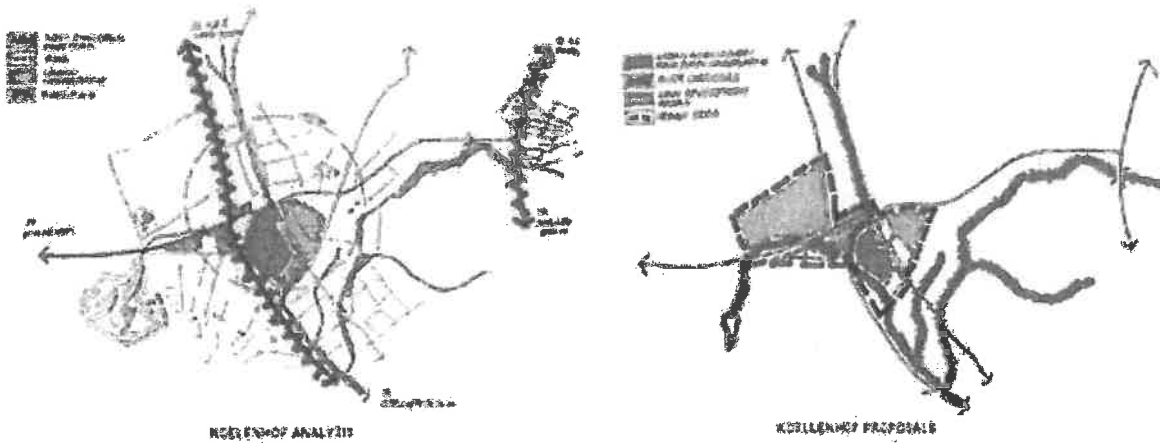


Figure 3-6: 3.9 Koelenhof Analysis and Proposals (Stellenbosch SDF 2007:55).

NWA

## 4 Heritage Environment

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### 4.1 Summary

The farm *Calcutta 29* lies 10km NW of Stellenbosch on the R304. The property is covered with immature gum plantation and stands out from the open farm fields of the area. Elsenburg Agricultural College lies just east of the site and numerous wine farms are found in the general area but only a few locally. The property is owned by Stellenbosch Municipality and was previously Crown Land. The *Calcutta Outspan* has significant local landmark and associative heritage significance and both the property Landscape Unit and Heritage Site itself are graded IIIb. Nearby Elsenburg's 4 heritage sites and landscape unit are graded II, IIIa and IIIc, while Simonsig is also graded IIIc. No significant palaeontological or archaeological remains were uncovered during field inspections. The most tangible heritage feature of the environment is landscape.

### 4.2 Introduction

Combined with Section 2, this chapter presents the relevant heritage information required for HIA. This is a strongly historical chapter well illustrated with maps, plans and photographs. Heritage impact is all about our appreciation of the past as an inheritance of tangible and intangible elements. This chapter records what we know about the affected environment's heritage.

#### 4.2.1 Background

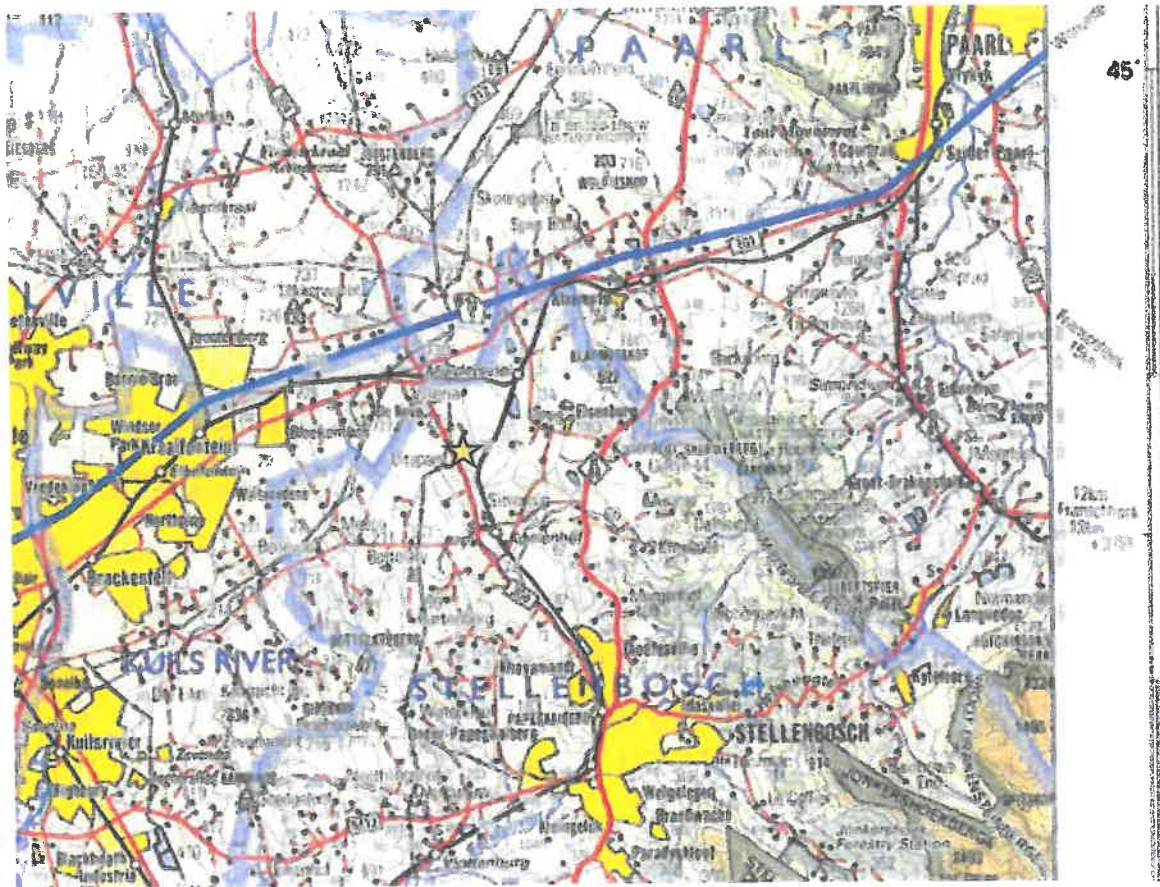
The description of the environment is undertaken with a view to presenting basic information for the Heritage Impact Assessment.

#### 4.2.2 Key Issues

1. *Calcutta 29* lies 10km NW of Stellenbosch on the R304 just north of Koelenhof in the Stellenbosch Winelands.
2. The property is rural, zoned Agricultural, and lies just west of Elsenburg Agricultural College.

3. The land is largely flat and covered with immature gum plantation of mixed ages, invaded, in places heavily, with alien Acacia.
4. The landscape is generally scenic in a mixed agricultural setting against the backdrop of the Stellenbosch Mountains.
5. The area is marginal to the Stellenbosch Winelands but still contained within them. More pasture can be found here although there are some vineyards.
6. **The local Landscape Unit: A11 Calcutta and wider open fallow land has already been graded Grade IIIb by the Stellenbosch Heritage Survey and Management Plan (2018), as has the Calcutta Outspan IIIb site on the property's southern tip.**
7. **Graded Landscape Units** to the east around Elsenburg are Grade IIIa; while areas further east and south are graded Grade II.
8. **Graded Heritage Sites nearby include: Elsenburg Pluimvee Proefplaas IIIa, Elsenburg x2 II, Elsenburg Pear Grove IIIc; Simonsig IIIc.**

### 4.3 Location



Source: Reproduced by permission of the Chief Directorate: Surveys and Mapping, State Copyright 2000.

**Figure 4-1: Regional Context.**

Portion of a 1:250,000 map of South Africa showing the site's location (3318 Cape Town, 9th Edition 2000). NTS.

The site occurs near Koelenhof between Stellenbosch, Kraaifontein and Paarl adjacent to the R304. *Uitspan* is noted to the left of which the Calcutta 29 portion once formed a part. Its gum trees stand out from the surrounding countryside, which tends to be open fields and vineyards. The R304 connects Stellenbosch and Malmesbury directly. A railway line also follows the R304 to the east but veers off to the NE just south of the site in the direction of Klapmuts.

### 4.4 Natural Environment

#### 4.4.1 Topography

The site is basically flat but falls away to the east where the adjacent river flows. The area's backdrop is dominated by the Hottentot Holland Mountains in the distance with Simonsberg in the mid distance. A small river tributary is shown running through the site.

#### 4.4.2 Vegetation

The vegetation on site is mostly artificial and derived from agricultural activities, gum plantation, not too old (perhaps less than 10 years) and, presumably, a history of pasturage previously, if the adjacent southern site is anything to go by.

### 4.5 Social Environment

#### 4.5.1 Land Use

The site and general area is currently zoned Agricultural.

#### 4.5.2 Rural Context



Source: Reproduced by permission of the Chief Directorate: Surveys and Mapping, State Copyright 2000.

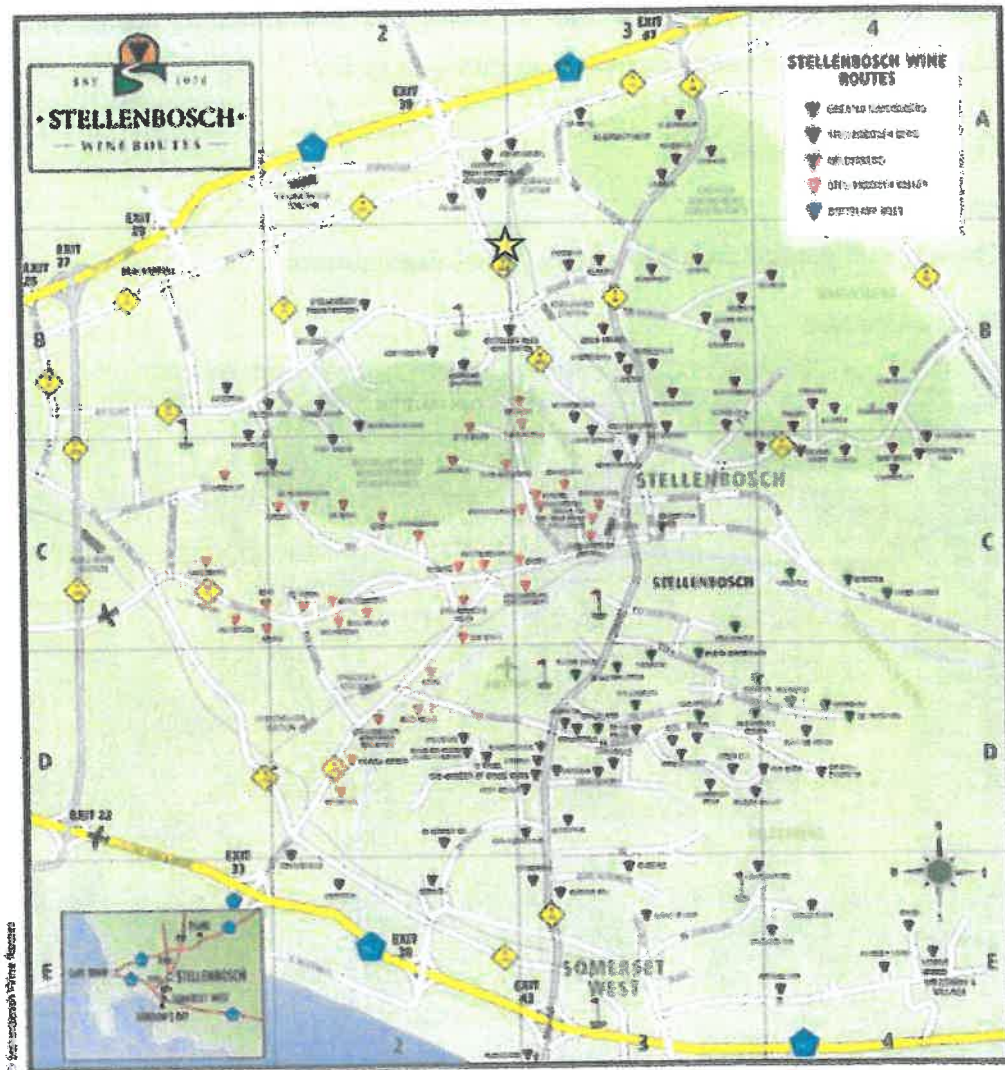
**Figure 4-2: Rural Context.**

Portion of a 1:50,000 map of South Africa showing the site's location (3318 DD Stellenbosch, 5th Edition 2000). NTS.

The site lies in an extensive area of farmland in the NW region of the Stellenbosch Winelands. There are numerous well-known wine farms in the area. Elsenburg Agricultural College lies to the east of the site over the railway line.

## 4.6 Cultural Environment

### 4.6.1 Cultural Landscape



Source: Stellenbosch Wine Routes.

**Figure 4-3: Stellenbosch Wine Routes (June 2017).**  
Stellenbosch Wine Route Map (June 2017) showing the entire Stellenbosch area.

The Cape Winelands are world renowned and are a UNESCO World Heritage Site. The development of the Winelands into a cultural landscape occurred historically during the colonial period of South Africa from the seventeenth to nineteenth centuries. The twentieth century saw expansion and further development of the winelands and the development of the region's famous Wine Routes. There are numerous well-known Stellenbosch wine farms in the area including *Koelenhof* and *Simonsig*. As such this rural landscape is highly transformed with farms either given over to vineyards or pasturage. There are also numerous farm dams.



*Calcutta 29* occurs in the NW portion of the area falling between the **Bottelary Hills Wine Route** and the **Greater Simonsberg Wine Route**. While there are no major wine farms noted in the immediate area on the map, which shows *Simonsig* and *Villiera* as the two nearest wine farms. However, *Villiera* does occur very near the site and not as indicated on the map. *Vrede* also occurs nearby and *Koelenhof*.

The natural landscape is typically transformed from the fynbos and renosterveld that naturally occurs in the area. Most of the visible landscape appears to be either a degraded type of grassland for pasturage or vineyards with some gum plantations and avenues in the general area. While much of the area is gently rolling, this particular area is relatively flat forming part of the Joostenberg or Krom River Vlakte/Flats of the local wetlands.

Popular activities in the area are primarily associated with visiting and touring the winelands and their farms, although the area is also highly scenic and there are various scenic routes in the area. This particular stretch of the R304 is rather ordinary. Many farms have overnight accommodation for tourists.

#### 4.6.2 Visual and Aesthetic Environment

As noted above, the Winelands are world famous and generally situated in a highly scenic region. This particular area is a highly transformed agricultural landscape with numerous vineyards, pastures and occasional farmsteads, hamlets and other agricultural buildings.

The site itself used as a gum plantation with mostly young, possibly regrowth/*opslag* gums near the R304. The aerial photographs show older trees deeper in the site, while immediately to the south there is a particularly scenic piece of rolling countryside with scattered mature European Oaks.

The R304 is a very busy road and traffic along it occurs at high speed on this rather straight stretch making the properties along the road rather prone to its high speed feel and a sense of danger and noise from speeding cars and trucks.

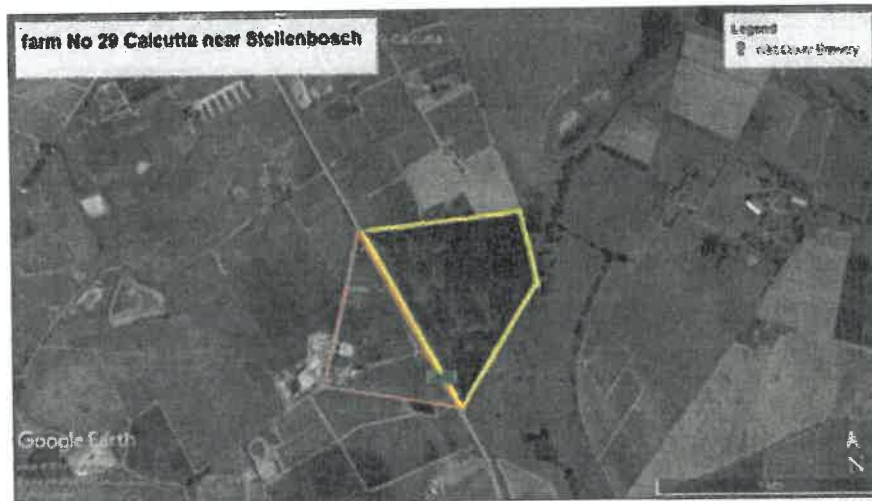
To the rear or east of the site and not obvious/visible from the R304 are various local scenic routes around Elsenburg as shown in the Stellenbosch Municipality Heritage Survey (2018).

## 4.7 Heritage Environment

### 4.7.1 Historical Context<sup>4</sup>

#### Introduction

The farm No 29 “Calcutta”, Stellenbosch is situated some 10km to the north west of the historical town of Stellenbosch along the R304. The basic co-ordinates are approximately 33°51’11”S and 18°48’28”E (see Figure 4-4).



Source: Google Earth 2018/Dr Ute Seemann.

Figure 4-4: Google view, farm No 29 Stellenbosch, “Calcutta”.

The triangular orange marked property on the left of the road, the R304, the old – and the yellow marked the new proposed cemetery site.

The property is at present zoned ‘agricultural’. It is surrounded by a mixed use area: to the west the Cape Town suburbs and industrial areas of Kraaifontein and Bellville, to the north and north west small scale mixed farming properties, further to the east a small Boland town, Klapmuts and even further south the historic town of Stellenbosch with the domineering mountain background.

Traditional farmlands still dominate the vistas all round; and within a radius of less than 20km any number of historic wine estates<sup>5</sup> are situated. These together with sprawling suburbs still dominate the mental image of the Stellenbosch administrative district.

#### Historic Notes

Before Europeans reached Table Bay to settle permanently in 1652, two groups of indigenous people, the Khoi-San and the Khoi-Khoi herders peopled the Cape Peninsula and its *hinterland*. The Khoi kept fat-tailed sheep and indigenous cattle and adhered to a fixed

<sup>4</sup> Dr Ute Seemann (31 October 2018). Historical Background Report: The Farm 29 Stellenbosch “Calcutta”.

<sup>5</sup> Fransen, Hans. 2004. *The Old Buildings of the Cape*. Johannesburg and Cape Town: Jonathan Ball Publishers, pp 199-211.

yearly transhumance migration. Wagon routes followed these cattle tracks, and later contemporary roads may well have been constructed along the same routes.

Shortly after the founding of the outpost in Table Bay in 1652 the Dutch East India Company (VOC) committed itself to a permanent settlement policy. Some twenty years later the district and town of Stellenbosch were founded on the banks of the Eerste River. Fertile lands along this and several rivulets descending from the Hottentot Hollands Mountains had been allocated to VOC employees, who established prosperous vineyards. From historical maps it appears that the area under investigation has been continuously cultivated since then. Almost all material traces of the nomadic earlier inhabitants - the Khoi-Khoi - have therefore been obliterated.



Source: Fransen, Hans. 2006. *Old Towns and Villages at the Cape*, page 68.

Figure 4-5: Plan of Stellenbosch, dated to 1817.

The farm "Calcutta" would be located off map to the left as North is to the left while East is up.

The town of Stellenbosch was established in 1679, properly surveyed, the properties recorded in a locally held register.<sup>6</sup> The road from Cape Town, as well as the one to The Strand (now the R44) and the R304 to the north, have been landmarks since earliest times (see Figure 4-5).

#### Deeds Office and Surveyor General Records

The land on which "Calcutta", farm No 29 Stellenbosch is situated today was part of a "Crown Grant" to the town of Stellenbosch registered in about 1810, when a title deed regis-

<sup>6</sup> Fransen, Hans. 2006. *Old Towns and Villages of the Cape*. Johannesburg and Cape Town: Jonathan Ball Publishers, pp 65-75.

ter was introduced by the British colonial government, who had taken over the Cape of Good Hope from the Dutch. A “crown” grant was a certain piece of land, belonging to and yielding its revenues to the British “Crown”, i.e. the reigning monarch, and was not to be alienated without the British monarch’s consent.<sup>7</sup> After South Africa became a republic in 1910 “crown” land became the property of the state. Between 1925 and 1939 several small portions of this property were alienated for road-, power- and pipe line servitudes.

The remaining land was transferred to the Divisional Council of Stellenbosch on 12 August 1939 as the title deed register shows (see Figure 4-6).

Portion 1 of the farm No 29, Stellenbosch (27 morgen out of the original 74 morgen) was sold to Lucia Christine Jones (born Hattingh) MOCP (Married in Community of Property) on 14 February 1941.

The Divisional Council of Stellenbosch proposes to establish a cemetery on the property.

#### Heritage Resources According to the CTS Heritage Report

The heritage resources of Stellenbosch Municipality have recently been identified and assessed for heritage significance during a municipal-wide survey.

The site, farm No 29 “Calcutta”, Stellenbosch is described as having “... agricultural land character. The portion of land proposed for development forms the southern corner of the land unit and has an historic *outspan* area<sup>8</sup> that features a remnant plantation on a distinctive triangular-shaped piece of land called Calcutta Bos. This *outspan* has landmark and associative significance and is highly regarded by people living in the area.

Highlights of this land unit are the ... remnant Oak trees found on open fallow land and the small stream next to the historic *outspan* area. This landscape unit has historic and associative significance in an area with a valued rural quality, and any development will compromise its inherent rural character. As such, this heritage resource in particular has been graded as having Grade IIIb heritage significance.

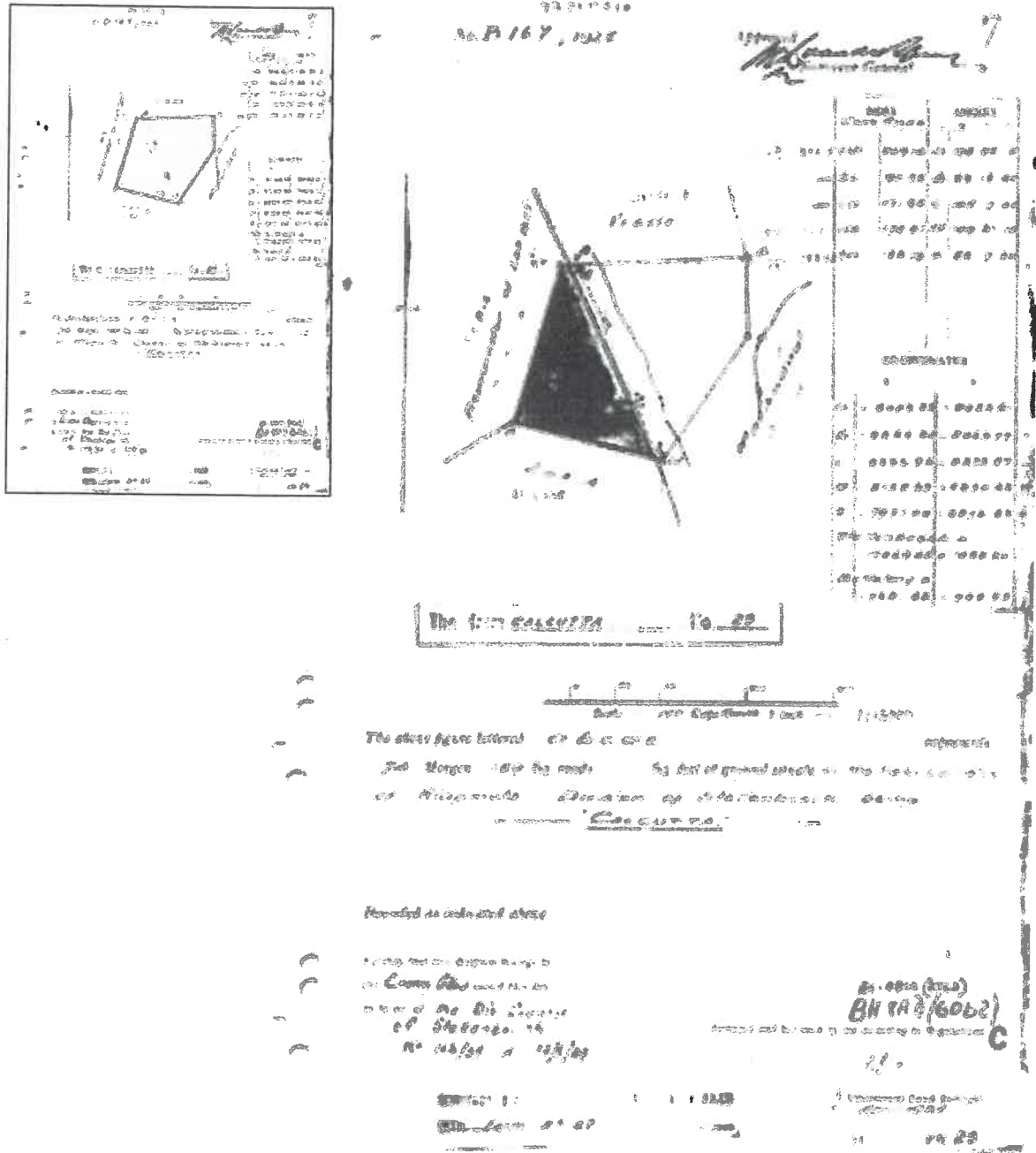
According to some historians, historically, places of *outspan* were often sites of contact between indigenous people and colonialists.... Some material remains from this time may be located beneath the soil surface.... Additionally, once *outspan* places were no longer essential to transportation in the region, they were often used for forestry, with some remnants of that activity on this site. The site therefore has historical, social and community significance.”

<sup>7</sup> An example of a well-known “crown” land (property) to this day is the Rondebosch Common in Cape Town.

<sup>8</sup> CTS Heritage (2018). *Heritage Screener, proposed development of a cemetery on Farm Calcutta No. 29, Stellenbosch*. Prepared for EnviroAfrica. Cape Town.

**Recommendation by CTS**

"Based on the available information, the proposed development is likely to impact on heritage resources and as such, it is recommended that a complete Heritage Impact Assessment is required that assesses impacts to archaeological resources and landscape character..."



Source: Surveyor General Cape Town, Survey Diagram 167/1925.

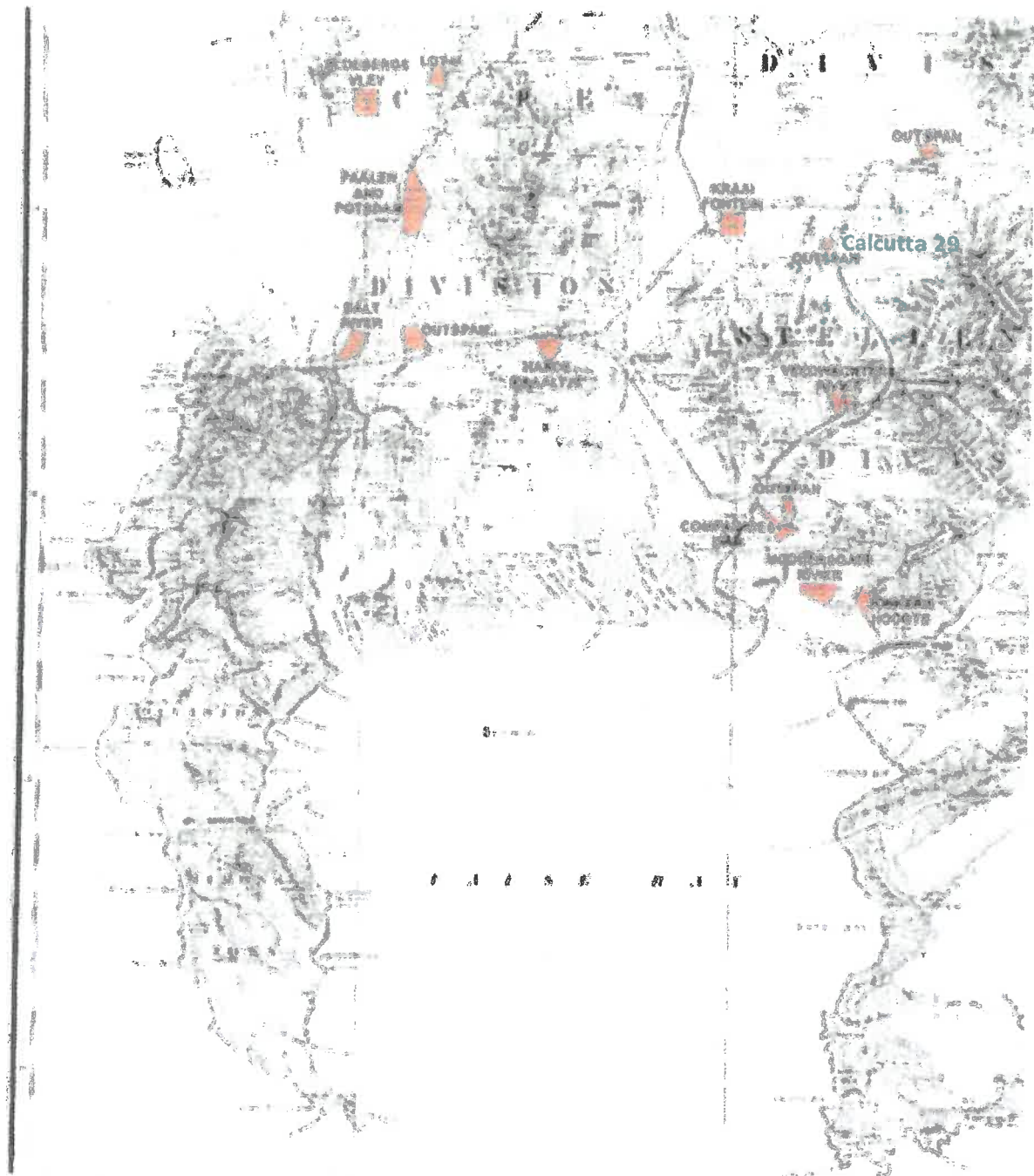
**Figure 4-6: The farm No 29, Stellenbosch, "Calcutta" Survey Diagram.**  
 Situated in the Field Cornetcy of Klappmuts, Division of Stellenbosch.

#### 4.7.2 The 1890 Survey Showing Outspan Sites

The 1890 Survey Maps undertaken in the latter part of the 19th century show the status quo of OUTSPAN sites in the Cape and Stellenbosch Divisions.

The network of outspans every 10-15km is still intact with three outspans shown north of Stellenbosch: **Kraai Fontein** near Kraai Fontein Station; one near **Klapmuts Station** outside Bennetsville; and the one on the road south to Stellenbosch near **Marion Dal**, then unnamed but later becoming *Calcutta 29*. Outspans are situated at regular intervals although the size of each varies. There are three main routes:

1. **North:** up the West Coast (today's N7 route).
2. **Northeast:** to the interior and Diamond Fields (today's N1 route).
3. **Southeast:** to the Boland, known as the Eastern Highway (today's N2 route).



Source: New World Associates.

**Figure 4-7: Outspans in the Cape and Stellenbosch Divisions (1890).**

Overlain on the 1890 Divisional Survey Map, all **OUTSPAN** sites are highlighted and named where a name is given; some are only referred to as **OUTSPAN** including the one on what would become known as *Calcutta 29*, SE of the **KRAAI FONTEIN** **OUTSPAN**.

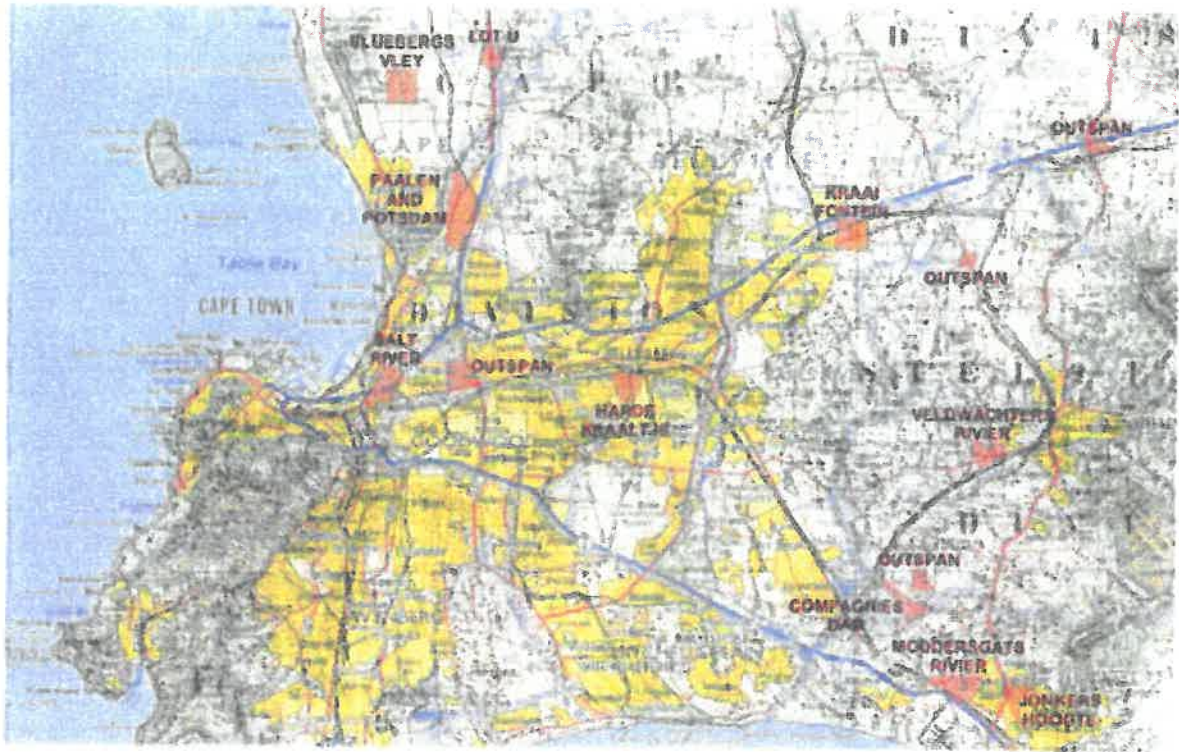
### The Outspan at *Calcutta 29*

There are various unnamed farms labelled alphabetically with *Calcutta 29's* outspan being situated between Lot A and Lot B west of *Marion Dal*. It is sited between two tributaries of the upper Plankenburg River providing ample water for livestock and human consump-





*Klapmuts, Calcutta 29 and Verwachter's Rivier* in the northern Stellenbosch district remain largely rural, as do the two at *Compagnies Dam* to the SW, while *Moddersgat* and *Jonkershoek* at Somerset West are now suburban.



Source: New World Associates.

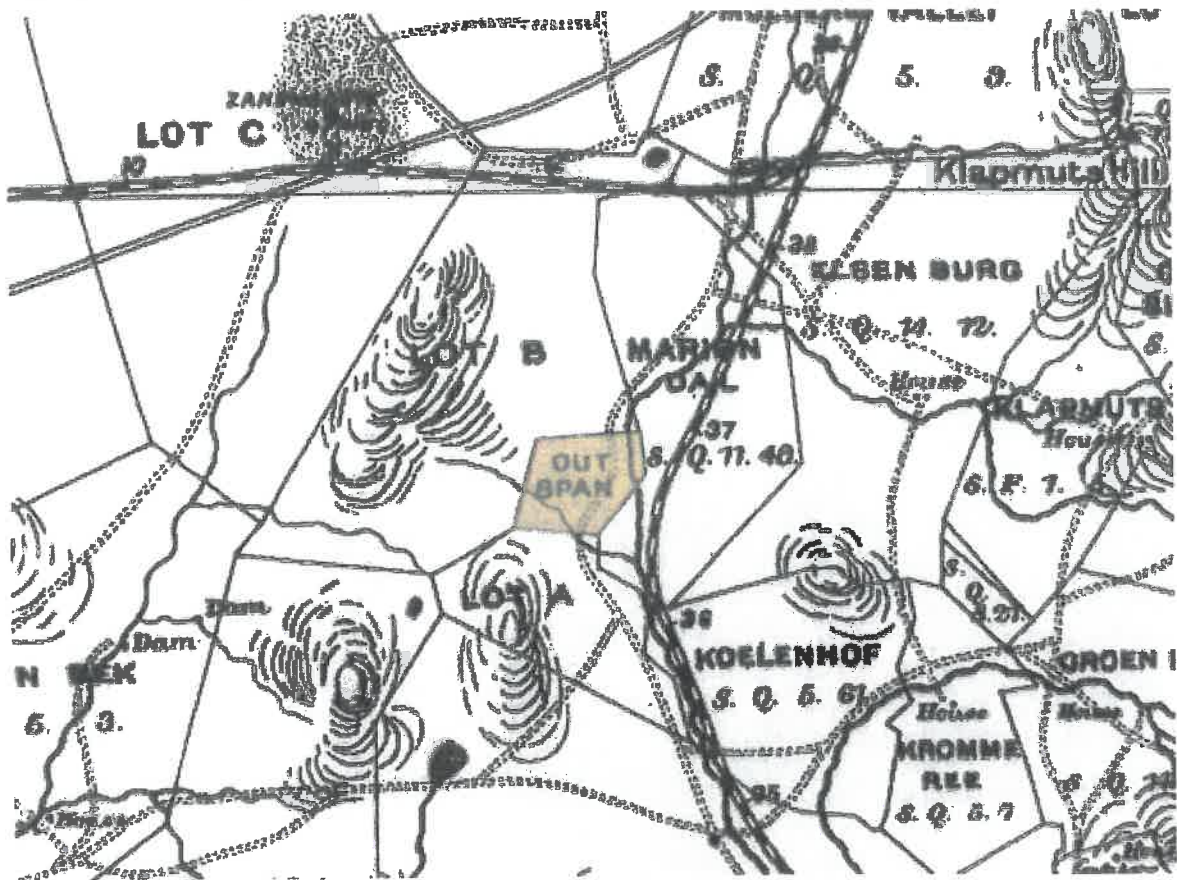
**Figure 4-9: Outspans in the Cape and Stellenbosch Divisions (1890) versus today (2000).**

Overlain on both the 1890 Divisional Survey Map and the 1:250,000 map (3318 Cape Town, 9th Edition 2000), all original 1890 **OUTSPAN** sites are shown as they relate to the 20th century (map overlay approximate only). The **KRAAI FONTEIN OUTSPAN** has become part of today's Kraaifontein, while the **KLAPMUTS OUTSPAN** now lies to the NE of today's Klapmuts. The **MARION DAL OUTSPAN** now is divided between Portion 1 west of the R304 and the remaining outspan site now used for gum lot to the east on *Calcutta 29*.

Overall, the suburban expansion of Cape Town, Bellville and Mitchell's Plain have stopped at the Winelands around Kuil's River, leaving the *Kraai Fontein Outspan* at the outer boundary of the Cape Town Metro with the *Calcutta Outspan* nearly 'midway' towards Stellenbosch. As a largely untransformed site still firmly situated in an agricultural area, the old *Calcutta/Marion Dal Outspan* retains much of its original character in that the area is not transformed to urban or any other land use. The main change being its planting for a gum plantation at a date unknown but probably late 20th century.

A review of the aerial photographs available from the 1940s onwards would show the changes but this has not been done yet. It would help complete the 20th century history of the site as it transformed from 19th century outspan to 20th century gum plantation. The

1890 map is the best plan available of its original condition showing its location and the track that once led through it. It may still be there hidden amongst the gum trees.



Source: Surveyor General Cape Town, Divisional Councils Survey (1890).

**Figure 4-10: Survey Plan Enlargement of the Division of Stellenbosch (1890).**

Calcutta 29 is diagrammed as **OUTSPAN** between KOELENHOF and MARION DAL. Portion 1 of 1949 forms the left/western triangle of the property, leaving Calcutta 29 to the east of today's R304. A track is shown running through the eastern portion towards MARION DAL and ELSEN BURG en route to the next outspan at BENNETSVILLE/KLAPMUTS. The outspan closer to Cape Town is at KRAAI FONTEIN.

#### 4.7.3 Stellenbosch Heritage Survey and Management Plan (SHS&MP) (2018)

Further information about the area generally can now be gleaned from this excellent survey recently completed and published online. It is referred to by abbreviation SHS&MP in this report. This is powerful and invaluable resource provides at long last an authoritative and comprehensive survey of heritage resources in this heritage rich municipality, making it easier to determine the heritage context of developments.

#### Appendix 1: An Archaeological, Archival, Oral and Spatial History

This appendix provides some useful background information on outspans. Initially, in the 18th century, outspans were informally in use around freehold properties, developing with time into rental/quitrent property. Few survived by the late 19th century, much public

land having been privatised. The situation of outspans had to be regular and they needed to provide both water and shade for the users, livestock and human alike.

#### 4.1.5 Early Freehold Land Grants<sup>9</sup>

In 1813 perpetual quitrents were introduced by the British government. The resulting flurry of land grants allocated during this period attests to how the open land surrounding freehold grants came to be more formally carved up. The so called 'open land' surrounding freehold properties had actually been informally used throughout the 18th century by farmers and as Company and public outspans, and as the 18th century had worn on it was increasingly utilized as rental or quitrent property. By the early 19th century increasing numbers of these quitrents became permanent leaseholds that could be purchased and transferred the same as freehold property.

##### 4.5.1 Outspans and Commonage, Wire Fencing and Wind Pumps

"The surveys of 1860-90 show the few outspans and doordrifts that still survived after the big disposal of Crown land earlier in the 19<sup>th</sup> century. State land was further privatised at the end of the century. The outspan at Franschoek remained intact until 1897 when a substantial portion was subdivided and sold.

Outspans were for travellers and drovers on the roads. The ox wagons travelled at between four and six kilometres per hour on the level. The traveller needed regular outspans with shade, water and grazing. These were usually provided 10 to 15km apart. In the early 19<sup>th</sup> century the faster horse-drawn carts and coaches started to replace the ox wagons and saddle horses. There was a call for better roads and a lesser demand for outspans. Outspans also accommodated animals in towns and villages, for example on market days or for churchgoers."

## Appendix 5: Landscape Character Study<sup>10</sup>

### Graded Landscape Units

SHS&MP's *Appendix 5: Landscape Character Study* is invaluable to appreciating the heritage significance of landscape sites such as that at *Calcutta 29*. The Stellenbosch Inventory divides the region up into various zones (see Figure 4-11).

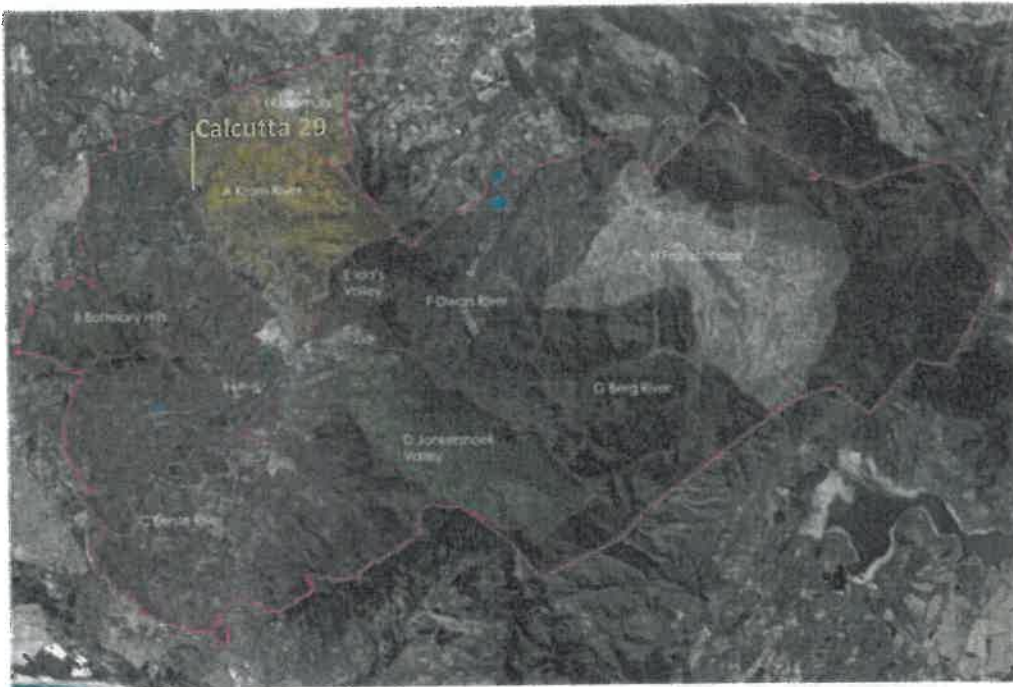
*Calcutta 29* occurs in the NW Landscape Character zone **A Krom River**. The site lies on its NW boundary with the next zone **B Bottelary Hills** (see Figure 4-12).

The grading of this area, on Landscape Units **A11 Calcutta and open fallow ground** and **A12 Cultivated Vineyards** is **Grade IIIb**, which abuts onto the **Grade IIb Landscape Unit: A09 Elsenburg**. Further east and south of Elsenburg, are **Grade IIa Landscape Units A14 Groenhof, Muratie and Knorhoek** and **A16 Gateway to Krom River**. With **Grade IIb**

<sup>9</sup> Antonia Malan (April, 2018). *Appendix 1: An Archaeological, Archival, Oral and Spatial History in Stellenbosch Heritage Survey and Management Plan (2018)*. Stellenbosch Municipality.

<sup>10</sup> Liana Jansen and Fabio Todeschini (2018). *Appendix 5: Landscape Character Study in Stellenbosch Heritage Survey and Management Plan (2018)*. Stellenbosch Municipality.

**A15 Skurweberg Foothslopes** in between. Land over the R304 to the west is not graded but zoned **NCW Land Parcels in the Stellenbosch Winelands** (see Figure 4-13).



Source: Appendix 5 in SHS&MP (2018).

Figure 4-11: Landscape Character Zones showing **Calcutta 29**.

**Calcutta 29** occurs in A Krom River zone and is clearly visible in its wooded character (to the left of the label A Krom River).

The Stellenbosch Municipality Heritage Inventory Map is shown in Figure 4-12 below.

#### Graded Heritage Sites

While there are numerous **Grade IIIc** sites in the Krom River Valley, there are also a number of **Grade IIb** sites. These are not named on the maps but have to be found on the interactive online map.<sup>11</sup> There are 4 sites at Elsenburg:

- **The nearest is Elsenburg Pluimvee Proefplaas, Grade IIIa**
- **Elsenburg itself, Grade II**
- **Immediately adjacent, Elsenburg Pear Grove, Grade IIIc**
- **Elsenburg, Grade II to the south.**

The nearest graded wine farm is:

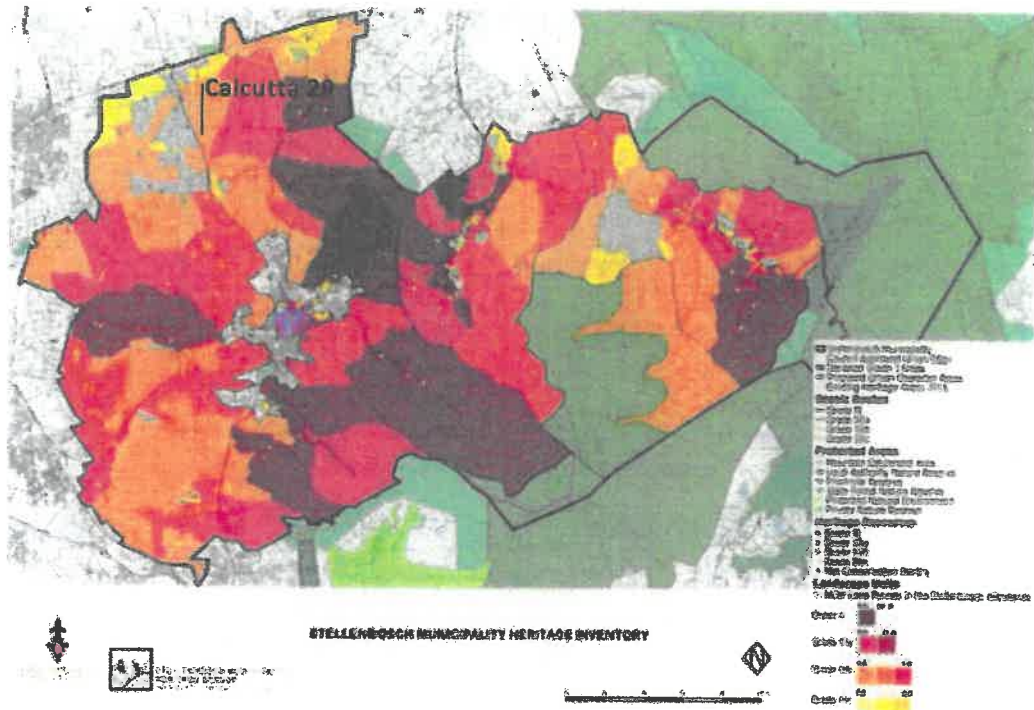
- **Simonsig, Grade IIIc.**

Ungraded resources over the R304 northwards include:

- **Wild Clover**
- **Pete's Adventure Farm Cottages**

<sup>11</sup> <http://stellenboschheritage.co.za/smhs/map/#13/-33.8508/18.8097>.

- **Koelenhof Wynkelder:**



Source: Appendix 5 in SHS&MP (2018).

Figure 4-12: Stellenbosch Municipality Heritage Inventory Map (2018).

This map shows the overall context of heritage sites and landscapes and their grading. **Calcutta and surrounds are ranked Grade IIIb.**

#### Graded Scenic Routes

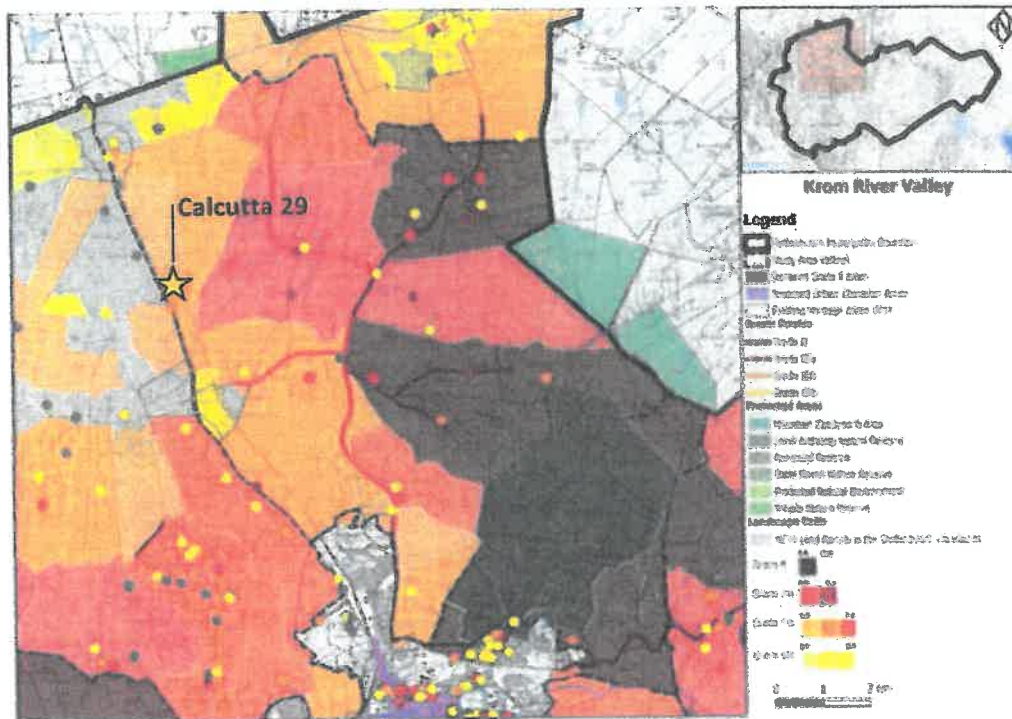
The R304 running on *Calcutta 29's* western boundary has no ranking as a scenic route, however, the network of roads to the east behind Elsenburg are given **Grade IIIa** and even **Grade II** rankings. They are not visible from the site.

#### Landscape Character Areas: Krom River Vlakte

The Landscape Character Zones of the SHS&MP are further divided into Landscape Character Areas. *Calcutta 29* falls into A11 Krom River Vlakte. They are described in the following extract from Appendix 5 (see Figure 4-14). While it is an area with “development potential” due to low overall grading, “some of its highlights include the Calcutta Outspan with attractive open fallow land and large remnant oak trees next to it (A11)” (ibid). They also note “it has expansive views back towards the Stellenbosch mountains” (ibid).

The Krom River Vlakte are mostly characterised by low undulating plains on the northern boundary of the Stellenbosch Municipal area. This landscape unit scored low in the evaluation process and presents an area with development potential. It is close to the N1 and has expansive views back towards the Stellenbosch mountains. Some of the highlights include the Calcutta outspan with attractive open fallow land and large remnant Oak trees next to it (A11).

The smaller blocks of well-maintained vineyards in land unit A12 are an important transition area into and out of the Stellenbosch winelands.



Source: Appendix 5 in SHS&MP (2018).

**Figure 4-13: Stellenbosch Municipality Heritage Inventory Map: A Krom River Valley (2018).** This map shows the overall context of heritage sites and landscapes in the Krom River zone and their grading. **Calcutta 29** is zoned as a **Grade IIIb Landscape with a Grade IIIb Heritage Site on the southern corner at the old Outspan site.** They are both ranked as 6 (medium orange), the mid Grade IIIb forming part of the grading of that area

A Krom River Landscape Unit Rating		Item Weight	Value	A11 Weighted value	A12 Value	A12 Weighted value	A13 Value	A13 Weighted value
Ecological	Protected areas: 10 Critical Biodiversity area 9 Ecological support areas 7 agriculture 4 Urban 1	20%	8	1.6	8	1.6	7	1.4
	Viewshed: Scene Diversity, enclosure unity colour, texture balance proportion form	20%	8	1.6	7	1.4	4	0.8
Historic	Age Pattern representivity and association rarity condition	25%	6	1.5	3	0.75	4	1
Social	Meaning and cultural associations Church School Creche recreational community	10%	3	0.3	3	0.3	5	0.5
Economical	tourism and agricultural potential High low suitability 9 medium low suitability 7 fragmented 5 Disturbed 2	25%	5	1.25	5	1.25	5	1.25
Degree of acceptable		100%		<b>6.25</b>		<b>5.3</b>		<b>4.95</b>

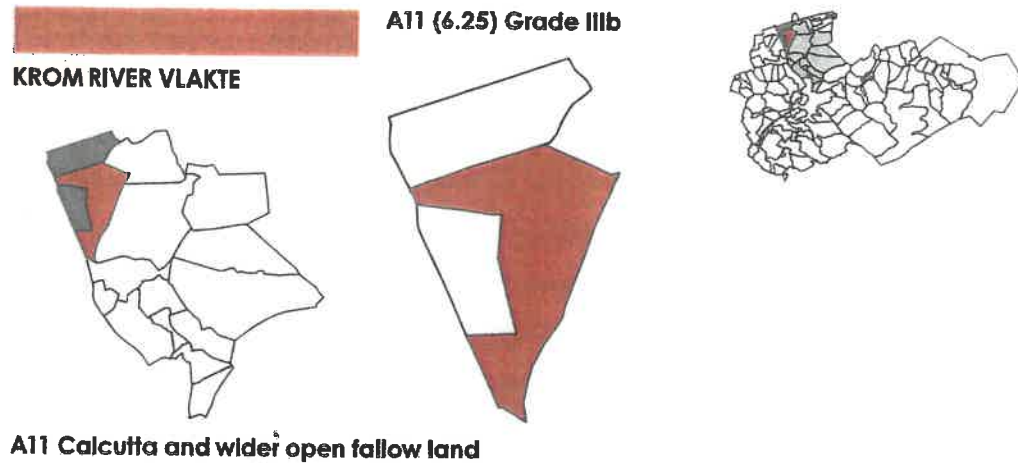
NCW	0-7	
Grade 3c	7 to 4.9	
Grade 3b	5 to 7.9	
Grade 3a	8 to 10	
Grade 2	8.5 to 10	

Source: Appendix 5 in SHS&MP (2018).

**Figure 4-14: Stellenbosch Municipality Heritage Inventory Map: Krom River Vlaktes (2018).** A11 Krom River Vlaktes scores 6.25 points = Grade IIIb.

#### A11 Calcutta and Wider Open Fallow Land

The specific detail for Calcutta is noted in unit A11 with the map area found below (see Figure 4-15).



Source: Appendix 5 in SHS&MP (2018).

Figure 4-15: Stellenbosch Municipality Heritage Inventory Map: A11 Calcutta etc (2018).  
A11 Krom River Vlaktes scores 6.25 points = Grade IIIb.

The description of A11 Calcutta and surrounds is as follows (**bold added, ibid**):

#### **A11 Calcutta and wider open fallow land**

An active railway line and Muldersvlei station are located in the northern section of this landscape unit with another railway line forming the eastern border. Its presence, however, does not have an adverse impact on the rolling, fallow agricultural land character of most of the unit. The R101 represents the northern border, and two businesses are located along it. The Giraffe House on the corner of the R101 and R310 features some small camps with wild animals such as giraffe, ostriches and antelope species. It has a negative influence on the visual character of the area. A chicken farm is located adjacent to this property. **The southern corner of the land unit has an historic outspan area that features a remnant plantation on a distinctive triangular-shaped piece of land called Calcutta Bos. This outspan has landmark and associative significance and is highly regarded by people living in the area. Highlights of this land unit are the beautiful remnant Oak trees found on open fallow land and the small stream next to the historic Outspan area.**

**This landscape unit has historic and associative significance in an area with a valued rural quality, and any development will compromise its inherent rural character.**

#### 4.7.4 Outspans

As the CTS Heritage Scanner referred to the Stellenbosch Heritage Survey and Management Report (2018) (SHS&MP) identified an Outspan on the property with a proposed Grade IIIb status, and that any HIA required should focus on Archaeological and Landscape

Heritage, it is appropriate, to amplify the role and place of *outspans* in Cape history. They are, indeed, highly significant in South Africa's history and landscape, having formed a great role in the everyday life and making of South Africa, particularly in the colonial period from the 17th to 19th centuries.

However, they remained in use at least until the mid-20th century depending on the users and the survival of the outspan e.g. families who could not afford motor vehicles still used ox wagons or horse and traps to travel to town. As the journey could be quite long, a relatively long stay at any outspan outside town of a matter of days could result. Thus rural farm folk would still have their memories of the use of these sites for meeting their relatives and/or for their outspan camps on market days, holidays and other social occasions. The author's own in-laws have told me of their memories of such events.

Therefore, the SHS&MP's Appendix 5's statement about: "This outspan has landmark and associative significance and is highly regarded by people living in the area" rings true and that local residents could well have such historic and associative memories of the outspan at *Calcutta 29*.

### Outspan Definition

A quintessential South African term, *outspan* is integral to the history and development of the country. Rhodes University's *A Dictionary of South African English on Historical Principles* (DSAE)<sup>12</sup> provided the following definition and literary references:

1. In full *outspan place*: a. *hist.* In the days of waggon transport: land near a public road, set aside for public use, on which travellers broke their journey or camped while allowing their draught-animals to rest and graze. b. *transf.* **COMMONAGE**. c. *fig.* Any place at which one may break a journey (see Prance quot. at 1937). d. In recent times: any piece of land formerly designated as an outspan place. Also *attrib.* In all senses formerly also called **UITS PAN** *n.*

[1812 A. Plumptre tr. of H. Lichtenstein's *Trav. in Sn Afr.* (1928) I. 19 One of the many stations to which the name of *Auspannplatze* was given, because they 'were established by the Government for the benefit of travellers as resting-places.']

1821 C.I. *Latrobe Jnl of Visit 167* A team or set of oxen or horses put to a waggon, is called by the Dutch a *Spann*, and those places in the wilderness, where halt is made and the oxen unyoked, an *Outspann-place*.

A partial listing is provided in the Appendices to amply illustrate the vast repertoire of the word and usage in South African literature and everyday life, and gives a flavour of its changing usage from the earlier Dutch period through the British and into the Apartheid pe-

<sup>12</sup> *A Dictionary of South African English on Historical Principles*. Dictionary Unit for South African English: Associated Institute for Rhodes University. <http://dsae.co.za/#!/searchword/5458> (accessed 31 October 2018).



riod. Famous writers using the word include: WJ Burchell, LG Green, OEA Schreiner, H Rider Haggard, *et al.*

The most significant work on a Cape outspan is probably Edmund H Burrow's *Overberg Outspan: Overberg Outspan: A Chronicle of People and Places in the South Western Districts of the Cape* (1952), Maskew Miller, Cape Town. Regrettably not seen at the time of the HIA.

### Outspan History

The outspan was a place particularly related to the transport system of early times related to draught animals such as horses and oxen which were used to haul wagons around the country. The placement of such facilities might have started informally in the Dutch period when they were known from the Dutch *uitspan*. However, these were formalised during the British period such that by the time of the late Victorian period in the late 19th century, a network of Outspan sites were located around the country. These were strategically placed along major routes and, apparently, their frequency varied according to the ease or difficulty of the terrain, more outspan points being required when the going was more difficult on the animals. By the time of the Apartheid Period, the Afrikaans *Uitspan* often appears instead.

### Outspan Sites

The 1890 map of the Stellenbosch area shows numerous Outspan sites. These became *Uitspan* on later maps of the 20th century. Regardless of the linguistic history, outspan/*uitspan* sites developed in their own way as modern forms of motorised transport developed leaving behind obsolete pieces of land, the remnants of the 19th century transport outspan system. The literature references in the Appendix trace the amazing history of outspan points from its early Dutch days to its high point under colonial British administration.

### Outspans and Outdoors

Outspans could perhaps by misnomer be thought to be related to the outdoors based on the *out-* prefix. However, as the definitions show, *out-* was derived from *uit-*, the negative *un-* as in unyoke. Nevertheless, by their very nature, outspans were indeed outdoor facilities used for the resting and unyoking of draught animals, be they horses and donkeys, or teams of oxen pulling wagons. Simultaneously, they were places of rest for the people riding them.

### Outspans and Transport

These were often transport riders travelling the rough routes to the interior, but they also included farmers travelling to town and people travelling in the untamed country generally. The modern road network and high speed nature of motorised travel and before that, the railways, made these places highly habituated and regularly in use by all and sundry. Therefore, they formed key places of socialisation by those on the road, if not relaxation at the end of a hard day's travel or in-between. Depending on the going, draught animals

might have to stop up to three times in a day so they would have formed key points to stop and have a drink/meal break.

#### Outspans and Lay-bys

As the ancient way of animal transport gave way to rail and vehicle, these places remained in the community and were often reused in a similar vein for ongoing social events and meeting places outside town. Their names continued on the maps. Gradually, they became leased out for other purposes, sometimes not for related activities, such as Calcutta, but very often they continued to be used as picnic and campsites. Indeed, sometimes they were retained, where the road network remained unchanged, as lay-by points, or, at least, formed the basis for the 20th century lay-by system.

#### Outspans and Recreation

Therefore, outspans/*uitspan* sites and properties, often quite extensive, as in Calcutta at some 30 hectares, formed a highly significant open space recreational facility in South African and colonial history. While the memory of them might only remain as traces on maps and place names, local rural societies might have stronger memories of them, as in the case of Calcutta, where the reference was noted in the SHS&MP (2018).

In the modern sense, we might think of pit stops to refuel and ablutions, garages and one-stop stations, KFC and W Store snacks, but their ancient origins are beautifully illustrated below.

#### Outspan and Related Acts

Acts relating to Outspans are numerous and give an idea of the extent of this now-forgotten aspect of life at the Cape and into the 20th Century. Extracts can be found in the Appendices taken mostly from the 3,300 plus page tome *Statutes of the Cape of Good Hope, 1652-1905*.<sup>13</sup> They cover aspects related to the powers of the Divisional Councils, Trespass, Forests, Exemptions, Public Outspans, Animal Diseases, Disposal of Crown Lands, Pounds & Trespasses, Montagu Railway, Fencing and Wild Ostriches. This plethora of Acts regulating outspans was eventually consolidated in **The Public Outspans Act, 1893** which consolidated four earlier Acts, namely, **The Divisional Councils Act, 1889**; **The Fencing Act, 1883**; **The Fencing Law Amendment Act, 1891**; and the **Pounds Act, 1892**.

In the early 20th Century various Acts continued to regulate **Public Outspans** and associated **Trekpaths**:

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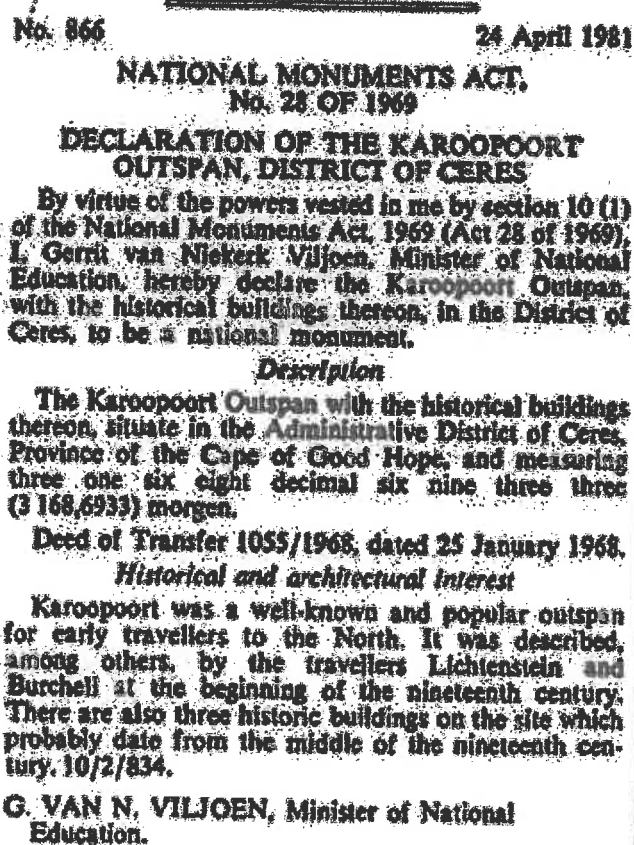
<sup>13</sup> H. Tennant and E.M. Jackson (1895). Revised and Edited by E.M. Jackson (1905). *Statutes of the Cape of Good Hope, 1652-1905*. Cape Town: Cape Times Limited, Government Printers. Digitised by the University of Pretoria, Library Services, 2013.

- The Outspans Act (1902, 1906, 1909)
- The Leasing of Outspans Act (1909)
- The Trekpaths Act (1908)
- The Trekpaths Amendment Act (1909).
- The Cape Outspans Acts (1937).

These were updated in the 1937 Act and amended/updated in 2011.

#### Outspan Monuments

The Karooport Outspan was declared in 1981.



Source: <https://www.sahra.org.za/sahris/node/30991>.

Figure 4-16: Declaration of the Karooport Outspan, District of Ceres (1981).  
The Karooport Outspan is the only outspan formerly recognised as a National Monument, now a Provincial Monument.

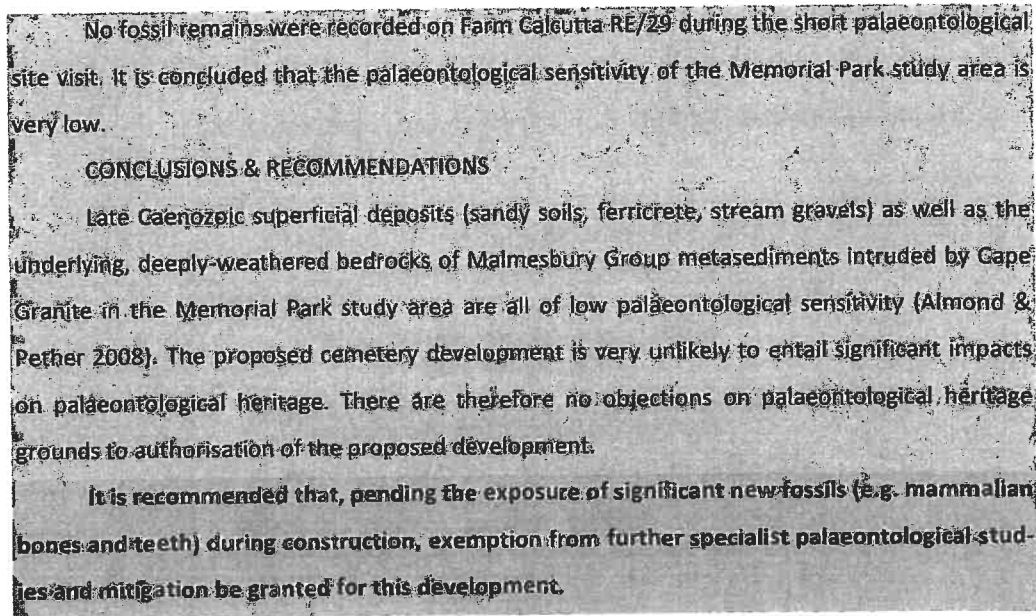
## 4.8 Heritage Contexts

The following heritage contexts are relevant to this site in terms of the provincial guideline for heritage studies (pp 21-27, see our report section 3.3.4), namely, palaeontological, archaeological and scenic/visual landscapes. All three have been assessed for likely heritage impact issues associated with the proposed development.

#### 4.8.1 Palaeontological Landscape

John Almond of Natura Viva cc prepared a Palaeontological Impact Assessment (PIA) in November 2018.<sup>14</sup> The full text of the PIA can be found in the Appendices.

The PIA notes (p 8) as follows:

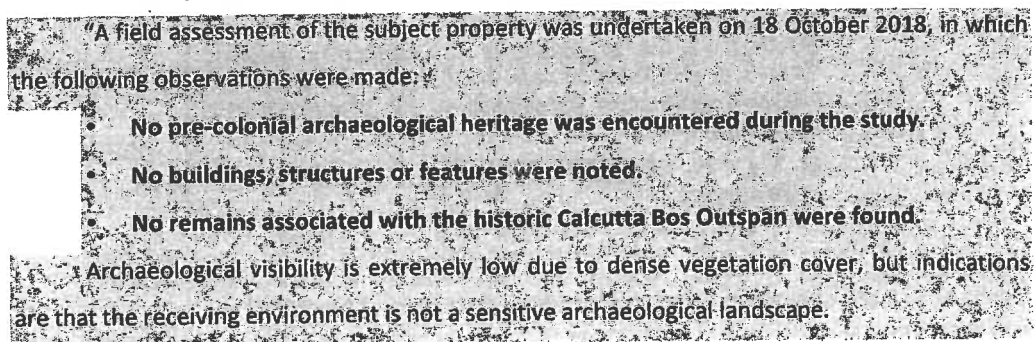


#### 4.8.2 Archaeological Landscape

Jonathan Kaplan conducted an Archaeological Impact Assessment (AIA) of the project site in October 2018.<sup>15</sup> The full text of the AIA can be found in the Appendices.

Extracts of the study results are summarised as follows (**bold added**):<sup>16</sup>

##### Results of the Study



<sup>14</sup> John E Almond, PhD (November 2018). *Proposed Memorial Park on Farm Calcutta RE/29 near Stellenbosch, Cape Winelands District Municipality, Western Cape*. Nature Viva, Cape Town.

<sup>15</sup> Jonathan Kaplan (November 2018). *Archaeological Impact Assessment: Proposed Municipal Cemetery on Farm No 29 Calcutta, near Stellenbosch, Western Cape*. Agency for Cultural Resource Management: Rondebosch.

<sup>16</sup> Executive Summary (ibid, page 1).

### Impact Statement

The results of the study indicate that the proposed construction of a new municipal cemetery on Farm No. 29 Calcutta, will not impact of important archaeological heritage.

### Conclusion

The study has identified no significant impacts to archaeological heritage that will need to be mitigated prior to the proposed development commencing.

### Recommendations

The following recommendations are made: 1. No archaeological mitigation is required prior to construction activities commencing.

#### 4.8.3 Historical Map Comparison

The following figure (see Figure 4-17) is an approximation of the 1890 survey versus today's satellite imagery and cadastral mapping. The overlay shows that the 1890 map is not entirely accurate in its outline. This may account for the old river course shown as going through the upper NE/top right sector versus today where the river now runs on a straight course towards Mariendahl Dam. Alternatively, the river course was altered subsequently sometime in the 20th century, possibly associated with the dam's construction. However, not knowing the facts, river course can change, especially during flooding events.

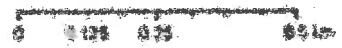
On the face of it, it does not seem to be possible to discern any of the old track which meandered along the river to the west in terms of any contemporary tracks remaining in the gum plantation, not at this scale anyway. It may still be possible to find this old track, however, if the land was ever ploughed prior to planting with gum plantation then all surface traces will now be lost. A reference to the earliest 1940s aerial photograph may help determine the exact old track/trekpath once noted. This would help to unlock and reveal the 19th century history in any future development and provide a meaningful peg for any planning framework.

**Farm Calcutta 29 STB Local 1:10,000**



**Legend**

- Provinces
- District Municipalities
- Local Municipalities
- Administrative Registration
- Allotment Township



Scale: 1:10 000

Date created: October 23, 2018



Source: New World Associates / WC Government: Agriculture.

**Figure 4-17: 1890 Plan on 2018 Aerial Photograph.**  
 Showing an approximation of the 1890 map details over today's aerial image. NTS.

#### 4.8.4 Visual-Aesthetic & Landscape

A Visual Impact Assessment<sup>17</sup> was prepared and can be found in the Appendices. Visual and scenic issues relate to the likely impact of this cemetery development on the Grade IIIb agricultural landscape and the R304. Some preliminary remarks follow:

1. The site lies adjacent to the R304, which is not a designated scenic route. The route is of mixed scenic value, more so on the southbound journey with open views to the mountains.
2. The landscape is generally open and flat with a mixed agricultural feel of open pastures, vineyards and some agricultural technology developments.
3. The site itself is covered with dense, immature gum plantation making views into the site very short.
4. The site cannot be easily seen from other roads, if at all, and neighbouring farms alone would be able to access it on north, east and south boundaries.

#### Visual-Aesthetic & Landscape Significance

*Calcutta Bos* has high significance as a local historic outspan site and is clearly marked on the 1890 map. Its current character as a woodlot or gum plantation is of more recent nature and is unlike the surrounding grassy fields, pastures and vineyards. In its present condition, it does not seem well suited to its current purpose as a woodlot, possibly fire damaged in recent years and the great drought of 2015-2018, and is out of character with its original purpose as outspan grazing and camping. Therefore it has low significance as a woodlot in its current condition but high significance if it were to restore pastoral landscape suitably equipped with shade and other facilities. Its rural setting makes it well suited to the purposes of a cemetery with easy access from the R304.

### 4.9 Heritage Significance

The proposed development of a large cemetery will have various types of impact on the heritage environment, primarily landmark, associative and visual-aesthetic, but also possibly archaeological from the outspan period once the site is cleared.

#### 4.9.1 Historic Significance

Beyond the history outlined in the sections previously, it has not come to light that there is a significant local history with this portion of land as an outspan, originally established in the colonial period and formalised under British administration of the Stellenbosch

<sup>17</sup> New World Associates (November 2018). *Calcutta 29, Stellenbosch Visual Impact Assessment*.

Divisional Council (see the Acts in the Appendices). As far as has been ascertained in the time available for study, there are no written histories of its use as an outspan but references to it surely exist as it is quite prominent being one of only seven or eight outspans in the Stellenbosch District. The SHS&MP (2018) refers to the Calcutta Bos Outspan as follows (Appendix 5):

*"This outspan has landmark and associative significance and is highly regarded by people living in the area."*

This does not apply to the entire site, however, but only to the southern portion, currently heavily invaded with Acacia. The use of the entire site as an outspan, less Portion 1 west of the R304 sold off in 1941, is part of the entire outspan site and history. Cattle were 'let loose' to graze on the site during outspan journeys, hence, its size and shading, not to mention, location for watering cattle, horses and people alike. These all-together form part of *Calcutta* outspan's collective heritage.

#### 4.9.2 Aesthetic Significance

The property has reduced aesthetic significance in the wider agricultural landscape of the area. The land is mostly flat to slightly undulating down to the river to the east. The condition of the gum plantation on site is poor, uneven and bushy. This could be greatly improved if it were restored to a better-looking open landscape condition with shade trees such as those found adjacent/south of it.

#### 4.9.3 Scientific Significance

The potential scientific significance of the site lies in the possibility of uncovering any significant archaeological or palaeontological remains. This will not be known until such time as excavation or development occurs but it is unlikely that anything would be recovered until such time as it is densely covered and transformed by, at the very least, gum plantation. It could have been ploughed prior to gum planting.

#### 4.9.4 Heritage Grading

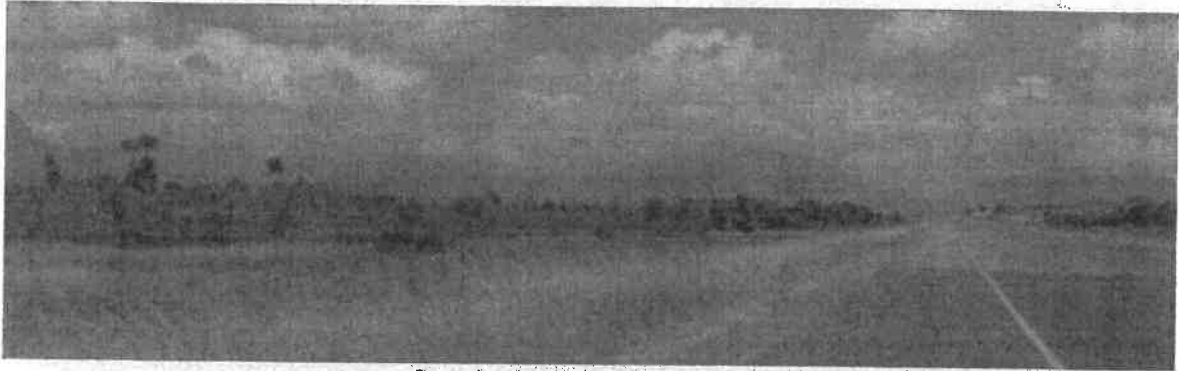
There are no structures on the site to grade but the area landscape has already been graded IIIb in the SHS&MP (2018) (see section 4.7.3 above), as has the outspan site on the southern portion been graded IIIb. This report would be inclined to agree with this as a minimum grading but the grading of outspan sites and other historic landscape/landmark features has not been undertaken systematically. As a very much forgotten feature of the landscape, except perhaps to locals, they are overlooked in their significance and might attract a



higher, even provincial Grade II grading, if more thoughtfully considered. Perhaps at the very least, in this case, a Grade IIIa grading might be considered if the criteria were clearer.

#### 4.10 Site Photographs

The following photographs show the site as it is today (taken 30 October 2018).



Source: All photographs in this report by Bruce Eitzen © 2018.

**Photograph 2: View of the site southbound on the R304.**

The above photograph shows largely flat nature of the area and site at left. Views of Stellenbosch's mountains are in the distance. The mixed sized gum tree plantation can be seen, which is also heavily invaded in places with Acacia.

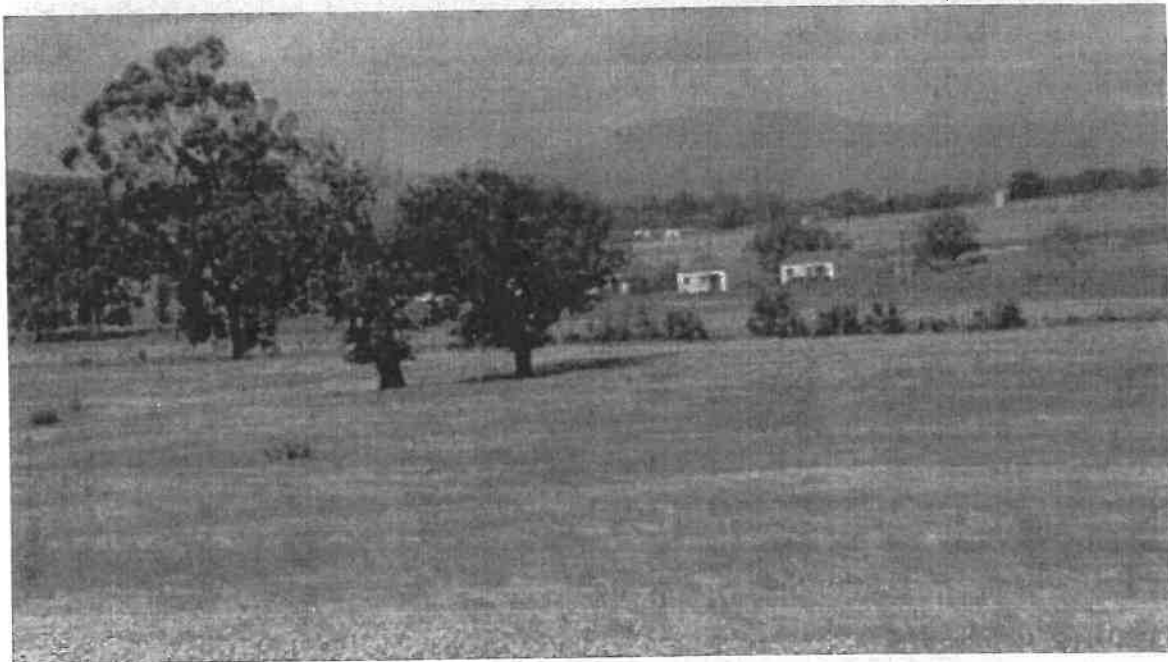
Adjacent are rolling pastures with mature Oaks, Gums and some Pine. Their situation is picturesque and possibly gives an idea of the 19th century landscape, which would have been considerably less developed at the time but quite possibly fenced.



**Photograph 3: View of the site from the R304 showing the length of the southern boundary.**



**Photograph 4: View of the site from the R304 at its southern corner, site of the old outspan.**



**Photograph 5: View of the neighbouring picturesque rolling fields with mature trees and workers cottages.**

NWA

## 5 Project Description

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### 5.1 Summary

The proposed cemetery at Calcutta 29 is one of two regional cemeteries being planned for the Stellenbosch Municipality. The Memorial Park concept plan prepared by OvP Landscape Architects (September 2018) is a first draft only. It shows a formal rectilinear layout with two axes, formal avenue planting, an informal parkland/open landscape zone to the south, and the main entrance to the north. It connects well with the surrounding landscape and is well conceived.

### 5.2 Introduction

Combined with Section 3, this chapter presents the relevant project data required to develop an HIA of the development for EIA or other application purposes. This chapter reviews the relevant basic aspects of the proposed development and includes plans and diagrams as appropriate to this end.

#### 5.2.1 Reporting Requirements

This report is generally based on South African environmental management procedures and, more specifically, on the latest provincial guideline endorsed by the Provincial Government of the Western Cape (PGWC) on 3 November 2005: *Guideline for Involving Heritage Specialists in EIA Processes* (June 2005, PGWC).

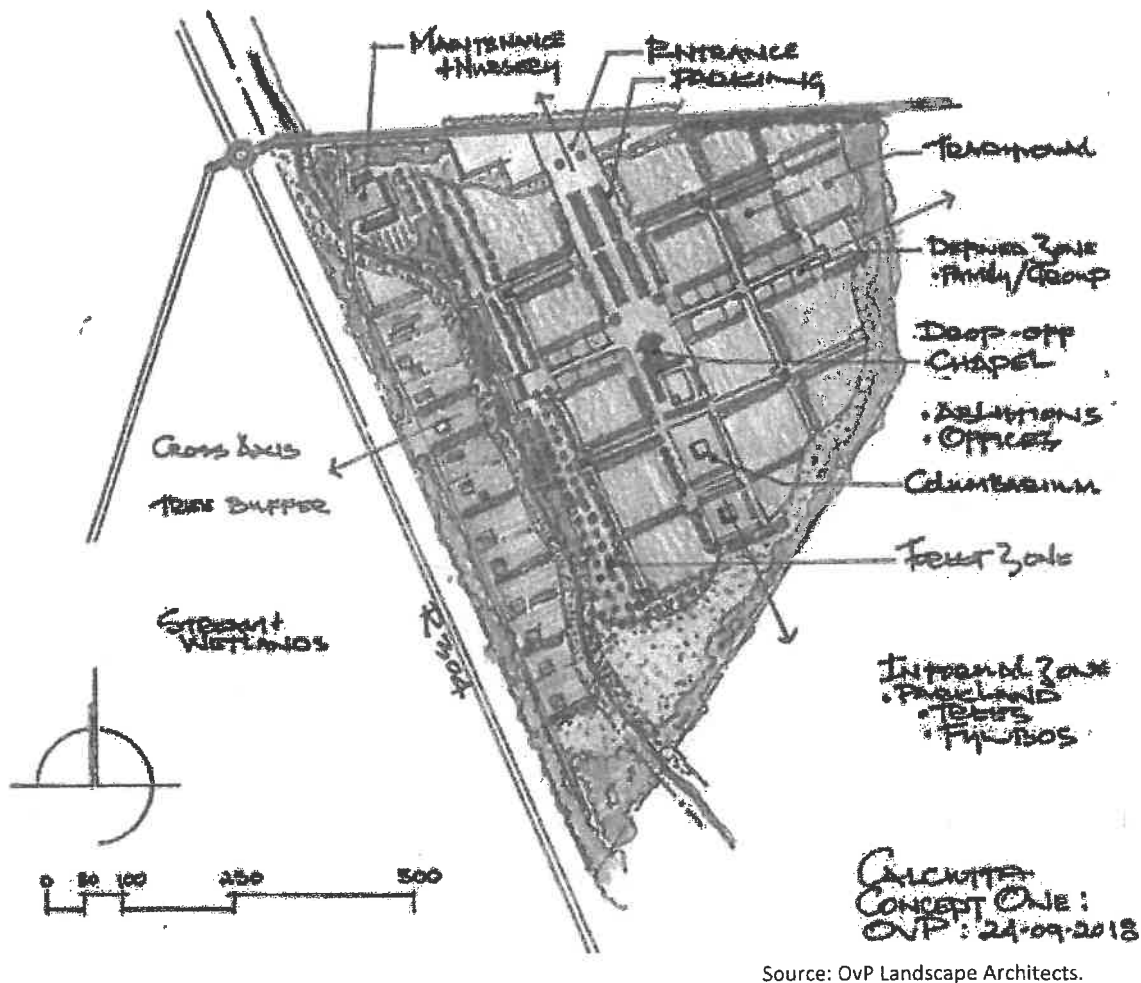
### 5.3 Development Proposal

#### 5.3.1 Town Planning Application

The applicant wishes to develop a Memorial Park for the Stellenbosch Municipality on the site.

#### 5.3.2 Memorial Park Concept

An initial First Draft has been prepared by OvP Landscape Architects (see Figure 5-1).



Source: OVP Landscape Architects.

Figure 5-1: OVP Draft Concept Plan One (24 September 2018).

This first draft is an initial concept only and was not intended for public consumption. No heritage informants were available at the time, such as the outspan site, but the site was walked.<sup>18</sup>

The plan indicates a stream running near the western/R304 boundary with a layout of small areas adjacent to it. The site is laid out on a grid parallel to the R304 with a central facility: chapel, ablutions, offices. Two axes expand off this central point, one east-west towards the road and one north-south. These are developed into various formal features including a 'columbarium'. A 'forest zone' separates the cemetery from the stream, smallholdings and R304 leaving it largely unseen from the road behind it. There is also a nursery. This extends into an open landscape to the south that would connect into the adjacent pasture. Formal avenue planting is indicated along the boundaries of the cemetery plot and special use areas. There are also formal avenue features along the main entrance axis with an entrance and new road off the R304 indicated on the northern boundary.

<sup>18</sup> Johan van Papendorp (OVP), personal communication (7 November 2018).

### **5.3.3 Landscape and Environment**

The landscape is detailed in the above plan and integrates well into the agricultural landscape. At this early concept stage, no specific details are known.

### **5.4 Alternatives**

The Calcutta Memorial Park site is one of two final cemetery sites for the Stellenbosch Municipality, chosen out of a long process of selection from an initial 50 sites! This is the final choice in this area of the municipality and seems well chosen.

NWA



## 6 Heritage Impact Assessment

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### 6.1 Summary

The Heritage Impact Assessment shows that while there are potential archaeological impacts that may arise during construction, the most significant above ground impact will be associative-landmark and visual-aesthetic. Due to the disturbed nature of the site significant archaeological impacts are unlikely; however, if archaeological finds are recovered and conserved the impact could be positive. A potential high level of overall heritage impact is indicated due to the high Category D ranking of the project type and Context 2 medium to high heritage value of this Grade IIb Landscape and Site requiring a Level 4 HIA. At this time, the potential identified tangible heritage impacts are landmark and visual/aesthetic, which has been ranked as having a moderate visual and aesthetic impact. The intangible heritage impact is associative. Recommendations to mitigate the various potential heritage impacts are made.

### 6.2 Introduction

This chapter uses the information collected in the previous chapters to determine the likely significant heritage impacts of the proposed project on the heritage environment.

There are four possible areas of heritage identified in the study that could be affected by the development: archaeological, associative-landmark and visual-aesthetic landscape.

#### 6.2.1 Key Issues

1. *Calcutta 29* belongs to the Stellenbosch Municipality; prior to that it was Crown Land and was set aside as a Public Outspan.
2. No fossil remains were recorded on Farm Calcutta RE/29 during the short palaeontological site visit. It is concluded that the palaeontological sensitivity of the Memorial Park study area is very low.

3. The Archaeologist found no archaeological remains or any structures on site during the field inspection but the possibility remains that some may be found during construction.
4. The site history specifics are not known but it is currently used for a gum plantation with trees currently being immature and of mixed age, under 10 years old.
5. The site is largely flat and wet, at least in parts, falling on river flats/*vlaktes* of the upper Krom/Plankenburg River.
6. The western portion of the site is highly visible from the R304 that connects from the N1 into Stellenbosch.
7. The first draft concept plan is well suited to the site and is well fit to the local context making some allowance for the outspan site.

### 6.3 Heritage Impact Assessment

#### 6.3.1 Significance of Heritage Impacts Expected

The following table helps identify the likely level of heritage impact. The result may vary once field trips and impact assessments have been prepared.

HERITAGE CONTEXT	TYPE OF DEVELOPMENT			
	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D
CONTEXT 1 High heritage value	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected	Very high heritage impact expected
CONTEXT 2 Medium to high heritage value	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected	Very high heritage impact expected
CONTEXT 3 Medium to low heritage value	Little or no heritage impact expected	Minimal heritage impact expected	Moderate heritage impact expected	High heritage impact expected
CONTEXT 4 Low to no heritage value	Little or no heritage impact expected	Little or no heritage impact expected	Minimal heritage impact expected	Moderate heritage impact expected

Source: DEA&DP Guideline for Involving Heritage Specialists in EIA Processes (p 28).

Figure 6-1: The relationship between the Significance of a Heritage Context, the Intensity of Development and the Significance of Heritage Impacts to be expected.

Based on the above table, the overall heritage context can be described as Context 2 being "of medium to high intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3B heritage resources" combined with a Category D development (highest project order), a **Very High Heritage Impact** is predicted (PGWC Heritage Specialist Guideline, p 28). This requires a **Level 4 Heritage Impact Assessment** (*ibid*, p 39).



## Heritage Contexts

The following table describes the features of the various heritage contexts.

Context 1:	Of high intrinsic, associational and contextual heritage value within a national, provincial and local context, i.e. formally declared or potential Grade 1, 2 or 3A heritage resources
Context 2:	Of moderate to high intrinsic, associational and contextual value within a local context, i.e. potential Grade 3B heritage resources.
Context 3:	Of medium to low intrinsic, associational or contextual heritage value within a national, provincial and local context, i.e. potential Grade 3C heritage resources
Context 4:	Of little or no intrinsic, associational or contextual heritage value due to disturbed, degraded conditions or extent of irreversible damage.

Source: DEA&DP Guideline for Involving Heritage Specialists in EIA Processes (p 28).

Figure 6-2: Key to Heritage Contexts.

## Categories of Development

The following table describes the various development categories.

Category A: Minimal intensity development	<ul style="list-style-type: none"> <li>No rezoning involved; within existing use rights.</li> <li>No subdivision involved.</li> <li>Upgrading of existing infrastructure within existing envelopes</li> <li>Minor internal changes to existing structures</li> <li>New building footprints limited to less than 1000m<sup>2</sup></li> </ul>
Category B: Low-key intensity development	<ul style="list-style-type: none"> <li>Spot rezoning with no change to overall zoning of a site</li> <li>Linear development less than 100m</li> <li>Building footprints between 1000m<sup>2</sup>-2000m<sup>2</sup></li> <li>Minor changes to external envelope of existing structures (less than 25%)</li> <li>Minor changes in relation to bulk and height of immediately adjacent structures (less than 25%).</li> </ul>
Category C: Moderate intensity development	<ul style="list-style-type: none"> <li>Rezoning of a site between 5000m<sup>2</sup>-10 000m<sup>2</sup></li> <li>Linear development between 100m and 300m</li> <li>Building footprints between 2000m<sup>2</sup> and 5000m<sup>2</sup></li> <li>Substantial changes to external envelope of existing structures (more than 50%)</li> <li>Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 50%)</li> </ul>
Category D: High intensity development	<ul style="list-style-type: none"> <li>Rezoning of a site in excess of 10 000m<sup>2</sup></li> <li>Linear development in excess of 300m</li> <li>Any development changing the character of a site exceeding 5000m<sup>2</sup> or involving the subdivision of a site into three or more even.</li> <li>Substantial increase in bulk and height in relation to immediately adjacent buildings (more than 100%)</li> </ul>

Source: DEA&DP Guideline for Involving Heritage Specialists in EIA Processes (p 29).

Figure 6-3: Key to Categories of Development.

Heritage resources are conserved, firstly, by identifying their location on site and their significance; and, secondly, by making recommendations to retain that significance and mitigate potential impacts. Extracts and discussion from the PIA, AIA and VIA follows with particular reference to potential heritage impacts and recommendations to mitigate them.

## 6.4 Palaeontology

### 6.4.1 Conclusions

Late Cenozoic superficial deposits (sandy soils, ferricrete, stream gravels) as well as the underlying, deeply-weathered bedrocks of Malmesbury Group metasediments intruded by Cape Granite in the Memorial Park study area are all of low palaeontological sensitivity (Almond & Pether 2008). The proposed cemetery development is very unlikely to entail significant impacts on palaeontological heritage. There are therefore no objections on palaeontological heritage grounds to authorisation of the proposed development.

### 6.4.2 Recommendations

It is recommended that, pending the exposure of significant new fossils (e.g. mammalian bones and teeth) during construction, exemption from further specialist palaeontological studies and mitigation be granted for this development.

## 6.5 Archaeology

### 6.5.1 Impact Statement

The results of the study indicate that the proposed construction of a new municipal cemetery on Farm No. 29 Calcutta, will not impact of important pre-colonial archaeological heritage.

Artefactual remains associated with the historic Calcutta Bos Outspan may, however, be revealed or exposed during preparation of the site for development.

### 6.5.2 Conclusion

The study has identified no significant impacts to archaeological heritage that will need to be mitigated prior to the proposed development commencing.

### 6.5.3 Recommendations

The following recommendations are made:

1. No archaeological mitigation is required prior to construction activities commencing.
2. As a precaution, the site should be scanned for artefactual remains dating from the time of the Calcutta Bos Outspan, once vegetation has been cleared and removed from the site.

## 6.6 Associative-Landmark

The associative and landmark status of the Calcutta Outspan landscape and site has already been identified and graded IIIb by the SHS&MP (2018). The old outspan site is held in high regard by locals and memories of the use of outspans are still current today as they remained in use until the mid-20th century.

The review of the history and layout of outspans in the Cape Town – Stellenbosch area showed that as of the late 19th century, there were only a handful of official outspans in the Stellenbosch Division; eight to be precise. There were three in the northern area between Klapmuts – Kraaifontein, of which the Calcutta site is the only one remaining, more or less intact as a purely rural site.

#### 6.6.1 Impact Assessment

The potential impact of the proposed cemetery site on the old outspan is significant in that it is a wholesale change of land use from woodlot to cemetery. However, the draft concept plan has sensitively, if not, fortuitously, allowed for the conservation of the southern outspan site and surrounds in its overall framework. It would now be placed in the buffer informal parkland zone. At this time, there are no specific archaeological remains although considering the bushy plantation and invaded character this is not unsurprising. Careful clearing of the area may uncover some faint traces of its 19th/20th century use as may mid 20th century aerial photographs reveal its last use as outspan. Were the outspan site and surrounds be carefully conserved and landscaped, this would retain a memory of its core purpose and allow for local associations to be retained of the site's outspan purpose and character thus mitigating associative impact and retaining landmark value.

#### 6.6.2 Recommendation

The following recommendations are therefore made to mitigate the potential associative and landmark impact of the cemetery development:

1. **Outspan Site Set Aside:** Set aside the southern portion of the site in a buffer zone as indicated but specifically the southwestern corner, say in a 50m radius, and designate this as the outspan site.
2. **Confirmation of Outspan Site Location:** This actual position should be confirmed if possible by further historical research and interview of locals.
3. **Review of Historical Aerial Photography:** to check the earliest 20th century imagery and layout of the site.
4. **Outspan Site Development and Interpretation:** Once all the facts about the outspan have been determined, a specific plan for the historic Outspan Site's development should be prepared including interpretive information and signage. This may include some traces of the route of the old Klapmuts Trekpath that once

crossed the site being built into the overall cemetery plan and any other information or practices that were/are associated with the outspan.<sup>19</sup>

5. **Outspan Route Recognition/Declaration:** The memory of outspans does not seem to be remembered or celebrated in any cohesive or coordinated manner by heritage. As outspans formed such a significant role in the early Cape landscape, if not South African landscape, it seems appropriate that this be celebrated. The Calcutta Outspan site is largely intact and without knowledge of the status and condition of other outspans in Stellenbosch or Cape Town and surrounds, it may be that this outspan's grading might be upgraded to IIIa, if not Grade II as part of a provincial scheme without affecting the intention to use it as a cemetery which is fully within the power of the various Outspan Acts. The determination of the value of the various outspans' grading could only be made as part of a wider study of outspans and trekpaths. This 'recommendation' or suggestion is outside this HIAs mandate so is for consideration by the Stellenbosch Municipality as a separate study that could have both heritage and tourist value.

## 6.7 Visual-Aesthetic

The greatest likely impact is on the visual environment being rural and partially scenic along this route.

### 6.7.1 Summary Visual Impact Assessment<sup>20</sup>

- **Visual Impact:** The proposed development will have a moderate impact on the landscape causing some change to the visual environment.
- **Visibility:** The development has moderate to high visual exposure, moderate visual absorption capacity, medium compatibility, and is moderately to highly visible (R304).
- **Nature of Impact:** The development's visual impact has site-related to local extent, long term duration, medium intensity, definite probability, and medium significance on the landscape.
- **Recommendations are made to minimise visual and aesthetic impact."**

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<sup>19</sup> At this time of the first HIA draft, November 2018, feedback from the Stellenbosch Municipality and local heritage bodies had yet to be obtained. They may well have more information to hand than was available at the time of writing that can be used in these recommendations.

<sup>20</sup> Bruce Eitzen (November 2018). *Calcutta 29, Stellenbosch Visual Impact Assessment*. New World Associates, Landscape Architects, Fish Hoek.

### 6.7.2 VIA Recommendations

The following recommendations were extracted from the VIA (pp 53-55). Construction, Operation and Decommissioning recommendations are made on p 56.

#### Mitigation Recommendation: Planning and Design

The plan presented to date is an initial concept only. Therefore it is well able to take on any mitigation recommendations.

1. **Site Development Plan:** As noted previously, the concept plan is well conceived and sensitively fit to the landscape already:
  - 1.1 Taller structures such as the central facilities should be set back from the road as they are currently indicated and should not be moved to the edges of the site or nearer the R304.
  - 1.2 The landscape buffer along the edges is important to retain and should be well planted to prevent views into the site except at strategic locations such as on-axis.
  - 1.3 The HIA refers to the old *trekpath* to Klapmuts and the possibility of finding any historical aerial or other photographs that could be used to inform and retain any traces of the old outspan.
  - 1.4 Sustainable site development and Green Building principles or standards should be employed to enhance the environmental aesthetic.
  - 1.5 Lighting must be carefully managed to minimise excessive lighting wherever possible (see Operation Phase below).
2. **Colouration:** Careful colouration of fences in particular needs to be made, as well as any other landscape furniture such as lighting, benches, water features. These should preferably be in a natural colour palette that will not stand out from the agricultural landscape nor draw attention to itself with bright colouration. Likewise, building colours, walls and roofs, should be subtle.
3. **Landscape Plan:** The Landscape Plan should retain its existing features overall and not be changed to something completely different such as a freeform design. The traditional arrangement of cemeteries, the avenues and bounding walls will fit well into both the historical and cultural landscape.
  - 3.1 Wherever possible the greening/ planting of the scheme needs to be maximised.
  - 3.2 Permeable paving and other sustainable practices should be incorporated into the landscape plan.

- 3.3 Planting using indigenous and preferably endemic species from the area should be planned from the beginning; traditional exotic trees are acceptable.
- 3.4 Large trees should be incorporated into the Landscape Plan to screen tall buildings or unsightly areas such as the nursery/maintenance yard.
- 3.5 Gum trees, pines and oaks, while not indigenous, are typically the only major trees that can survive the rugged environment and achieve the necessary scale. They are also traditional cultural elements and not out of place as a result.
- 3.6 Indigenous/endemic trees can also be used but are not as tall as gums.
4. **Perimeter Treatment:** As described above this may incorporate screening trees or fences. The treatment of perimeter fencing and any signage needs to be carefully considered.
  - 4.1 Unsightly massive walls are not appropriate but the traditional low Cape farm werf wall may suffice well on the boundary and help locate the site on the R304.
  - 4.2 Should fencing be required use clear-view fencing or similar is preferred, not palisade. It should be coloured a dull green to match the local environment and not black, silver, brown or other unnatural, standard commercial colours.
5. **Biodiversity:** As noted above, where possible, endemic planting schemes should be used with the exception of traditionally planted trees, which are permissible for practical and cultural landscape reasons.
6. **Maintenance:** Scheme maintenance both of buildings and landscape need to be undertaken with commercial maintenance projects with this intention from the outset for the duration of the project. Good site tidiness should be maintained at all times.
7. **Visual Assessor Review:** The proposed Landscape Plan should be referred to the visual impact assessor, namely, New World Associates, for review before it is approved, to ensure that it meets the recommendations of this report.

This concludes the Heritage Impact Assessment.

A select Bibliography follows.

NWA

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# Appendices

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Containing various appendices as referred to in the text.

- A. **A Dictionary of South African English: outspan**
- B. **Outspan Acts**
- C. **Palaeontological Impact Assessment (PIA)**
- D. **Archaeological Impact Assessment (AIA)**
- E. **Visual Impact Assessment (VIA)**
- F. **Local Heritage Body Comment**

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**ANNEXURE X**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**VISUAL IMPACT ASSESSMENT**



**CALCUTTA 29, STELLENBOSCH – CEMETERY**

**VISUAL IMPACT ASSESSMENT**

NOVEMBER 2018 08 PHOTOGRAPH 1 VIEW OF THE SITE FROM THE R304

researched and produced by

**New World Associates © for CK Rumboll & Vennote**

*Calcutta 29, Stellenbosch VIA | Page ii*



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**New World Associates, Landscape Architects—[newworld@telkomsa.net](mailto:newworld@telkomsa.net).**

**This report should be printed double sided if at all!**

## Reflection

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“The term ‘visual and aesthetic’ is intended to cover the broad range of visual, scenic, cultural, and spiritual aspects of the landscape. However, for the purpose of brevity, the term ‘visual’ is used in the text’ (p 1). **Thus it includes aspects of “the area’s sense of place, ... natural and cultural landscapes, ... the identification of all scenic resources, protected areas and sites of special interest, together with their relative importance in the region, ... the need to include both quantitative criteria, such as ‘visibility’, and qualitative criteria, such as landscape or townscape ‘character’ (pp 1-2).”**

This report (p 19) from the *PGWC Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (November 2005)*

“**Visual impact. The value of the environment is often under-estimated from a visual perspective.** It is the visual quality of the environment that, to a large degree, generates the attraction for the tourism industry and draws people to certain areas as desired locations for living a lifestyle outside of the large cities and densely developed urban areas. **The visual resources of rural areas, such as scenic landscapes and the cultural streetscapes and farmsteads,** and environments such as the Garden Route [Swartland], constitute major tourist attractions. ...

Each area has its own unique visual character and atmosphere, which plays an important role in the quality of any tourist experience. The diversity of the landscapes makes it essential to consider all development **and more particularly the expansion of urban areas, an issue that requires special consideration.** The intention is to manage urban development in such a way that no development would detract from the visual quality of the environment **and that all development conform to a characteristic style and urban form that suits the character of the area.”**

This report (p 21) from the *PGWC Urban Edge Guideline (December 2005)*

☞ Beauty is in the eye of the beholder.

What the eye doesn't see, the heart doesn't grieve over.

*English Proverbs*

☞ Do not seek revenge or bear a grudge against one of your people,  
**but love your neighbour as yourself. I am the LORD.**

*Mosaic Law, Leviticus 19.18, The Holy Bible (NIV)*

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# 1 Executive Summary

---

## 1.1 Recommendation

The proposed Stellenbosch municipal cemetery on farm Calcutta 29 shows a well-conceived concept plan well integrated into the landscape. The site and area is generally flat with an open landscape while the site itself is densely planted with immature gum plantation. Visibility is high only along its western boundary that runs along the R304 while views into the site are blocked by the bushy gum plantation. The visual and aesthetic sensitivity of the area is generally moderate and the anticipated impact on scenic resources is moderate but can be mitigated to low with continued sensitive site planning. Recommendations are made to minimise these visual and aesthetic impacts.

## 1.2 Project Description (see page 12)

1. The proposed development of a cemetery for Stellenbosch Municipality on the farm Calcutta 29, Stellenbosch is one of three municipal cemeteries planned.
2. The draft Concept Plan shows a formal layout with area for cemetery plots set amongst formal avenue tree planting.
3. A pair of cross axes elegantly divides the site into quadrants creating separate areas and long views and access into the site.
4. A stream is indicated and a natural buffer, informal zone to the south. The high level of planting and grid layout fits neatly into the overall winelands matrix.

## 1.3 Legal and Administrative Requirements (see page 16)

1. There is a long history of environmental protection and management in South Africa rooted in EIA and, later, IEM, which has given rise to the current requirement for VIA. The latest document (November 2005) prepared by the Provincial Government of the Western Cape defines the scope and preparation of VIAs and has now been approved and adopted.

2. Provision in the various Acts is made for special areas and landscapes that have an important effect on the ranking of visual impact in these areas.
3. The SHS&MP (2018)<sup>1</sup> provides graded heritage and landscape character information for the Stellenbosch Municipality. VIA is integral to assessing heritage impact in scenic heritage areas like the winelands.

#### **1.4 Visual Environment Description (see page 33)**

1. The site lies adjacent to the R304, which is not a designated scenic route. The route is of mixed scenic value, more so on the southbound journey with open views to the mountains.
2. The landscape is generally open and flat with a mixed agricultural feel of open pastures, vineyards and some agricultural technology developments.
3. The site itself is covered with dense, immature gum plantation making views into the site very short.
4. The site cannot be easily seen from other roads, if at all, and neighbouring farms alone would be able to access it on north, east and south boundaries.

#### **1.5 Visual Impact Assessment (see page 42)**

1. The R304 is only moderately scenic, particularly southbound and runs adjacent to the site's west boundary.
2. The flatness of the site and its dense gum plantation blocks views into the site while indicating its location generally in the open landscape of fields and vineyards.
3. The proposed development will have a moderate impact on the landscape causing some change to the visual environment.
4. The development has moderate to high visual exposure, moderate visual absorption capacity, medium compatibility, and is moderately to highly visible (R304).
5. The development's visual impact has site-related to local extent, long term duration, medium intensity, definite probability, and medium significance on the landscape.
6. Recommendations are made to minimise visual and aesthetic impact.

#### **1.6 Visual Management and Monitoring Plan (see page 57)**

1. Sound Visual Management is the ultimate aim of the VIA process. The Mitigation Recommendations developed in the report need to be implemented.

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<sup>1</sup> Cape Winelands Professional Practices in Association (2018). *Stellenbosch Heritage Survey & Management Plan*. Stellenbosch Municipality.

2. This process of implementation will occur throughout the lifetime of the project, hence, the need for a Monitoring Plan. Institutions, individuals and organisations referred in the Monitoring Plan must develop a means of achieving the monitoring otherwise this report serves no purpose.
3. Once the VIA Report has been approved, the Developers must seek the implementation of the recommendations as soon as possible.

NWA

## 2 Project Description

---

### 2.1 Summary

The proposed development of a cemetery for Stellenbosch Municipality on the farm Calcutta 29, Stellenbosch is one of three municipal cemeteries planned. The draft Concept Plan shows a formal layout with area for cemetery plots set amongst formal avenue tree planting. A pair of cross axes elegantly divides the site into quadrants creating separate areas and long views and access into the site. A stream is indicated and a natural buffer, informal zone to the south. The high level of planting and grid layout fits neatly into the overall winelands matrix.

### 2.2 Introduction

Combined with Section 3, this chapter presents the relevant project data required to develop a Visual Impact Assessment (VIA) of the development for Environmental Impact Assessment (EIA) purposes, in particular, Heritage Impact Assessment (HIA). This chapter reviews the relevant basic aspects of the proposed development and includes plans and diagrams as appropriate to this end.

#### 2.2.1 Background

New World Associates was commissioned by the Town and Regional Planners CK Rumboll & Vennote to prepare the VIA for this project. EnviroAfrica is undertaking the environmental application. Developments of this scale and nature in scenic and historic environments, within or without the Urban Edge, require Visual Assessments in accordance with the PGWC Guideline for Specialist Visual Studies (pp 11-12).

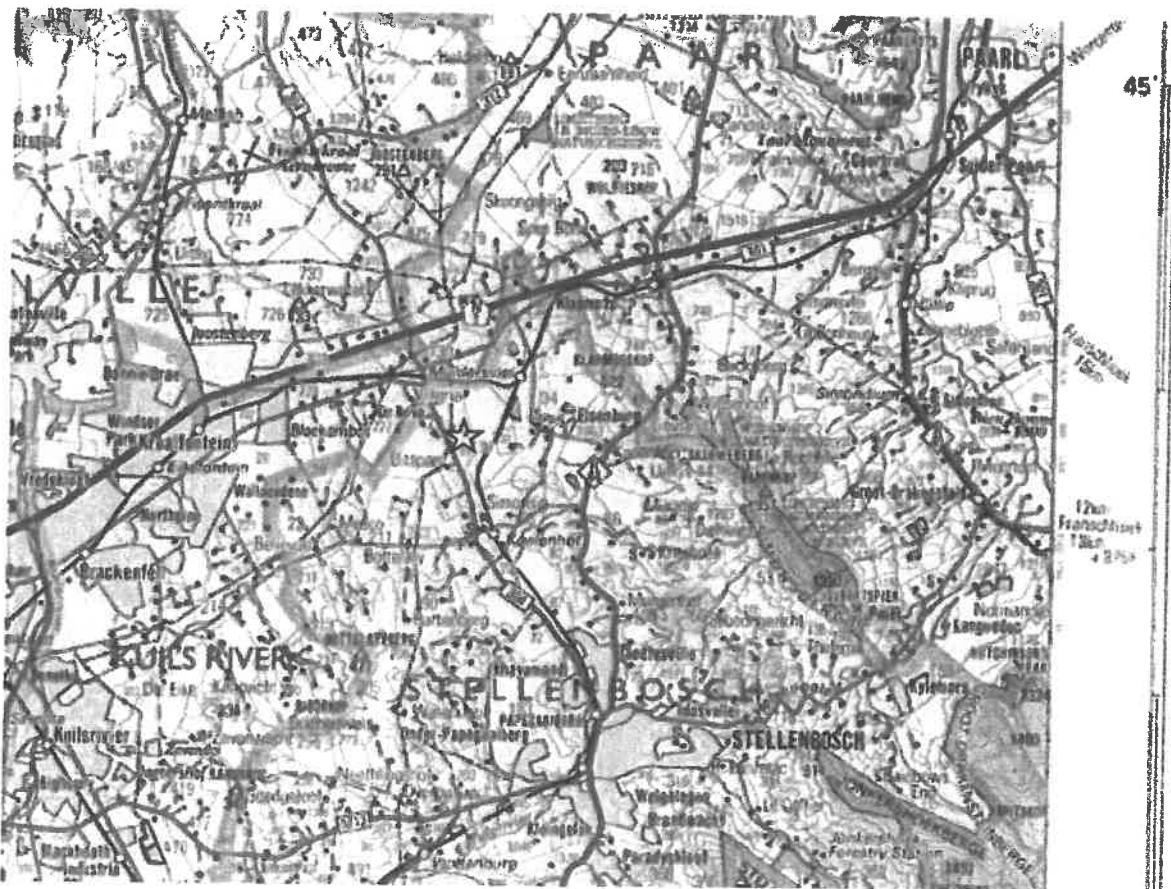
#### 2.2.2 Accreditation

Bruce Eitzen ML BSc PrLArch MEMBER ILASA APHP conducted this assessment. He is a registered Landscape Architect and Environmental Planner with the South African Council of Landscape Architecture Professionals (SACLAP), and Specialist Practitioner in Visual and Landscape Heritage. He has thirty years experience across the board of Landscape Architecture and Envi-

ronmental Planning and has practised in South Africa, Central Africa and East Africa. He holds a BSc (Botany) from the University of Cape Town and a Masters in Landscape Architecture from the University of Pretoria. His public service includes serving for three years on the Association of Heritage Practitioners Executive Committee chairing Professional Practice. He also served on the National Executive Committee of the Institute for Landscape Architects in South Africa and was the Chair of ILASA Cape for four years.

### 2.2.3 Statement of Independence

New World Associates is an independent consulting firm practising in the abovementioned fields. None of its members have any financial interest in the proposed development nor are involved in any other projects being undertaken by the developer.



Source: Reproduced by permission of the Chief Directorate: Surveys and Mapping, State Copyright 2000.

**Figure 2-1: Regional Context.**

Portion of a 1:250,000 map of South Africa showing the site's location (3318 Cape Town, 9th Edition 2000). NTS.

### 2.2.4 Reporting Requirements

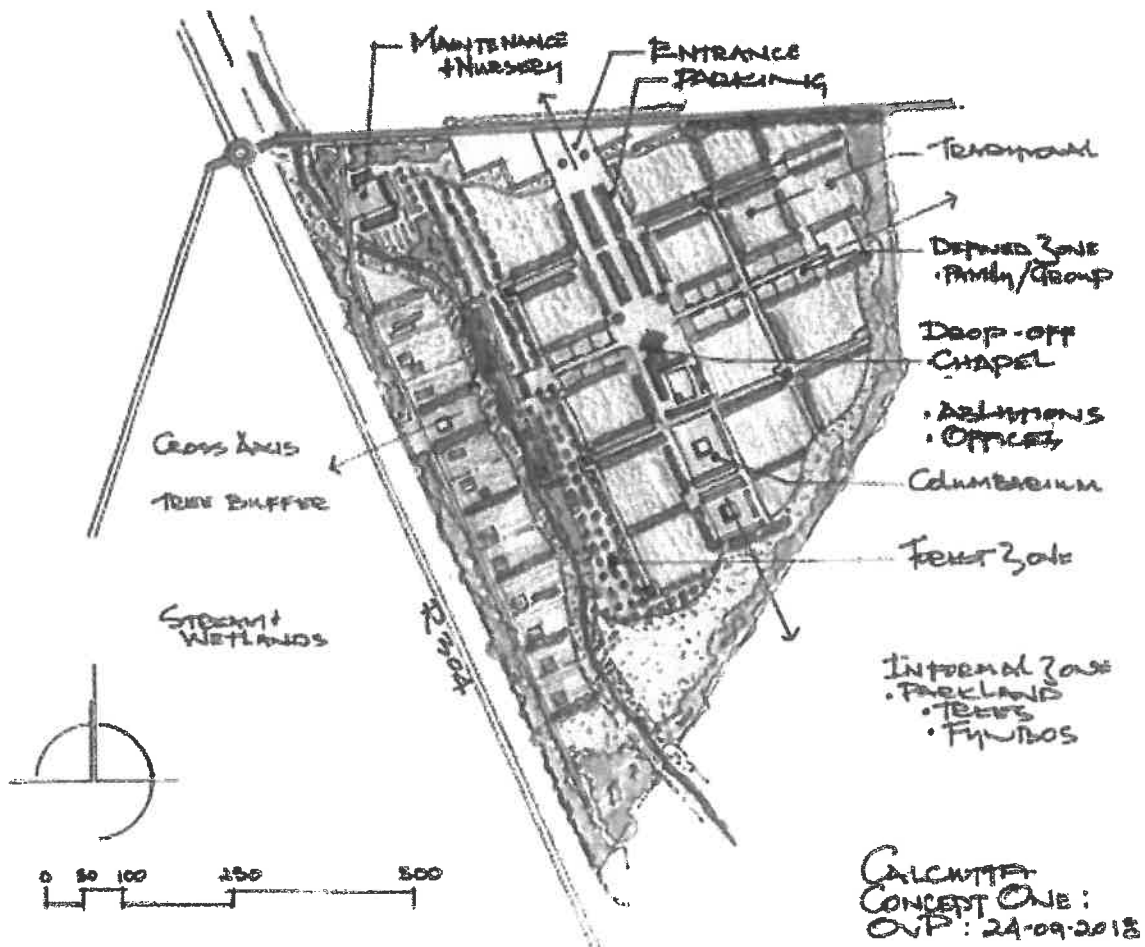
This report is generally based on South African environmental management procedures and, more specifically, on the latest provincial guideline was endorsed by the Provincial Gov-

ernment of the Western Cape (PGWC) on 3 November 2005: *Guideline for Involving Visual and Aesthetic Specialists in EIA Processes* (November 2005, PGWC).

## 2.3 Project Proposal

### 2.3.5 Location

The site occurs near Koelenhof between Stellenbosch, Kraaifontein and Paarl adjacent to the R304 (see Figure 2-1). *Uitspan* is noted to the left of which the Calcutta 29 portion once formed a part. Its gum trees stand out from the surrounding countryside, which tends to be open fields and vineyards. The R304 connects Stellenbosch and Malmesbury directly. A railway line also follows the R304 to the east but veers off to the NE just south of the site in the direction of Klapmuts.



Source: OvP Landscape Architects.

Figure 2-2: OvP Draft Concept Plan One (24 September 2018).

This first draft is an initial concept only and was not intended for public consumption. No heritage informants were available at the time, such as the outspan site, but the site was walked.<sup>2</sup>

<sup>2</sup> Johan van Papendorp (OvP), personal communication (7 November 2018).



### **2.3.6 Town Planning Application**

The applicant wishes to develop regional cemetery on the site as indicated in the concept plan. It is one of three such new cemeteries proposed by the Stellenbosch Municipality.

### **2.3.7 Landscape and Environment**

The layout (Figure 2-2) developed by the OvP Landscape Architects is rooted in landscape design principles. The gridiron layout and cross axes elegantly divide the site, allowing for different use areas while integrating landscape and tree planting throughout. A substantial informal landscape buffer zone to the south and the overall layout integrates the proposal neatly into the landscape of vineyards and pastures.

## **2.4 Alternatives**

There are no alternative concept plans at this time, however, the site choice has been made from an initial set of some 90 sites of which 3 have been chosen. This site and general layout with integrated landscaping seems well suited to the purpose.

NWA

## 3 Legal and Administrative Requirements

---

### 3.1 Summary

There is a long history of environmental protection and management in South Africa rooted in EIA and, later, IEM, which has given rise to the current requirement for VIA. The latest document (November 2005) prepared by the Provincial Government of the Western Cape defines the scope and preparation of VIAs and has now been approved and adopted. Provision in the various Acts is made for special areas and landscapes, which has an important effect on the ranking of visual impact in these areas. The SHS&MP<sup>3</sup> (2018) provides graded heritage and landscape character information for the Stellenbosch Municipality. VIA is integral to assessing heritage impact in scenic heritage areas like the winelands.

### 3.2 Introduction

This chapter provides the important and necessary policy, legal and administrative background for the visual impact study. A general overview of the relevant documents with specific reference to those applicable to visual planning is included. Particular mention is made of local planning guidelines that have the most direct bearing on the project such as the Spatial Development Framework (SDF) for the given area.

#### 3.2.1 Background

The policy, legal and administrative framework for conservation, EIA and development in South Africa has long roots. Visual Impact Assessment (VIA) is mentioned in the national requirements for EIA under the National Environmental Management Act (NEMA) and the Environmental Conservation Act. Furthermore, the provincial government now endorsed its own guidelines for various EIA processes including VIA (PGWC, November 2005). Specific require-

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<sup>3</sup> Cape Winelands Professional Practices in Association (2018). *Stellenbosch Heritage Survey & Management Plan*. Stellenbosch Municipality.

ments for VIA may also included in local Spatial Development Frameworks (SDF) and Integrated development Plans (IDP).

### 3.3 Policy Framework

#### 3.3.1 Environment Conservation Act No. 73 of 1989 (ECA), Part I: Policy for Environment Conservation

The policy for environmental protection and management is found in the Environment Conservation Act (ECA) No. 73 of 1989, Part I: Policy for Environment Conservation and is well established in South African environmental policy and law.

#### 3.3.2 IEM Guideline Series (1992)

This Guideline Series issue by the DEA in 1992 is the foundation of the current IEM procedure and contains highly useful information on IEM and EIA in South Africa including the preparation of EIA reports and the typical outline used in this VIA. *IEM Guideline Series: 3 Guidelines for Report Requirements* included "Cultural and historic environment (e.g. site of architectural and cultural interest, visual impact)." This is the first specific reference to Visual Impact in the national legislation and documentation covering EIA.

### 3.4 Legal Framework

This review of current documentation is made with specific reference to requirements for VIA in the Law and by National Guidelines.

#### 3.4.1 Environmental Impact Management: A National Strategy for IEM in South Africa (April 1998)

This discussion document on Integrated Environmental Management (IEM) defines IEM as: "the coordinated planning and management of all human activities in a defined environmental system, to achieve and balance the broadest possible range of short- and long-term environmental objectives." Further: "The overarching goal of IEM is to help ensure that South Africa's developing economy is redirected (or reoriented) from environmentally unsustainable growth and development towards environmental sustainability" (p 14). "Activities that IEM should manage" include: land use zoning plans and schemes, new activities, existing activities, and activities undertaken in terms of a land use zoning plan or scheme that has already been approved through IEM."

In terms of Scoping as it relates to the compilation of reports such as this VIA, the Main Aims of Scoping are "to focus the study on reasonable alternatives and relevant issues to ensure that the resulting *Impact Assessment* is useful to the decision-maker and addresses the concerns of interested and affected parties" (p 5, *IEM Guideline Series: 2 Guidelines for Scoping*, 1992).

### 3.4.2 National Environmental Management Act No. 107 of 1998 (NEMA)

This Act is “To provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.” Chapter 5: Integrated Environmental Management has among its general objectives: (b) “identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2” (p 34). The Act also allows for Chapter 7: Compliance, Enforcement and Protection of Part 1: Environmental Hazards and the Duty of Care and Remediation of Environmental Damage (28). Chapter 9: Administration of Act allows for Model Environmental Management Bylaws (46), “aimed at establishing measures for the management of environmental impacts of any development with the jurisdiction of a municipality. ... (4) The purpose of the model bylaws...must be to—

1. (a) mitigate adverse environmental impacts;
  2. (b) facilitate the implementation of decisions taken, and conditions imposed as a result of the authorisation of new activities and developments, or through the setting of norms and standards in respect of existing activities and developments; and
  3. (c) ensure effective environmental management and conservation of resources and impacts within the jurisdiction of a municipality in co-operation with other organs of state.
5. ...must include measures for environmental management, which may include—(a) auditing, monitoring and ensuring compliance; and (b) reporting requirements and the furnishing of information.”

### 3.4.3 National Environmental Management: Biodiversity Bill, 2003 (BB)

This Bill is: “To provide for the management and conservation of South Africa’s biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.” Of particular interest here is Chapter 3: Biodiversity Planning and Monitoring; Chapter 4: Threatened or Protected Ecosystems and

Species; and Chapter 5: Species and Organisms Posing Potential Threats to Biodiversity, notably Part 1: Alien Species and Part 2: Invasive Species.

#### 3.4.4 PGWC Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (Edition 1, June 2005)

This newly endorsed guideline (November 2005) is the most relevant document that now guides VIA in the Western Cape. It is a highly useful document and has been used to guide this report. While lacking a definition of VIA, it states in the Introduction: "This visual guideline document is therefore an attempt to develop a 'best practice' approach for visual specialists, EIA practitioners and authorities involved in the EIA process. The term '**visual and aesthetic**' is intended to cover the broad range of visual, scenic, cultural, and spiritual aspects of the landscape; however, for the purpose of brevity, the term '**visual**' is used in the text' (p 1). **Thus it includes aspects of "the area's sense of place, ... natural and cultural landscapes, ... the identification of all scenic resources, protected areas and sites of special interest, together with their relative importance in the region, ... the need to include both *quantitative* criteria, such as 'visibility', and *qualitative* criteria, such as landscape or townscape 'character' (pp 1-2).**

#### 3.4.5 South African National Heritage Resources Act, 1999 (NHRA)

NHRA regulations cover the protection of historic sites, objects, buildings and landscapes. It covers (ii) "archaeological items," namely, "material remains resulting from human activity... older than 100 years;" rock art, wrecks and "features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found (2 Definitions). The Definitions also include the term "(vi) 'cultural significance' [which] means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance." Further, (xxi) "'living heritage' means the intangible aspects of inherited culture, and may include: cultural tradition oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships." (xxxi) "'Palaeontological' means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace." (xxxviii) "Public monuments and memorials" and (xviii) "victims of conflict" relating to wars are also defined. A linear development over 300m long, or a bridge 50m long, or any development over 5,000 square metres (½ Hectare), or rezoning over 10,000 square metres (1 Hectare) requires an HIA to be submitted if a heritage resource is likely to be affected.

A Heritage Impact Assessment is being undertaken in terms of the provisions of Section 38 (8) of the NHRA.

### 3.4.6 PGWC Guideline for Involving Heritage Specialists in EIA Processes (Edition 1, June 2005)

Continuing on from the NHRA (1999), this now legally adopted Provincial Guideline further records (p 3): “Types of heritage resources as defined in the relevant legislation may include the following:

- Places, buildings, structures and equipment of cultural significance
- Places to which oral traditions are attached or are associated with living heritage
- Historical settlements or townscapes
- Landscape and natural features of cultural significance
- Geological sites of scientific or cultural importance
- Archaeological and palaeontological sites
- Graves and burial grounds
- Sites related to the history of slavery (NHRA).”

These are the so-called “tangibles” of the heritage concept (p 5). Thus the “cultural landscape” is seen as having a range from Archaeology to Palaeontology to Historical Architecture to Social History to Public Memory and Natural Landscape (p 6). Two categories of heritage significance/sensitivity are used: Category 1: Formally protected heritage sites and Category 2: Landscapes of recognised or potential significance or sensitivity (not yet formally protected) (p 18). This extensive list of sites include Grade I-III, National and Provincial Heritage Sites and Protected Areas, as well as Provisionally Protected Sites, Urban Conservation Areas, Nature Reserves, proclaimed Scenic Routes, etc as well as World Heritage Sites e.g. Robben Island and Cradle of Humankind (Sterkfontein). A very large list of landscapes is also included starting with Scenic/Historical Routes or Landscapes, Pristine Natural Areas e.g. Cedarberg and many other types of landscapes including Historic Farm *Werfs* e.g. *Boschendal, Morgenster, Alphen*, and historical farmlands e.g. Winelands, Swartland, Karoolands, and many more.

This long list has been ordered into twelve types of Heritage Context in Table 1 (pp 21-27), namely:

1. Palaeontological Landscape
2. Archaeological Landscape
3. Historical Built Urban Landscape
4. Historical Farmland
5. Historical Rural Town

6. Pristine/Natural Landscape
7. Relic Landscape
8. Burial Ground and Grave Site
9. Associated Landscape
10. Historical Farm *Werf*
11. Historical Institutional Landscape
12. Scenic/Visual Amenity landscape.

Many of these could be grouped under the broad term Regional Cultural Landscapes (p 31). **Thus the Landscape is considered a vital part or domain of Heritage Resources.** As a visual resource, Landscape is very much seen and perceived in every human sense.

#### 3.4.7 Other Documents

Other documents that refer to visual aspects of EIA include *Aide Memoir for the Preparation of Environmental Management Programme Reports for Prospecting and Mining* 5.2.13 Sensitive Landscapes and 5.2.14 Visual Aspects which states: "Describe the impact the project will have when viewed from scenic views, tourist routes and existing residential areas" (pp 17-18). The SAMOAC (South African Manual for Outdoor Advertising Control) controls also specifically define visual impact with particular reference to signage in natural, urban and rural landscapes.

### 3.5 Administrative Framework

#### 3.5.1 Western Cape Provincial Urban Edge Guideline (DEA&DP December 2005)

This document notes the following on visual impact that has special reference to this and all similar types of development, bold added (p 30):

**"Visual impact. The value of the environment is often under-estimated from a visual perspective.** It is the visual quality of the environment that, to a large degree, generates the attraction for the tourism industry and draws people to certain areas as desired locations for living a lifestyle outside of the large cities and densely developed urban areas. **The visual resources of rural areas, such as scenic landscapes and the cultural streetscapes and farmsteads,** and environments such as the Garden Route, constitute major tourist attractions. Visual qualities of the environment also forms the backdrop to most other tourist activities, such as 4 x 4 routes, hiking trails, camping and recreational activities and even sporting facilities that sustain local economic activity. The growth of golf resorts in the Garden Route serve as examples of the attraction of the environment and more particularly the visual environment for interest in sporting facilities. Added thereto, the experience of reserves and resorts in the Cedarberg and Karoo are as much in the visual quality of the environment as it is in the attraction of the facilities.

**Each area has its own unique visual character and atmosphere, which plays an important role in the quality of any tourist experience. The diversity of the landscapes makes it essential to consider all development and more particularly the expansion of urban areas, an issue that requires special consideration. The intention is to manage urban development in such a way that no development would detract from the visual quality of the environment and that all development conforms to a characteristic style and urban form that suits the character of the area.”**

This implies that edge development should not only be limited to certain areas through inclusion or exclusion, **but that edge development should also be subject to urban design guidelines, architectural consideration and general aesthetic treatment.** The visual quality of the environment is not limited to the natural environment. **The built environment has as much of an effect on the aesthetic appeal of an area as has the natural environment.”**

### 3.5.2 Western Cape Provincial Spatial Development Framework

A Draft Interim Report to Council is available ex the web dated November 2005 as prepared by CndV Africa. The Western Cape Provincial SDF (WCPSDF) makes no specific discussion of the area around Hermanus as pertains visual impact, however, the following general issues apply.

The report's section 4.1.4 Topography, Visual Amenity and Architectural Style (Scenery), notes in their introduction (p 4-23): **“The impact of human activity has had a pronounced impact on the natural landscape and the need to manage and control such impacts are key to protecting the scenic qualities and visual resources of the Province.”** They further note that visual carrying capacity is higher in undulating landscapes and we could add, in areas with numerous valleys and local ridgelines that screen off one area from the next. However, flat ground, or titled ground that offers a sweeping view is the most visible. Their report goes on to say in the section Visual Impact, Layout and Style (p 4-24):

The visual impact of urban settlements, structures and activities within different environments should enhance and respond to the natural environment and built heritage in which they are located. **This raises the issue of appropriate layout and architectural character within the Province.**

As much as they lament the concern about the impact of globalised styles such as Tuscan that is so foreign to the Cape, the lack of due care to traditional planning forms can also be endorsed. Scenic routes including the N1, N2, N7 and N12 along with mountain passes are broadly accepted as provincial and national assets. In their Spatial Summary they finally note the following:



- The topography and settlement patterns of the Western Cape resulted in a unique matrix of Romantic, Cosmic, Classical and Complex landscapes, ranging from the complex landscape of the City of Cape Town to the cosmic landscape of the Central Karoo. Human settlement needs to be understood in the context of the natural place that 'contains' them and therefore it is important that **more emphasis is put on defining guidelines for the appropriateness of different forms of human settlement within different landscapes;**
- **Areas with exposure to large numbers of people, especially passing tourist traffic, require special consideration; and,**
- **The preparation of guidelines for site planning and choice of building materials and their implementation, including settlement on farms need to be prioritized, especially in areas identified as pure cosmic, romantic or classic landscape areas (for example the Tulbagh Valley) and Scenic Routes.**

**3.5.3 Western Cape Provincial Urban Edge Guideline (DEA&DP December 2005)**

This document makes wide (14) mention of heritage resources recommending for cultural/heritage resources: **"Wide buffer to allow meaningful experience of the resource."**

**3.5.4 Stellenbosch SDF (2007)**

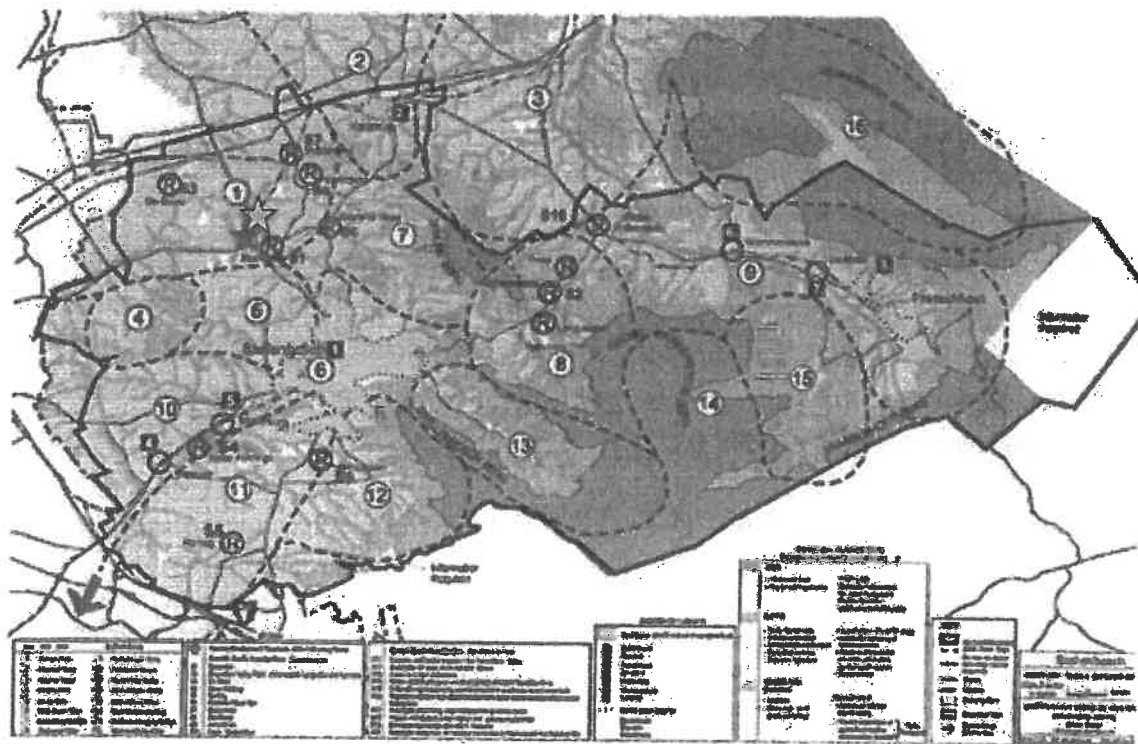


Figure 3-1 Stellenbosch Municipal Spatial Development Framework

Centre of the planning and design CC.  
 and the planning landscape (2007) 1:100,000

Stellenbosch SDF (2007) 1:100,000  
 December 2007

Source: Reproduced courtesy of CnDV Africa Planning and Design CC.

Figure 3-1: Stellenbosch Municipal SDF (2007) showing the site location (yellow star above red star).

An extract of the Stellenbosch SDF is shown below showing the location of the site. It shows the site located on the R304 just above Koelenhof. In the plan of December 2007 the site occurs just outside the northern boundary of the urban edge of Koelenhof.

The Stellenbosch SDF shows that Calcutta 29 occurs in the **hatched tan area = Agriculture (Transition) Bioregional Planning Zone** which covers most of the region in the West and NW of the Stellenbosch municipal area. Numerous **riverine courses** are also indicated as long green lines and one **Buffer Zone = light green hatch** near the Red Star.

The Stellenbosch SDF (p 9) *Synopsis: Heritage* notes the following (**bold added**):

#### HERITAGE

The sense of place of the Stellenbosch region is derived from a long agricultural and academic history coupled with well-preserved architecture and endemic biodiversity. Uncontrolled expansion of urban areas and industrialised agriculture into indigenous ecosystems threatens the unique fabric of the region, and may diminish the appeal of the area. **Several specific principles are proposed to protect the character of the area, including the use of guidelines for sensitive biodiversity areas, controls over building heights and architectural styles along major roads, and the determination of appropriate land use zoning according to view sheds.** The character of the rural area should be protected via various guidelines such as setting buildings along provincial roads back by at least 100m. Tourism that reinforces the municipality's sense of place should be encouraged and attractions should be developed that remain appropriate to the region's well-established themes.

Following the principles introduced in Section 2, Section 3 considers the 14 nodes that have been identified as the loci of future development in Stellenbosch Municipality in more detail. This includes a summary of the challenges and opportunities faced by each node and maps of the status quo and proposed developments that indicate how this could be translated into more detailed spatial plans. Table 1 on page 12 summarizes the key infrastructure capacity issues that need to be addressed in each of the nodes, and can be used to prioritize infrastructure investments across the municipality in the short term.

Furthermore, *Section 7: Heritage* (pages 32-33) later notes more completely (**bold added**):

#### 7. HERITAGE

**Stellenbosch's sense of place is derived primarily from its historic architecture, endemic biodiversity and the views from its main arterial routes. Its main attractions include wine farms, natural areas, historic sites and museums, sports and recreational facilities, and tight-knit urban street character in many of the historic urban cores (e.g. Stellenbosch, Franschoek).** Approximately 169,000 tourists visited the municipality's tourism bureau in 2005, of which over 80% were foreign. Growth in domestic tourism is seen as an opportunity to expand the tourism

economy. The establishment of Stellenbosch 360 in 2012 clearly marks the start of a new era in tourism promotion and business involvement in development in general.

Stellenbosch is home to some of the rarest and most diverse vegetation on earth, but this is coming under pressure from the uncontrolled expansion of urban areas and industrialized agriculture into indigenous ecosystems. As pockets of untouched ecosystems get smaller and the spaces between them get wider, they lose their ability to function and reproduce, and species become extinct. Combined with climate change, uncontrolled conversion of rare ecosystems could result in the loss of beneficial ecosystem services and significantly diminish the appeal of the area unless decisive action is taken to protect and nurture endemic biodiversity.

There is increasing importance of telecommunications to the growth of the economy. This is especially the case in Stellenbosch that has a strong emphasis on business services and information communication technology. Rapid expansion of the telecommunications industry in recent years has resulted in an increasing demand for radio telecommunication services, and new technologies in the cellular phone industry. The location, siting and development of TMI continues to be an issue of particular interest to both local communities and local government alike, with debate focusing on adequate availability of connectivity, visual amenity and public health. With the nature of technology it must be accepted that the future need for TMI sites will increase in the short to medium term.

#### PRINCIPLES

- Sensitive biodiversity areas should be mapped, and clear and appropriate guidelines introduced to conserve them.
- Crest lines should be kept free of buildings and intensive agriculture to protect biodiversity.
- Ridge lines should be used for properly managed walking trails to increase recreational potential, tourism and income.
- The boundaries of view sheds along major routes should be determined by a visual resource management exercise.
- Land within these view sheds and outside of existing or proposed settlement nodes should be classified as either "Buffer" or "Intensive Agriculture" Spatial Planning Categories (SPCs) depending on the underlying land's suitability and use.
- Development for agricultural or agri-tourism activities within these view sheds and outside of existing or proposed settlement nodes should be limited to 1 du per 10 ha (or equivalent).
- Buildings along provincial roads should be set back at least 100m from these roads to preserve the character of rural areas.
- Building heights and architectural styles should be controlled within 200m of any prominent road so as to preserve the heritage of the built environment.

- Outside of formal conservation areas, land-owners should be encouraged to conserve vegetation classified by SANBI as Endangered or Critically Endangered (particularly along ridge lines) and to link to existing conservancies (e.g. through the Cape Nature Stewardship Program). These land-uses should be classified in the Core SPC.
- Adopt a telecommunication mast infrastructure policy that will facilitate the growth of new and existing telecommunications systems and facilitate the provision of TMI in an efficient, cost-effective, environmentally appropriate and sustainable way.
- Tourism that reinforces the municipality's sense of place (e.g. agri-tourism, wine tourism and eco-tourism) should be encouraged in the settlements and on rural land outside the urban edge.
- Variety in the region's tourism offerings should be preserved rather than focused on one unique resource (e.g. wine tourism), but attractions must remain appropriate to the region's tourism themes.
- Restaurants, wine tasting and holiday accommodation should be encouraged, but must be within the parameters of the rural housing guidelines and provincial resort guidelines.



Figure 3-2 Study Area

City of Stellenbosch Planning & Design CC  
 Municipal Planning, Infrastructure and Urban Design

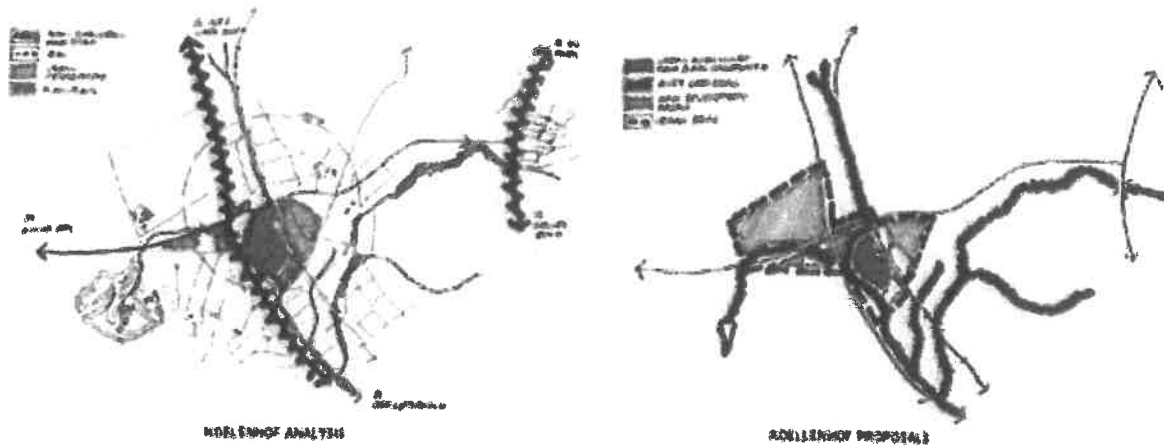
Reproduced by permission from the City of Stellenbosch  
 December 2007

Source: Reproduced courtesy of CNDV Africa Planning and Design CC.

Figure 3-2: Koelenhof SDF study area (2007) showing the site location (yellow star).

The location of the Calcutta site is just north of the 1km urban boundary on the road to Cape Town and the N2 (see Figure 3-2). Nothing is planned outside Koelenhof around Calcutta 29 leaving it rural-agricultural. Its heavily wooded nature is distinctive in the otherwise open agricultural field landscape.

The Koelenhof proposals do not affect the *Calcutta 29* site.



Source: Reproduced courtesy of CNdV Africa Planning and Design CC.

Figure 3-3: 3.9 Koelenhof Analysis and Proposals (Stellenbosch SDF 2007:55).

### 3.5.5 Stellenbosch Heritage Survey and Management Plan (SHS&MP) (2018)

Further information about the area generally can now be gleaned from this excellent survey recently completed and published online. It is referred to by abbreviation SHS&MP in this report. This is powerful and invaluable resource provides at long last an authoritative and comprehensive survey of heritage resources in this heritage rich municipality, making it easier to determine the heritage context of developments.

#### Appendix 5: Landscape Character Study<sup>4</sup>

##### Graded Landscape Units

SHS&MP's *Appendix 5: Landscape Character Study* is invaluable to appreciating the heritage significance of landscape sites such as that at *Calcutta 29*. The Stellenbosch Inventory divides the region up into various zones (see Figure 3-4).

*Calcutta 29* occurs in the NW Landscape Character zone **A Krom River**. The site lies on its NW boundary with the next zone **B Bottelary Hills** (see Figure 3-5).

The grading of this area, on Landscape Units **A11 Calcutta and open fallow ground** and **A12 Cultivated Vineyards** is **Grade IIIb**, which abuts onto the **Grade IIb Landscape Unit: A09 Elsenburg**. Further east and south of Elsenburg, are **Grade IIa Landscape Units A14 Groenhof**

<sup>4</sup> Liana Jansen and Fabio Todeschini (2018). *Appendix 5: Landscape Character Study in Stellenbosch Heritage Survey and Management Plan (2018)*. Stellenbosch Municipality.

**Muratie and Knorhoek and A16 Gateway to Krom River, With Grade IIb A15 Skurweberg Footslopes** in between. Land over the R304 to the west is not graded but zoned **NCW Land Parcels in the Stellenbosch Winelands** (see Figure 3-6).



Source: Appendix 5 in SHS&MP (2018).

**Figure 3-4: Landscape Character Zones showing Calcutta 29.** Calcutta 29 occurs in A Krom River zone and is clearly visible in its wooded character (to the left of the label A Krom River).

The Stellenbosch Municipality Heritage Inventory Map is shown in Figure 3-5 below.

#### **Graded Heritage Sites**

While there are numerous **Grade IIIc** sites in the Krom River Valley, there are also a number of **Grade IIb** sites. These are not named on the maps but have to be found on the interactive online map.<sup>5</sup> There are 4 sites at Elsenburg:

- **The nearest is Elsenburg Plumvee Proefplaas, Grade IIIa**
- **Elsenburg itself, Grade II**
- **Immediately adjacent, Elsenburg Pear Grove, Grade IIIc**
- **Elsenburg, Grade II to the south.**

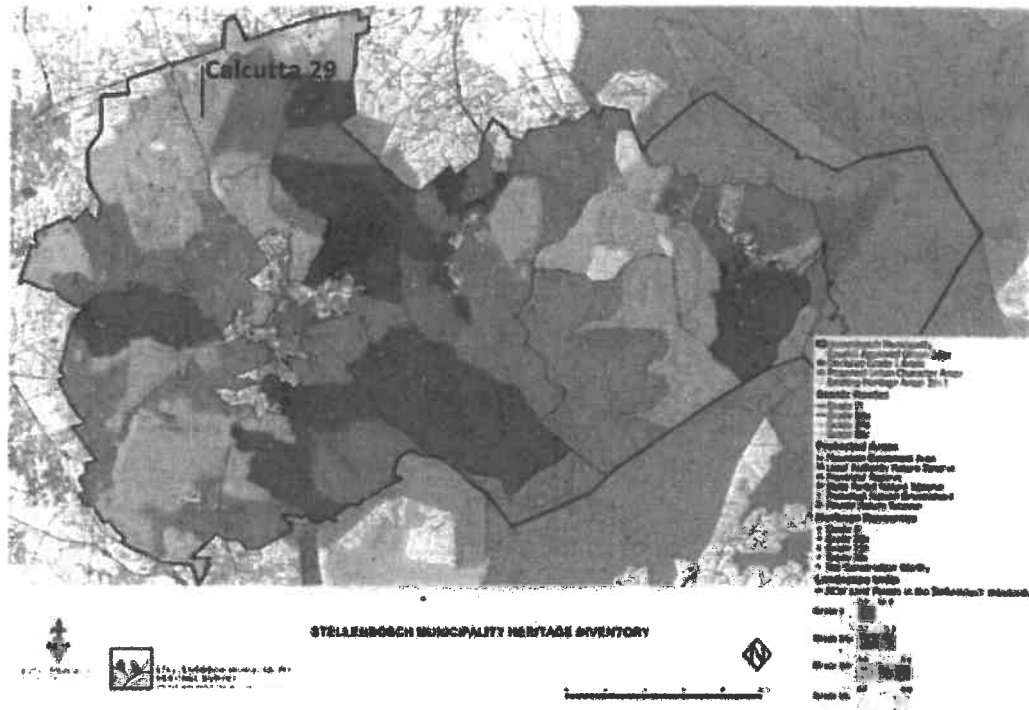
The nearest graded wine farm is:

- **Simonsig, Grade IIIc.**

Ungraded resources over the R304 northwards include:

<sup>5</sup> <http://stellenboschheritage.co.za/smhs/map/#13/-33.8508/18.8097>.

- **Wild Clover**
- **Pete's Adventure Farm Cottages**
- **Koelenhof Wynkelder.**



Source: Appendix 5 in SHS&MP (2018).

Figure 3-5: Stellenbosch Municipality Heritage Inventory Map (2018).

This map shows the overall context of heritage sites and landscapes and their grading. Calcutta and surrounds are ranked Grade IIIb.

#### Graded Scenic Routes

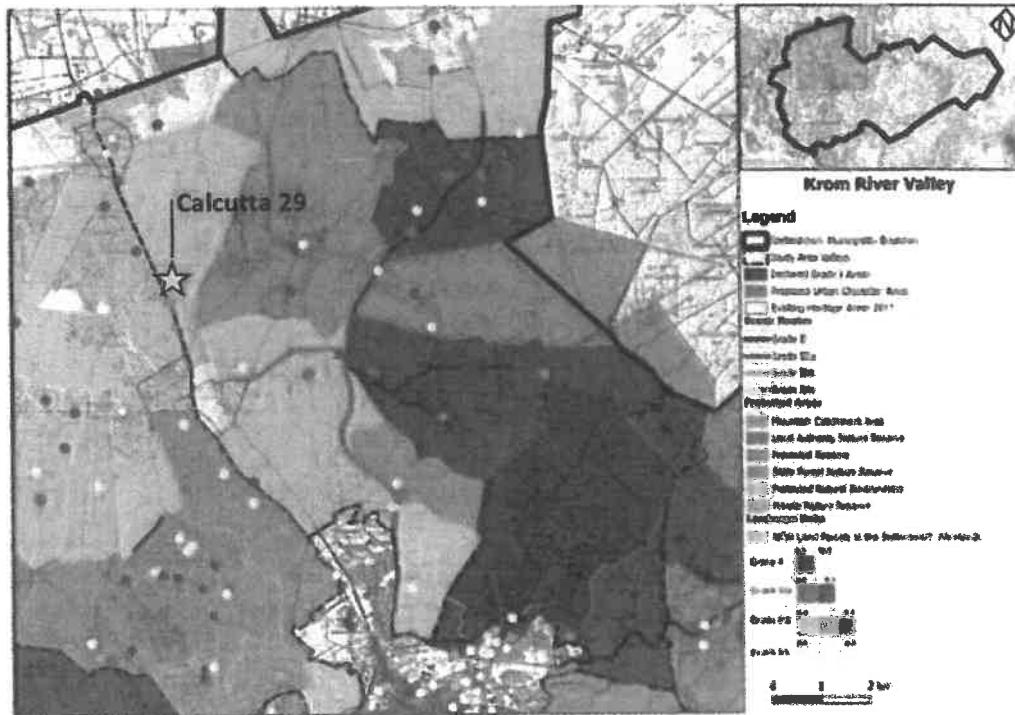
The R304 running on Calcutta 29's western boundary has no ranking as a scenic route, however, the network of roads to the east behind Elsenburg are given **Grade IIIa** and even **Grade II** rankings. They are not visible from the site.

#### Landscape Character Areas: Krom River Vlaktes

The Landscape Character Zones of the SHS&MP are further divided into **Landscape Character Areas**. Calcutta 29 falls into **A11 Krom River Vlaktes**. They are described in the following extract from Appendix 5 (see Figure 3-7). While it is an area with "development potential" due to low overall grading, "some of its highlights include the Calcutta Outspan with attractive open fallow land and large remnant oak trees next to it (A11)" (ibid). They also note "it has expansive views back towards the Stellenbosch mountains" (ibid).

The Krom River Vlaktes are mostly characterised by low undulating plains on the northern boundary of the Stellenbosch Municipal area. This landscape unit scored low in the evaluation process and presents an area with development potential. It is close to the N1 and has ex-

pansive views back towards the Stellenbosch mountains. Some of the highlights include the Calcutta outspan with attractive open fallow land and large remnant Oak trees next to it (A11). The smaller blocks of well-maintained vineyards in land unit A12 are an important transition area into and out of the Stellenbosch winelands.



Source: Appendix 5 in SHS&MP (2018).

**Figure 3-6: Stellenbosch Municipality Heritage Inventory Map: A Krom River Valley (2018).** This map shows the overall context of heritage sites and landscapes in the Krom River zone and their grading. **Calcutta 29 is zoned as a Grade IIIb Landscape with a Grade IIIb Heritage Site on the southern corner at the old Outspan site.** They are both ranked as 6 (medium orange), the mid Grade IIIb forming part of the grading of that area



A Krom River Landscape Unit Rating		Item Weight	A11 Value	A11 Weighted value	A12 Value	A12 Weighted value	A13 Value	A13 Weighted value
Ecological	Protected areas 10 Critical Biodiversity area 9 Ecological support areas 7 agriculture 4 Urban 1	20%	8	1.6	8	1.6	7	1.4
Aesthetic	Viewshed, Scene, Diversity, enclosure unity, colour, texture, balance proportion, form	20%	8	1.6	7	1.4	4	0.8
Historic	Age, Pattern, representivity and association, rarity, condition	25%	6	1.5	3	0.75	4	1
Social	Meaning and cultural associations Church, School, Creche, recreational community	10%	3	0.3	3	0.3	5	0.5
Economical	Tourism and agricultural potential High soil suitability 9 medium soil suitability 7 fragmented 5 Disturbed 2	25%	5	1.25	6	1.25	5	1.25
Degree of acceptable		100%		6.25		5.3		4.95

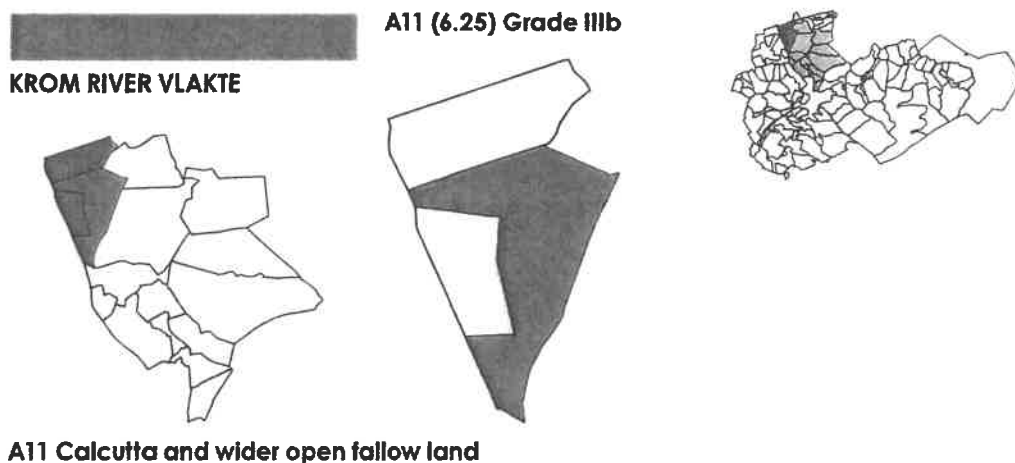
NCW	0-2	
Grade 3c	2 to 4.9	
Grade 3b	5 to 7.9	
Grade 3a	8 to 10	
Grade 2	8.5 to 10	

Source: Appendix 5 in SHS&MP (2018).

Figure 3-7: Stellenbosch Municipality Heritage Inventory Map: Krom River Vlaktes (2018). A11 Krom River Vlaktes scores 6.25 points = Grade IIIb.

**A11 Calcutta and Wider Open Fallow Land**

The specific detail for Calcutta is noted in unit A11 with the map area found below (see Figure 3-8).



Source: Appendix 5 in SHS&MP (2018).

Figure 3-8: Stellenbosch Municipality Heritage Inventory Map: A11 Calcutta etc (2018). A11 Krom River Vlaktes scores 6.25 points = Grade IIIb.

The description of A11 Calcutta and surrounds is as follows (**bold added, ibid**):

**A11 Calcutta and wider open fallow land**  
 An active railway line and Muldersvlei station are located in the northern section of this landscape unit with another railway line forming the eastern border. Its presence, however, does not have an adverse impact on the rolling, fallow agricultural land character of most of the unit. The R101 represents the northern border, and two businesses are located along it. The Giraffe

House on the corner of the R101 and R310 features some small camps with wild animals such as giraffe, ostriches and antelope species. It has a negative influence on the visual character of the area. A chicken farm is located adjacent to this property. The southern corner of the land unit has an historic outspan area that features a remnant plantation on a distinctive triangular-shaped piece of land called Calcutta Bos. This outspan has landmark and associative significance and is highly regarded by people living in the area. Highlights of this land unit are the beautiful remnant Oak trees found on open fallow land and the small stream next to the historic Outspan area.

This landscape unit has historic and associative significance in an area with a valued rural quality, and any development will compromise its inherent rural character.

### 3.6 Strategic Issues

#### 3.6.6 Strategic Assessment

One of the difficulties of assessing visual impact at present is the lack of strategic Provincial or Municipal EIA, VIA or HIA studies which provide guidance on how the individual project fits into the overall context of development in any region. While an individual project seems to have an acceptable level of mitigatable impact, when viewed collectively, their sum total can well exceed the sum of the parts. That is, the impact of a single scheme such as this development may seem to be minimal when considered in isolation; however, when seen collectively with other developments also proposed in the area or region but as unknown to the assessor, or as not considered over the long term, the overall impact can become unsustainable. These are cumulative impacts.

There are no strategic visual studies done of the area that we are aware of but the SHS&MP's *Appendix 5: Landscape Character Study (2018)* (see section 3.5.5 above) has gone some way to informing the value of the landscape from a scenic and heritage perspective. However, it is not possible to consider strategic issues in detail at the project level as the information is generally not available and it is outside the scope of project assessments to do so.

NWA

## 4 Visual Environment Description

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### 4.1 Summary

The site lies adjacent to the R304, which is not a designated scenic route. The route is of mixed scenic value, more so on the southbound journey with open views to the mountains. The landscape is generally open and flat with a mixed agricultural feel of open pastures, vineyards and some agricultural technology developments. The site itself is covered with dense, immature gum plantation making views into the site very short. The site cannot be easily seen from other roads, if at all, and neighbouring farms alone would be able to access it on north, east and south boundaries.

### 4.2 Introduction

Combined with Section 2, this chapter presents the relevant visual data required to develop a Visual Impact Assessment. This is a strongly visual chapter well illustrated with site and regional photographs. Visual impact is all about what can we see and how this affects us. This chapter shows us what we can see.

#### 4.2.1 Background

The description of the environment is undertaken with a view to presenting basic data for the VIA. A full presentation is made of the visual information collected and analysed as required for a Level 4 VIA.

#### 4.2.2 Key Issues

1. The R304 is a semi-scenic but non-graded route from the N1 into Stellenbosch.
2. The site occurs on the Krom River Vlaktes/Flats and is flat to gently sloping away to the Plankenburg River.
3. The vegetation in the area is highly transformed from its original fynbos/renosterveld leaving a degraded grassy pasture landscape and vineyards.

4. The site itself is covered with gum plantation of mixed ages, possibly burnt out and re-sprouting, and is very bushy compared to the generally open grassland around.
5. The site itself is some 30 hectares and sight of it is soon lost by the dense gum trees as you near its boundaries be they fields or the highly trafficked R304.

### 4.3 Physical Environment

#### 4.3.1 Location

The site lies in an extensive area of farmland in the NW region of the Stellenbosch Wine-lands. There are numerous well-known wine farms in the area. Elsenburg Agricultural College lies to the east of the site over the railway line.



Source: Courtesy of Chief Directorate: Surveys and Mapping, State Copyright 2000 / New World Associates.

**Figure 4-1: Site and Photographic Locations 1:50,000.**

Portion of a 1:50,000 map of South Africa (3318 DD Stellenbosch, 5th Edition 2000) showing the site's location (yellow colour) and photographic locations (blue cameras). NTS.

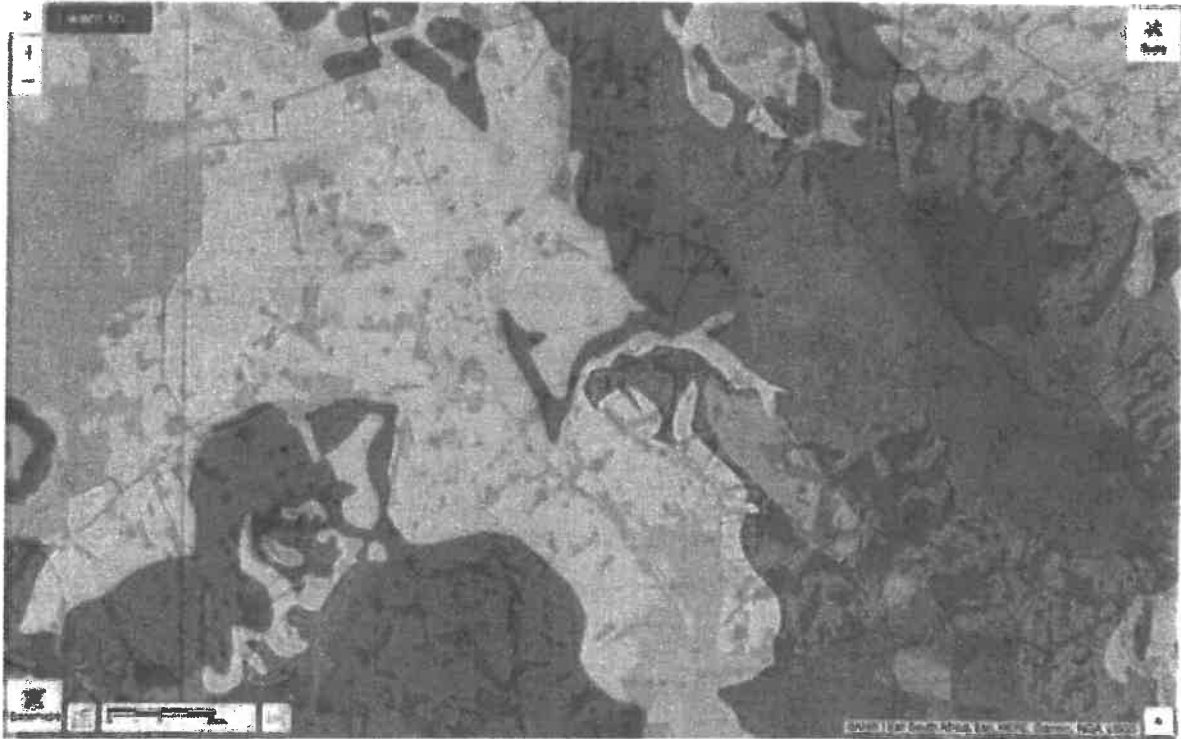
#### 4.3.2 Landform

The landform on site is flat to gently sloping away to the east down to the Plankenburg River. The landscape becomes more gently rolling to the south towards Stellenbosch.

## 4.4 Biological Environment

### 4.4.1 Vegetation, Wildlife and Ecology

The vegetation on site is classified as FRs 9 Swartland Shale Renosterveld. This is probably highly degraded now into pasture land by overgrazing and fire.<sup>6</sup> Whatever remains of the natural vegetation is obscured by the gum plantation. There is also dense invasive *Acacia saligna*, especially in the south.



Source: VEGMAP 2012 (SANBI, 2006-).

Figure 2: Vegetation Map of the site Calcutta 29 in the NW Stellenbosch area (NTS).

### 4.4.2 Conservation and Management

**Swartland Shale Renosterveld is ranked as Critically Endangered.<sup>7</sup>**

<sup>6</sup> **Conservation:** This is a critically endangered vegetation unit. Target 26%, but since 90% of the area has been totally transformed (mainly for cropland), the target remains unattainable. The remnants are found in isolated pockets, usually on steeper ground. So far only a few patches have been included in conservation schemes (e.g. Elandsberg, Paardenberg). Aliens include *Acacia saligna* (very scattered over 65%), *A. mearnsii* (very scattered over 62%) as well as several species of *Prosopis* and *Eucalyptus*. Alien annual grasses of the genera *Avena*, *Briza*, *Bromus*, *Lolium*, *Phalaris* and *Vulpia* are a primary problem in remnant patches. Other serious aliens include herbs such as *Erodium cicutarium*, *E. moschatum*, *Echium plantagineum* and *Petrorhagia prolifera*. Erosion very low and low. (VegMap online accessed 12 November 2018).

<sup>7</sup> South African National Biodiversity Institute (2006- ). *The Vegetation Map of South Africa, Lesotho and Swaziland*, Mucina, L., Rutherford, M.C. and Powrie, L.W. (Editors), Online, <http://bgis.sanbi.org/SpatialDataset/Detail/18>, Version 2012.

## 4.5 Social Environment

### 4.5.1 Heritage

The Cape Winelands are world renown and are a UNESCO World Heritage Site. The development of the Winelands into a cultural landscape occurred historically during the colonial period of South Africa from the seventeenth to nineteenth centuries. The twentieth century saw expansion and further development of the winelands and the development of the region's famous Wine Routes. There are numerous well-known Stellenbosch wine farms in the area including *Koelenhof* and *Simonsig*. As such this rural landscape is highly transformed with farms either given over to vineyards or pasturage. There are also numerous farm dams.

### 4.5.2 Land Use

As noted in the WCPSDF previously, the site falls is zoned rural Agricultural.

### 4.5.3 Rural Context

The site occurs in the rural landscape of NW Stellenbosch Municipality, an area of the winelands.

## 4.6 Cultural Environment

### 4.6.1 Aesthetics

The area's aesthetic is mixed agricultural with a combination of vineyards and pasturage. There is more pasturage in this area than vineyards. However, the greater landscape is the historical winelands of Stellenbosch.



Source: All photographs in the report by Bruce Eitzen and are copyright ©.  
 Photograph 4-1: View across the rolling pastures towards Elsenburg with Klapmuts Kop behind, the site at left.

### 4.6.2 Visual

The site has been the subject of a photographic survey that looks at the site itself, the local area and views from local roads. The bulk of the visual description is to be found in the photographs that are self explanatory and accompanied by descriptions. **According to the PGWC Guidelines "the term 'visual and aesthetic' is intended to cover the broad range of visual, scenic, cultural and spiritual aspects of the landscape; however, for the purpose of brevity, the term 'visual' is used in the text" (p 1).** Thus it is within the technical gambit of VIA to

comment on all the varied aspects that make up the visual environment which is the aim of this study. The photographic survey is presented as if one were to visit the site for the first time, covering views from the approach road, scenic routes, local roads, views of and from the site then views from the neighbourhood.

#### 4.6.3 Views of the Site from the R304

The following view sequence is taken travelling north from Koelenhof towards the N1.

The northbound route is less scenic coming out of the mixed landscape around Koelenhof and Stellenbosch with nothing on the horizon of interest as the ground climbs to the north.



Photograph 4-2: Northbound on the R304 from Koelenhof intersection (left) and passing the site (right).



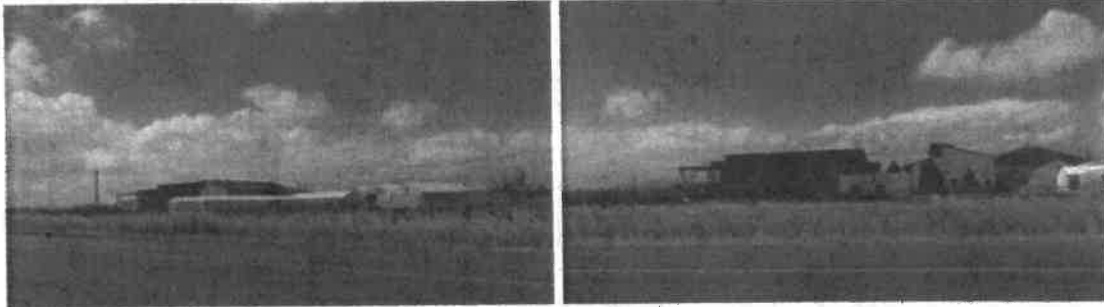
Photograph 4-3: Northbound on the R304 past the gum trees on site mixed with alien *Acacia saligna*.



Photograph 4-4: Northbound on the R304 past the northern end of the site (left) then past a vineyard (right).



**Photograph 4-5: Northbound on the R304 north of the site past nearby farms.**



**Photograph 4-6: Northbound on the R304 past Westcape Biotech (Pty) Ltd.**

The site occurs on an open plain known as the Krom River Vlakte. Its bushy gum plantation stands out from the generally open landscape.



**Photograph 4-7: Northbound on the R304 and the open Krom River Vlakte landscape, Klapmuts Kop behind.**



**Photograph 4-8: Southbound on the R304 looking towards Simonsberg and the Stellenbosch winelands.**





Photograph 4-9: Southbound on the R304 from Westcape Biotech (left) and the lunch time traffic (right).



Photograph 4-10: Southbound on the R304 past vineyards towards the Stellenbosch mountains.

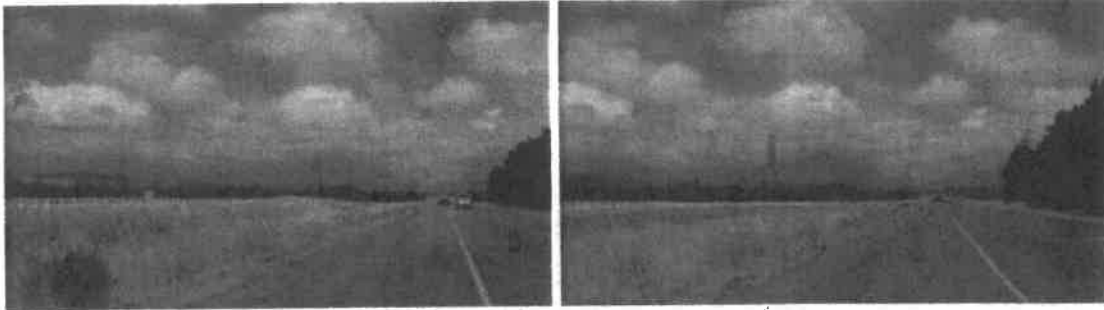


Photograph 4-11: Southbound on the R304 with the site just coming into view at left past the Vrede vineyards.



Photograph 4-12: Southbound on the R304 past Vrede Winery (left) with boundary trees (right).

**The views along the R304 are more scenic on the southbound route as the mountains around Stellenbosch form the backdrop and the landscape falls away into the Stellenbosch valley.**



Photograph 4-13: Southbound on the R304 past Vrede Winery and the site coming into view.



Photograph 4-14: Southbound on the R304 approaching (left) and passing the site's gums (right).



Photograph 4-15: Southbound on the R304 passing the site's gums (left) and neighbouring open field (right).



Photograph 4-16: Southbound on the R304 passing the site's southern boundary (right) with open fields (left).

#### 4.6.4 Views of the Site

The following views are taken adjacent to the site from the R304, the most significant views for visual impact assessment. Views from neighbouring farms on other boundaries were not accessible.



**Photograph 4-17: View of the southern boundary of the site from the R304 showing the old outspan location.**



**Photograph 4-18: View of the western boundary of the site from the R304 showing the typical view from the road.**

**The Calcutta Bos site is heavily wooded though only semi-mature gum plantation. The neighbouring landscapes are mostly open pasture. Visibility into the site is low.**

**This concludes the visual description of the study area. A visual assessment of the site follows in the next chapter.**

NWA

## 5 Visual Impact Assessment

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### 5.1 Summary

The R304 is only moderately scenic, particularly southbound and runs adjacent to the site's west boundary. The flatness of the site and its dense gum plantation blocks views into the site while indicating its location generally in the open landscape of fields and vineyards. The proposed development will have a moderate impact on the landscape causing some change to the visual environment. The development has moderate to high visual exposure, moderate visual absorption capacity, medium compatibility, and is moderately to highly visible (R304). The development's visual impact has site-related to local extent, long term duration, medium intensity, definite probability, and medium significance on the landscape. Recommendations are made to minimise visual and aesthetic impact.

### 5.2 Introduction

This chapter uses the information collected in the previous chapters in an analysis that identifies and then describes the preliminary visual and aesthetic impacts of the project on the environment presented in tabular form due to the extent of the project.

**DEFINITION:** "Visual impact is defined as a change in the appearance of the landscape as a result of development which can be positive (improvement) or negative (destruction)" (IEA and the Landscape Institute, 1995).

#### 5.2.1 Key Issues

1. *Calcutta 29* is unusual in that its dense gum plantation stands out from the generally open fields and neat vineyards of the area.
2. The landform of the site is flat sloping gently to the east; the area is generally flat also.
3. Only the nearest western boundary is visible to the road on the R304. All other boundaries occur on private land.

4. While the woodlot helps to identify this farm from the rest, it also makes views into impossible.
5. There are no major ridgelines in the area although there are subtle ones on these extensive flats.

### 5.3 Methodology

A table is being used to scope the issues relating to visual and aesthetic impact of the wind turbines on the landscape.

#### 5.3.1 The Visual Assessment

The visual environment can be structured into the following components:

1. **Natural Environment:** comprising the *Geomorphology* (geology, soil, land form), *Climate* (atmosphere and water), and *Nature* (vegetation and wildlife).
2. **Cultural Environment:** comprising *Land Use* (urban, rural, agricultural, recreational, etc), the *Structures* (architecture, engineering, lighting, services), and *History* (ancient, colonial, modern, contemporary).
3. **Visual Environment:** comprising *Views* (aesthetics), *Routes* (scenic, transport), and *Landscapes* (town, country, cultural, natural, mountainous, coastal, etc).

#### 5.3.2 Triggers for Visual Assessment

These have been extracted from the PGWC (November 2005) list of triggers (p 5) with potential aspects relevant to this project noted in **bold**:

**The nature of the receiving environment:**

1. **Areas with protection status, such as national parks or nature reserves;**
2. **Areas with proclaimed heritage sites or scenic routes;<sup>8</sup>**
3. Areas with intact wilderness qualities, or pristine ecosystems;
4. Areas with intact or outstanding rural or townscape qualities;
5. **Areas with a recognized special character or sense of place;**
6. **Areas lying outside a defined urban edge line;**
7. **Areas with sites of cultural or religious significance;**
8. **Areas of important tourism or recreation value;**
9. Areas with important vistas or scenic corridors;
10. Areas with visually prominent ridgelines or skylines.

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<sup>8</sup> The R304 is not scenic while the scenic routes around Elsenburg do not approach the site closely. The winelands are recognized heritage areas and there are variously graded heritage landscapes and sites in the general area, mostly at Elsenburg.

**The nature of the project:**

1. High intensity type projects including large-scale infrastructure;
2. A change in land use from the prevailing use;
3. A use that is in conflict with an adopted plan or vision for the area;
4. A significant change to the fabric and character of the area;
5. A significant change to the townscape or streetscape;
6. Possible visual intrusion in the landscape;
7. Obstruction of views of others in the area.

As can be seen, the various sites could be described as falling within at least 6 of the 10 listed receiving environments (60%), and 2 out of 7 project types (29%) that may cause visual impact giving a combined total of 45%; the receiving environment is moderately sensitive while the project character is low impact. **Thus the factors triggering potential impact suggest that impact will be moderate while their scope suggests low.** Regarding “the nature of the receiving environment,” categories apply to both the site and the area generally.

**5.3.3 Key Issues Requiring Specialist Input**

The following table helps identify the likely level of impact:

TYPE OF ENVIRONMENT: High to Low Sensitivity	TYPE OF DEVELOPMENT: Low to High Intensity				
	Category 1 development	Category 2 development	Category 3 development	Category 4 development	Category 5 development
Protected/wild areas of international, national, or regional significance	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected	Very high visual impact expected
Areas or routes of high scenic, cultural, historical significance	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected
Areas or routes of medium scenic, cultural or historical significance	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected
Areas or routes of low scenic, cultural, historical significance / disturbed	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected
Disturbed or degraded sites / run-down urban areas / wasteland	Little or no visual impact expected. Possible benefits	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected

Figure 3: Table of Visual Impacts ex DEA&DP Guidelines.

Furthermore, the PGWC “Categorisation of issues to be addressed by the visual assessment” (Table 1, p 6) identifies the project as **Category 3 development**: e.g. low density resort / residential type development, golf or polo estates, **low to medium-scale infrastructure**.<sup>9</sup>

<sup>9</sup> **Category 1 development**: e.g. nature reserves, nature-related recreation, camping, picnicking, trails and minimal visitor facilities.

**Category 2 development**: e.g. low-key recreation / resort / residential type development, small-scale agriculture / nurseries, narrow roads and small-scale infrastructure.

Terms are defined as follows (p 7): *Medium density development* – generally 1 to 3-storey structures, including cluster development, usually with more than 25% of the area retained as green open space.<sup>10</sup> In the list of “Type of environment” this would be defined as a mix of “**areas or routes of medium scenic, cultural, historical significance.**” This would result in a theoretical possible outcome: *moderate visual impact* expected. When considering the following descriptions, we find that the visual impact is perhaps best described as **moderate**:

**“High visual impact expected:**

1. Potential intrusion on protected landscapes or scenic resources;
2. Noticeable change in visual character of the area;
3. Establishes a new precedent for development in the area.

**“Moderate visual impact expected:**

1. Potentially some affect on protected landscapes or scenic resources;
2. Some change in the visual character of the area;
3. Introduces new development or adds to existing development in the area.

**“Minimal visual impact expected:**

1. Potentially low level of intrusion on landscapes or scenic resources;
2. Limited change in the visual character of the area;
3. Low-key development, similar in nature to existing development.”

**“Little or no visual impact expected:**

1. Potentially little influence on scenic resources or visual character of the area;
2. Generally compatible with existing development in the area;
3. Possible scope for enhancement of the area.”

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**Category 3 development:** e.g. low density resort / residential type development, golf or polo estates, low to medium-scale infrastructure.

**Category 4 development:** e.g. medium density residential development, sports facilities, small-scale commercial facilities / office parks, one-stop petrol stations, light industry, medium-scale infrastructure.

**Category 5 development** e.g. high density township / residential development, retail and office complexes, industrial facilities, refineries, treatment plants, power stations, wind energy farms, power lines, freeways, toll roads, large-scale infrastructure generally. Large-scale development of agricultural land and commercial tree plantations. Quarrying and mining activities with related processing plants.

<sup>10</sup> *Low-key development* – generally small-scale, single-storey domestic structures, usually with more than 75% of the area retained as natural (undisturbed) open space.

*Low density development* – generally single or double-storey domestic structures, usually with more than 50% of the area retained as natural (undisturbed) open space.

*Medium density development* – generally 1 to 3-storey structures, including cluster development, usually with more than 25% of the area retained as green open space.

*High density development* – generally multi-storey structures, or low-rise high density residential development.

The following terms are used in the above assessments (p 8):

1. *Fundamental change* – dominates the view frame and experience of the receptor;
2. *Noticeable change* – clearly visible within the view frame and experience of the receptor;
3. *Some change* – recognisable feature within the view frame and experience of the receptor;
4. *Limited change* – not particularly noticeable within the view frame and experience of the receptor;
5. *Generally compatible* – Practically not visible, or blends in with the surroundings.”

**SUMMARY ASSESSMENT—VISUAL IMPACT:** The proposed development will have a moderate impact on the landscape causing some change to the visual environment.

This assessment of the impact is confirmed by the following descriptions of the categories of issues:

#### 5.3.4 Level of Assessment

PGWC (November 2005) defines the selection of the appropriate approach to VIA for a moderate visual impact expected as a **Level 3 Visual Assessment** (p 13). This is defined as follows:

*Approach Type A Assessment: which are relatively large in extent, and involve natural or rural landscapes.*

**Visual impact assessment report by visual specialist qualified in landscape architecture or environmental planning; preferably affiliated to SACLAP.**

*Method:*

1. Identification of issues raised in scoping phase, and site visit;
2. Description of the receiving environment and the proposed project;
3. Establishment of view catchment area, view corridors, viewpoints and receptors;
4. Indication of potential visual impacts using established criteria;
5. Inclusion of potential lighting impacts at night;
6. Description of alternatives, mitigation measures and monitoring programmes;
7. Review by independent, experienced visual specialist (if required);

**A Level 4 VIA for High Impact would require "complete 3D modelling and simulations, with and without mitigation" in addition to the above.**



## 5.4 Visual Analysis

### 5.4.1 Visual Mapping

This has been mapped in Figure 4 and shows the site's visibility as defined by its Viewshed, Zones of Visual Influence and Viewpoint Analysis. Visual Absorption Capacity (or Visual Sensitivity) is not mapped but discussed below. The mapping technique is a traditional, *reflective* mapping or viewshed mapping, which shows where, and to what extent, the site is visible from its surroundings. *Projective* mapping, that is, from viewpoints within the site (inside out) is not required but site views can be seen in the photographs.

### 5.4.2 Key to the Visual Analysis Map

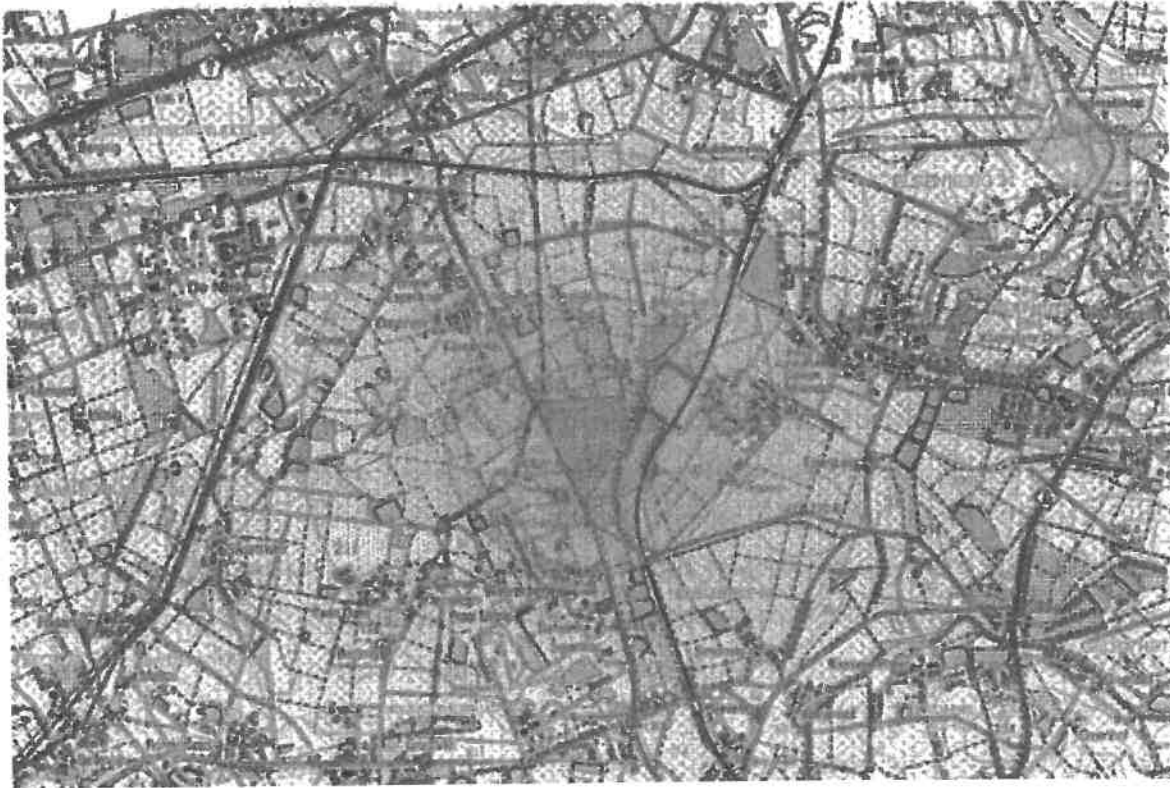
The Visual Catchment is shown as thick brown lines and approximately follows the ridgelines of the mountains and hills. Areas *theoretically* visible to the site (Zone of Visual Influence or ZVI) are indicated in yellow overlain on a radiating circle centred on the site graded from solid blue on the site being most visible to no shading beyond 5km visibility. Combined with the yellow ZVI this produces a blue-green to yellow colour where the site is visible. Areas with no yellow colouring are those where the site is not visible (the view shadow). **It should be noted that the term *theoretically* is significant as it is neither possible nor necessary to physically check all these locations. However, strategic views have been checked according to site inspection and analysis.** Some views that would theoretically be possible are not possible due to ground level screening and the hilly terrain. Urban and suburban buildings and orientation are also important factors in visibility. Radiating circles of concentric rings encompass the site at 1km intervals but including a 250m and 500m circle.

### 5.4.3 Viewshed

The ~~viewshed~~ is indicated by the edge of the yellow zones on the map and either is terminated by **ridgelines** shown in brown or diminishes with distance. The impact of nearby ridgelines is minimal as they tend to be quite subtle changes. The ridgeline about 500m to the south and east is probably the nearest most significant ridgeline limiting views and another one to the north at *Vorentoe* likewise. The top of Klapmuts Kop at 4km distance can also overlook the site on the facing sides at about 400-500m altitude but this is far distant.

### Farm Calcutta 29, Stellenbosch; Zones of Visual Influence (1:50,000)

On site	Close	Near	Middle	Long	Distinct	Far	Distant	Hot	Ridge
Site	Visible	250 - 500	500 - 1km	1 - 1.5km	1.5km - 3km	3km - 5km	5km - 10km	Hot Visible	Ridge Line



Source: New World Associates.

Figure 4: Zone of Visual Influence.

Portion of a 1:50,000 map of South Africa (3318 DD Stellenbosch, 5th Edition 2000) showing the approximate Zone of Visual Influence (ZVI).

#### 5.4.4 Zone of Visual Influence

The **Zone of Visual Influence (ZVI)** is shown in various shades of blue-green and reveals a moderate area of visibility for the site, while the visibility tends to fade into the distance rather than being blocked by landform. However, there are significant avenue/boundary plantings of mostly gum trees to the east, which would tend to block views on that side. The gum plantation on the site itself mostly screens views into the site much beyond the boundary. The corners of the site fall within about 500m of the site's centre so views up to 1km from the boundary are on the 1.5km radius approximately.

#### 5.4.5 Visual Absorption Capacity

The Visual Absorption Capacity (VAC) of the landscape is typically defined by landform, land use and vegetation. In this case, landform applies locally while local vegetation also is a factor.

##### VAC of the Land Form

Landform is not highly significant in this generally flat landscape of the *vlaktes/flats*. However, subtle local landforms north and south are a minor factor.

##### VAC of the Land Use

Land Use VAC is also a factor in places mainly due some fencing in places although this is often planted so see below.

##### VAC of the Vegetation

The area has some significant vegetation VAC as a result of the old gum avenues to the east at/near Elsenburg and along the river there. The site's own dense gum plantation is a major factor affecting visibility on the site beyond its boundaries.

#### 5.4.6 Visual Sensitivity

The area has mixed sensitivity due to the mixed and intensifying land use. While the site and area is predominantly rural with an open landscape of fields and vineyards, the site's gum plantation tends to be rather bushy and unkempt making it less sensitive in itself. Also, there are some semi-industrial/technological buildings in the landscape and an increasing scale of infrastructural intensity such as higher road standards and farm boundary fences and walls.

#### 5.4.7 VIA Criteria and Assessment

The PGWC Guideline (June 2005, pp 18-19) defines Visual Impact Assessment Criteria as outlined following. We have included our assessment of the visual impact here along with the assessment criteria for ease of relating to the complex of terminology:

##### Specific Criteria for VIAs<sup>11</sup>—Visibility

The following analysis presents the specific criteria findings in bold for the project.

**Visual exposure of the area:** the geographic area from which the project will be visible, or view catchment area.

1. **High visual exposure** – covers a large area (e.g. several square kilometres).
2. **Moderate visual exposure** – covers an intermediate area (e.g. several hectares).
3. **Low visual exposure** – covers a small area around the project site.

<sup>11</sup> Note 1: These, as well as any additional criteria, need to be customised for different project assessments. Note 2: Various components of the project, such as the structures, lighting or power lines, may have to be rated separately, as one component may have fewer visual impacts than another. This could have implications when formulating alternatives and mitigations.

**Visual absorption capacity (VAC):** the potential of the landscape to conceal the proposed project, i.e.

1. *High VAC* – e.g. effective screening by topography and vegetation;
2. *Moderate VAC* – e.g. **partial screening by topography (and vegetation);**
3. *Low VAC* – e.g. little screening by topography (or vegetation).

**Landscape integrity:** the compatibility or congruence of the project with the qualities of the existing landscape or townscape, or the 'sense of place.'

1. *Low compatibility* – visually intrudes, or is discordant with the surroundings;
2. *Medium compatibility* – **partially fits into the surroundings, but clearly noticeable;**
3. *High compatibility* – blends in well with the surroundings.

**Visibility of the project:** based on distance from the project to selected viewpoints i.e.:

1. *Highly visible* – **dominant or clearly noticeable (e.g. 0 to 1km)<sup>12</sup>**
2. *Moderately visible* – **recognisable to the viewer (e.g. 1 to 2km);<sup>13</sup>**
3. *Marginally visible* – not particularly noticeable to the viewer (e.g. 2km+);

**SUMMARY ASSESSMENT—VISIBILITY:** The development has moderate to high visual exposure, moderate visual absorption capacity, medium compatibility, and is moderately to highly visible (R304).

The PGWC Guideline further notes: "To aid decision-making, the assessment and reporting of possible impacts requires consistency in the interpretation of impact assessment criteria. Various criteria are defined in the EIA Regulations, such as 'nature', 'extent', 'duration', etc. The interpretation of these criteria for visual assessments is given in Box 11" repeated below:

**Criteria Used for the Assessment of Visual Impacts—Visual Impact Assessment**

Once again, the following analysis presents the specific criteria findings in bold for the project.

**Nature of the impact:** an appraisal of the visual effect the activity would have on the receiving environment. This description should include visual and scenic resources that are affected, and the manner in which they are affected, (both positive and negative effects).

<sup>12</sup> The site is highly visible to the general public on the R304 up to 500m from the site boundary; it is otherwise only easily visible on neighbouring farms in the 0-1km range.

<sup>13</sup> The site is only moderately visible from Elsenburg about 2km distant, the nearest significant heritage location, if it is visible at all.

**Extent:** the spatial or geographic area of influence of the visual impact, i.e.:

1. **site-related:** extending only as far as the activity;
2. **local:** limited to the immediate surroundings;
3. **district:** affecting a smaller urban/rural area;<sup>14</sup>
4. **regional:** affecting a larger metropolitan or regional area;
5. **national:** affecting large parts of the country;
6. **international:** affecting areas across international boundaries.

**Duration:** the predicted life-span of the visual impact:

1. **short term,** (e.g. duration of the construction phase);
2. **medium term,** (e.g. duration for screening vegetation to mature);
3. **long term,** (e.g. lifespan of the project);
4. **permanent,** where time will not mitigate the visual impact.

**Intensity:** the magnitude of the impact on views, scenic or cultural resources.

1. **low,** where visual and scenic resources are not affected;
2. **medium,** where visual and scenic resources are affected to a limited extent;
3. **high,** where scenic and cultural resources are significantly affected.

**Probability:** the degree of possibility of the visual impact occurring:

1. **improbable,** where the possibility of the impact occurring is very low;
2. **probable,** where there is a distinct possibility that the impact will occur;
3. **highly probable,** where it is most likely that the impact will occur; or
4. **definite,** where the impact will occur regardless of any prevention measures.

**Significance:** The significance of impacts can be determined through a synthesis of the aspects produced in terms of their nature, extent, duration, intensity and probability, and be described as:

1. **low,** where it will not have an influence on the decision;
2. **medium,** where it should have an influence on the decision unless it is mitigated; or
3. **high,** where it would influence the decision regardless of any possible mitigation.

<sup>14</sup> We have added the term "district" as it better describes the range of most visual impacts.

**SUMMARY ASSESSMENT—NATURE OF IMPACT:** The development's visual impact has site-related to local extent, long term duration, medium intensity, definite probability, and medium significance on the landscape.

#### 5.4.8 Plomp Methodology

Visual impact assessment using the Plomp (2004) methodology (see Appendix for key):

Activity	Impact	Phase	Probability		Duration		Scale		Magnitude / Severity		Significance <sup>15</sup>		
			Score	Magnitude	Score	Magnitude	Score	Magnitude	Score	Magnitude	Score	WOM	WM
Visual Significance Score Calculation = Probability x (Duration + Scale + Magnitude) = 5 x (4 + 1.5 + 6) = 5 x 11.5 = 57.5													
Construction activities, operational infrastructure and lighting, decommissioning of infrastructure	Visual impact of development on surrounding landscape	Construction, operations and closure	5	Definite	4	Long Term	1.5	Local	6	Medium	57.5	Moderate	Low

#### 5.4.9 Distribution of Impacts

"Beneficiaries and losers"<sup>16</sup> (PGWC, p 21) of the project's visual impacts are mainly local as the development will only have high visual impact to the local environment.

#### 5.4.10 Photomontages

Photomontages were not prepared as they are not necessary in a Level 3 VIA.

### 5.5 Analysis of Alternatives

An analysis of alternatives was by others but not in the visual assessment. Only one site is under consideration here.

### 5.6 Planning Phase Impacts

This is potentially the most significant phase of a Project as it is here that crucial planning and design decisions are taken. **Critical Mitigation Recommendations are noted in bold.**

#### 5.6.1 Planning and Design

While there is a conflict between the need to densify urban areas within the urban edge at the same time as maintaining rural character along the urban edge, there is a similar conflict in

<sup>15</sup> Significance: Score calculation = Probability x (Duration + Scale + Magnitude); WOM Without Mitigation; WM With Mitigation.

<sup>16</sup> Possible better designations are "winners and losers" or "beneficiaries and adversaries" as, so often objectors become opponents in environmental and visual impact.

rural areas in the need to locate industrial type activities that are often unsightly. This has to be managed and mitigated.

As the WC Provincial Urban Edge Guideline has referred to the need **“to manage urban development in such a way that no development would detract from the visual quality of the environment and that all development conform to a characteristic style and urban form that suits the character of the area,”** further stating that **“this implies that edge development should not only be limited to certain areas through inclusion or exclusion, but that edge development should also be subject to urban design guidelines, architectural consideration and general aesthetic treatment”** for both natural and built environment (see section 3.5.1).

Furthermore, the WC Provincial SDF noted *inter alia* the following (see section 3.5.2):

- It also proposes **“to ensure effective management of all municipal functions and facets to ensure equitable and affordable services and amenities and a safe and aesthetically pleasing urban environment...”**.
- **Cultural resources acknowledged and protected as the fundamental link with the historical past and a basis for planning and shaping of future urban and rural environments.**
- **A safe, healthy and aesthetically pleasing urban environment, with the architectural and spatial character depicting the historical and cultural background of the habitat community.**

**Many of these components such as the mountains, farms and historical structures are irreplaceable national assets and accentuate the region’s unique character.** For this reason, policy guidelines and actions must be formulated to emphasize, protect and promote these components. **The character, the detail of the towns and any planned changes should thus be carefully considered.”**

As in any development, it is the character and layout determined by the visual-aesthetic-landscape analysis that will achieve the balance as best as possible.

#### **Mitigation Recommendation: Planning and Design**

The plans presented to date is an initial concept only. Therefore it is well able to take on any mitigation recommendations.

1. **Site Development Plan:** As noted previously, the concept plan is well conceived and sensitively fit to the landscape already:

- 1.1 **Taller structures such as the central facilities should be set back from the road as they are currently indicated and should not be moved to the edges of the site or nearer the R304.**

- 1.2 The landscape buffer along the edges is important to retain and should be well planted to prevent views into the site except at strategic locations such as on-axis.
- 1.3 The HIA refers to the old *trekpath* to Klapmuts and the possibility of finding any historical aerial or other photographs that could be used to inform and retain any traces of the old outspan.
- 1.4 Sustainable site development and Green Building principles or standards should be employed to enhance the environmental aesthetic.
- 1.5 Lighting must be carefully managed to minimise excessive lighting wherever possible (see Operation Phase below).
2. **Colouration:** Careful colouration of fences in particular needs to be made, as well as any other landscape furniture such as lighting, benches, water features. These should preferably be in a natural colour palette that will not stand out from the agricultural landscape nor draw attention to itself with bright colouration. Likewise, building colours, walls and roofs, should be subtle.
3. **Landscape Plan:** The Landscape Plan should retain its existing features overall and not be changed to something completely different such as a freeform design. The traditional arrangement of cemeteries, the avenues and bounding walls will fit well into both the historical and cultural landscape.
  - 3.1 Wherever possible the greening/planting of the scheme needs to be maximised.
  - 3.2 Permeable paving and other sustainable practices should be incorporated into the landscape plan.
  - 3.3 Planting using indigenous and preferably endemic species from the area should be planned from the beginning; traditional exotic trees are acceptable.
  - 3.4 Large trees should be incorporated into the Landscape Plan to screen tall buildings or unsightly areas such as the nursery/maintenance yard.
  - 3.5 Gum trees, pines and oaks, while not indigenous, are typically the only major trees that can survive the rugged environment and achieve the necessary scale. They are also traditional cultural elements and not out of place as a result.
  - 3.6 Indigenous/endemic trees can also be used but are not as tall as gums.
4. **Perimeter Treatment:** As described above this may incorporate screening trees or fences. The treatment of perimeter fencing and any signage needs to be carefully considered.



- 4.1 Unsightly massive walls are not appropriate but the traditional low Cape farm werf wall may suffice well on the boundary and help locate the site on the R304.
- 4.2 Should fencing be required use clear-view fencing or similar is preferred, not palisade. It should be coloured a dull green to match the local environment and not black, silver, brown or other unnatural, standard commercial colours.
5. **Biodiversity:** As noted above, where possible, endemic planting schemes should be used with the exception of traditionally planted trees, which are permissible for practical and cultural landscape reasons.
6. **Maintenance:** Scheme maintenance both of buildings and landscape need to be undertaken with commercial maintenance projects with this intention from the outset for the duration of the project. Good site tidiness should be maintained at all times.
7. **Visual Assessor Review:** The proposed Landscape Plan should be referred to the visual impact assessor, namely, New World Associates, for review before it is approved, to ensure that it meets the recommendations of this report.

## 5.7 Construction Phase Impacts

Construction Phase visual impacts are no more than normal for an urban site although they will be extensive.

### 5.7.1 Construction

Construction inevitably gives rise to noise, disruption and dust, amongst others. These are well covered by Municipal Bylaws. Site destruction and damage is also coincident with quarrying especially to water, soil and vegetation. Changes to the water table by excavations can also have a heavy impact on the trees with deaths occurring a few years later.

#### Mitigation Recommendation: Construction

1. **Damage Control:** All parties must make every effort to control the destruction of soils and vegetation on site, especially any remnants of natural vegetation. These must not be damaged under any circumstances.
2. **Pollution:** Chemical damage by cement mixing directly on the ground and by diesel, etc spills must also be prevented at all costs, as should vandalism of the plants and accidental damage to limbs by workers and machinery. Fires must be prevented also at all costs in all areas. Penalties and incentives should be implemented as can fencing off areas.
3. **Monitoring:** Monitoring of the landscape, soils and vegetation during construction is very important and must be attended to regularly. Damage to some is all too inevitable and often irreversible. Adequate indigenous (preferably endemic) vegetation must be planted.

## 5.8 Operation Phase Impacts

Lighting, landscape maintenance and conservation management are discussed.

### 5.8.1 Lighting

The Architectural and Landscape Guidelines need to consider lighting in their specific guidelines. Security lighting, while necessary, can be handled with care.

#### Mitigation Recommendation: Lighting

1. **Lighting:** Lighting should be minimised and carefully controlled as part of the project's management plan. The use of green energy fittings and concepts should be encouraged and lighting developed with sensitivity to the rural landscape.

### 5.8.1 Conservation Management and Landscape Maintenance

Waterwise landscaping should be used wherever possible and green star building practices.

#### Mitigation Recommendation: Conservation Management and Landscape Maintenance

1. **Landscape Maintenance:** must be carried out at all times in line with these recommendations to help keep the scheme green and encouraging local biodiversity.

## 5.9 Decommissioning Phase Impacts

On-going landscape maintenance and conservation management remains necessary.

### 5.9.1 Refurbishment and Resale

This is a continuing aspect of the property ownership cycle.

#### Mitigation Recommendation: Refurbishment and Resale

1. **Refurbishment and Resale:** The previous recommendations regarding Planning, Construction and Operation all apply to this process. The entire site can be dismantled and rehabilitated if no longer needed and restored to an appropriate land use.

This concludes the analysis of impacts and detailed recommendations for their mitigation. The chapter, Visual Management and Monitoring Plan follows. It gives recommendations for the management and monitoring of the environment and the given VIA recommendations.

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## 6 Visual Management and Monitoring Plan

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Sound Visual Management is the ultimate aim of the VIA process. The Mitigation Recommendations developed in the report need to be implemented. This process of implementation will occur throughout the lifetime of the project, hence, the need for a Monitoring Plan. Institutions, individuals and organisations referred in the Monitoring Plan must develop a means of achieving the monitoring otherwise this report serves no purpose. Once the VIA Report has been approved, the Developers must seek the implementation of the recommendations as soon as possible.

### 6.1 Introduction

This chapter uses the information developed in the previous section. It sets out a basic plan for the implementation of both site management and the VIA recommendations.

#### 6.1.1 Background

Site management in this case refers to that aspect of project management needed to control visual impact. The tools for visual management developed in the VIA Report are the *Mitigation Recommendations*. Their implementation also needs to be managed as part of the on-going site and impact management. A particular aspect of site management is monitoring. Monitoring is the routine inspection, recording and reporting of visual issues pertaining to visual impact aimed at mitigating impact by timely correction of problems as they arise.

#### 6.1.2 Key Issues

1. Monitoring is typically routine inspection with physical analysis and recommendation, or routine reporting by various combinations of parties as outlined. The on-going monitoring of various aspects of the project are critical to its success. Long term management of visual issues is a more challenging issue that comes down to what individuals do over time as allowed to by their local authority.

2. With the identification of monitoring method, analysis and reporting, is the identification of the responsible party as indicated in Figure 5: Visual Monitoring Plan. This figure is crucial in the successful implementation of the Mitigation Recommendations and consequently, a visually-friendly (or visually responsible) project. The key parties referred to in the Monitoring Plan are largely the Developers/Owners, the Designers, and the Planning Authorities.
3. **Once the VIA Report has been approved, the Developer must seek the implementation of the recommendations as soon as possible. The Developer and Designers need to take this document and embody it in their day-to-day operations and long-term plans. Mitigation Recommendations are all written specifically around the subject of project and site management for impact mitigation; it is their incorporation into overall project management policy and practice that is required.**

## 6.2 Visual Management

### 6.2.1 Project and Site Management

The management of the project and site with particular reference to visual concerns is the subject of the Mitigation Recommendations and, indeed, the whole VIA study. As the Mitigation Recommendations are all written specifically around the subject of project and site management for impact mitigation; it is their incorporation into overall project management policy and practice that is required. The information contained in the VIA Report effectively provides the necessary information for the project management to implement their project in a visually responsible manner.

### 6.2.2 Implementing the VIA Recommendations

The Mitigation Recommendations have been written as broad guidelines to identify principles for minimising visual impact. The recommendations are by no means specifications. **There is a tendency in the construction industry to damage and repair later, which, while possible in construction, is not always possible in the environment. A need for care towards the environment should be developed by the Contractors.** The Development Team needs to take this document and embody it in their planning and design, day-to-day operations and long-term plans.

## 6.3 Environmental Monitoring

### 6.3.1 Monitoring Methodology

The framework for administering the implementation of mitigation guidelines is presented in the monitoring plan on the following page (see Figure 5: Visual Monitoring Plan). The table comprises the list of project activities numbered in the same sequence as those in the Mitigation

Plan. For each project activity, recommendations are made from the following standardised monitoring activities:

### 6.3.2 Monitoring

The following types and timing of monitoring are suggested:

1. **Inspection:** site inspection (random, at completion), routine inspection (possibly annually), clean-up inspection (after completion of clean up of the accident incident).
2. **Monitoring:** observation (and photography).
3. **Review:** review of reports, plans and design.

### 6.3.3 Monitoring Plan

The Monitoring Plan has been tabulated for easy reference in the figure below.

Item	Project Component and Activity	Monitoring	Investigation	Reporting	Responsible Party
5.6	<b>PLANNING PHASE</b>				
5.6.0	VIA Report	Review	Physical and Recommendation	Recommendation	Planning Authorities
5.6.1	Planning and Design	Review	Physical and Recommendation	Recommendation	Authorities, Developers and Designers
5.7	<b>CONSTRUCTION PHASE</b>				
5.7.1	Construction	Site and Routine Inspection	Physical and Recommendation	Recommendation	ALL
5.8	<b>OPERATION PHASE</b>				
5.8.1	Lighting	Routine Inspection	Physical and Recommendation	Routine, <i>Ad hoc</i> Meeting	Owners, Authorities
5.8.2	Conservation Management and Landscape Maintenance	Routine Inspection	Physical and Recommendation	Routine, <i>Ad hoc</i> Meeting	Owners, Authorities
5.9	<b>DECOMMISSIONING</b>				
5.9.1	Refurbishment	Site Inspection	Physical and Recommendation	Routine, <i>Ad hoc</i>	Owner, Authorities

Figure 5: Visual Monitoring Plan.

### 6.3.4 Analysis

The following types of analyses are recommended:

1. **Physical:** on site and by photography.
2. **Recommendation:** check against VIA recommendation.

### 6.3.5 Reporting

The following methods of recording and reporting are recommended:

1. **Recommendation:** report or design recommendation.
2. **Routine:** log (daily, monthly, activity), report (quarterly), certificate, minutes.
3. **Ad hoc:** report (incident, closing).
4. **Meetings:** routine meeting (weekly), follow-up (incident), pro-active meeting (*ad hoc*).

### 6.3.6 Responsible Party

The following principal responsible parties have been identified as key during the monitoring process:

1. The Planning Authorities
2. The Developers and Owners
3. The Designers: Architects and Landscape Architects
4. The Contractors.

The above monitoring plan identifies who is conducting the prescribed monitoring activities. In cases where certification for compliance or approval are indicated the responsible certifi-

fyng or approving authority is noted. Many building activities are strictly controlled by local by-laws.

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# Appendices

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## Appendix A – Plomp Assessment Methodology (2004)

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## Appendix A: Plomp Assessment Methodology

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need.

The significance of the aspects/impacts of the process was rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process.<sup>17</sup> These matrices use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significances of the impacts were determined through a synthesis of the criteria below:

<b>Probability</b>	<b>This describes the likelihood of the impact actually occurring.</b>
Improbable	The possibility of the impact occurring is very low, due to the circumstances, design or experience.
Probable	There is a probability that the impact will occur to the extent that provision must be made therefore.
Highly Probable	It is most likely that the impact will occur at some stage of the development.
Definite	The impact will take place regardless of any prevention plans, and there can only be relied on mitigatory actions or contingency plans to contain the effect.
<b>Duration</b>	<b>The lifetime of the impact.</b>
Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
Medium term	The impact will last up to the end of the phases, where after it will be negated.
Long term	The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
Permanent	Impact that will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.
<b>Scale</b>	<b>The physical and spatial size of the impact.</b>
Local	The impacted area extends only as far as the activity, e.g. footprint.
Site	The impact could affect the whole, or a measurable portion of the above-mentioned properties.
Regional	The impact could affect the area including the neighbouring residential areas.
<b>Magnitude/ Severity</b>	<b>Does the impact destroy the environment, or alter its function.</b>
Low	The impact alters the affected environment in such a way that natural processes are not affected.
Medium	The affected environment is altered, but functions and processes continue in a modified way.
High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
<b>Significance</b>	<b>This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.</b>
Negligible	The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.
Low	The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.
Moderate	The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
High	The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

<sup>17</sup> Plomp, H. (2004). *A Process for Assessing and Evaluating Environmental Management Risk and Significance in a Gold Mining Company*. Conference Papers – Annual National Conference of the International Association for Impact Assessment: South African Affiliate.

Figure A-6: Impact Significance Criteria.

The following weights were assigned to each attribute:

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	<20
	Low	<40
	Moderate	<60
	High	>60

Figure A-7: Attribute Weighting.

The significance of each activity is rated without mitigation measures and with mitigation measures for both construction and operational phases of the development.

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**ANNEXURE Y**

**APPLICATION FOR REZONING FROM AGRICULTURAL  
ZONE 1 TO OPEN SPACE ZONE II FOR THE  
ESTABLISHMENT OF A PUBLIC CEMETERY AND  
MEMORIAL PARK: REMAINDER FARM NO. 29,  
STELLENBOSCH DIVISION**

**LETTER TO DEPARTMENT OF WATER AFFAIRS AND  
FORESTRY**

constitute a water use in terms of Section 21(e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1) of the National Water Act 1998, (Act 36 of 1998). Underway. This does form part of the application.

- A pre- Water Use Authorisation Application meeting must be arranged with this Department to determine what type of authorisation is required before any commencement of the activity. We have had 3 meetings already.

2. Please note the above activity should not be:

- Located below the 1:100 year floodline of a river or in close proximity of the water bodies such as wetlands, lakes, pans, estuaries and floodplains. Already discussed in detail with DWS who have confirmed that we can go ahead with a GA.
- Situated on unstable areas, like fault zones, seismic zones, dolomitic or karst areas where sinkholes and subsidence are likely. No problem here.
- Situated in or near sensitive ecological areas. Already discussed with DWS.
- Situated in or on areas characterized by flat gradients, shallow or emergent groundwater. Already discussed with DWS.
- Situated in areas characterized by steep gradients, or shallow bedrock with little soil cover, where stability of slopes could be a problem. Not applicable.
- Situated on areas of groundwater recharge on account of topography and/or highly permeable soils; Discussed in detail with DWS.
- Situated on areas overlaying or adjacent to important or potential important aquifers where such aquifers are to be used for water supply purposes. Discussed in detail with DWS.
- The cemetery should be situated more than 200m from the surface water resources and more than 300m from boreholes and wells used for human consumption without authorisation from this Department. Discussed in detail with DWS.

Department reserves the right to revise its initial comments and request additional information that may arise from correspondence and/or upon inspection.

Should you have any queries, please do not hesitate to contact Nkosinathi Mkonto at the contact details provided above. Nkosinathi has been in at least the two most recent meetings where it was confirmed that a GA is applicable. Anelia was also there for the last meeting and can attest to this conclusion.

**Can you please confirm that these comments have been addressed and please any proof of submissions of the above mentioned.**

**Please find attached the letter from DWS. All of the above points have been addressed with DWS in detail. An application has been lodged and a risk assessment submitted. The proof of submission letter hasn't been issued yet, but I will forward it as soon as it arrives.**

Kind regards,  
Christopher van der Walt



## water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

**WESTERN CAPE REGION**  
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✉ Mr. Nkosinathi Mkonto  
📁 16/2/7/G200/A/8  
✉ [mkonton@dws.gov.za](mailto:mkonton@dws.gov.za)

**Attention:** Jolandie Linnemann

CK Rumboll & Partners  
PO Box 211  
MALMESBURY  
7299

Dear Madam

### **APPLICATION FOR REZONING: FARM CALCUTTA NO 29, STELLENBOSCH DIVISION.**

The Department acknowledges receipt of your report dated 12 September 2019.

The Department has evaluated the application for the above mentioned activity and has the following comments:

1. The Department has noted that there is a non-perennial river and associated water courses traversing the proposed Calcutta cemetery. Please be advised that non-perennial rivers are regarded as watercourses (National Water Act, Act 36 of 1998). Please note activities occurring within these zones will constitute a water use in terms of section 21(c) impeding or diverting the flow of water in a watercourse and 21(i) altering the bed, banks, course or characteristics of a watercourse. A water use authorisation must be applied for and obtain prior to construction taking place. Risk matrix must be undertaken to determine the level of authorisation required.
- The report mentions the use of boreholes, that activity will constitute a water use in terms of Section 21(a) of the National Water Act 1998, (Act 36 of 1998)
- The report also mentions the use of treated effluent for irrigational purposes, this activity also will constitute a water use in terms of Section 21(e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1) of the National Water Act 1998, (Act 36 of 1998)
- A pre- Water Use Authorisation Application meeting must be arranged with this Department to determine what type of authorisation is required before any commencement of the activity..





## water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA

2. Please note the above activity should not be:

- Located below the 1:100 year floodline of a river or in close proximity of the water bodies such as wetlands, lakes, pans, estuaries and floodplains
- Situated on unstable areas, like fault zones, seismic zones, dolomitic or karst areas where sinkholes and subsidence are likely.
- Situated in or near sensitive ecological areas.
- Situated in or on areas characterized by flat gradients, shallow or emergent groundwater.
- Situated in areas characterized by steep gradients, or shallow bedrock with little soil cover, where stability of slopes could be a problem
- Situated on areas of groundwater recharge on account of topography and/or highly permeable soils;
- Situated on areas overlaying or adjacent to important or potential important aquifers where such aquifers are to be used for water supply purposes.
- The cemetery should be situated more than 200m from the surface water resources and more than 300m from boreholes and wells used for human consumption without authorisation from this Department

Department reserves the right to revise its initial comments and request additional information that may arise from correspondence and/or upon inspection.

Should you have any queries, please do not hesitate to contact Nkosinathi Mkonto at the contact details provided above.

Yours faithfully

**REGIONAL HEAD: WESTERN CAPE**

Signed by: Nelisa Ndobeni

Designation: Control Environmental Officer

Date: 25 OCTOBER 2019

