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DRAKENSTEIN MUNICIPALITY CEMETERY STUDY

**Compiled for:
DRAKENSTEIN MUNICIPALITY**



**Prepared by:
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CHAPTER 1 : INTRODUCTION

1.1 BACKGROUND

In order for the Drakenstein Municipality to effectively and efficiently take care of its local government function regarding the provision and management of cemeteries, it recognised the need to:

- (i) Take stock of current cemetery provision and requirements within its area of jurisdiction;
- (ii) Take cognizance of recent trends within the municipality (such as HIV/Aids rate) impacting on its ability to provide an effective service in respect of cemeteries;
- (iii) Take cognizance of current growth patterns within the municipality in relation to existing cemetery provision;
- (iv) Be pro-active in the identification and provision of new cemetery sites;
- (v) Optimize the utilization of existing and new cemeteries in the light of:
 - The spatial extent of cemeteries and their impact on the form and growth of the town;
 - The burial requirements of different cultural/religious groups
- (vi) Develop a uniform cemetery policy that will consolidate and streamline the policies of the old municipal areas within the Drakenstein Municipal area.

Subsequently, the Municipality called for a Cemetery Study to address current and future cemetery management, design and planning, setting the following objectives for such assessment:

- (i) To assess the current cemetery provision within the municipal area.
- (ii) To assess current cemetery performance in the light of the various policies currently in force.
- (iii) To assess future requirements in respect of cemetery provision within the municipal area.
- (iv) To investigate the legislative and policy requirements of cemetery provision.
- (v) To identify the key issues in respect of cemetery provision to be addressed by the municipality.
- (vi) To provide a strategic framework for cemetery provision that will ensure long-term burial capacity (but also providing strategic direction for the short, medium and long term), including a uniform policy for the municipal area.
- (vii) To identify new and alternative cemetery sites, both on a local and regional level with specific emphasis on areas with short term needs.
- (viii) To develop management guidelines for the effective and efficient operation of cemetery facilities throughout the municipality (including grave recycling, grave design, local vs regional cemeteries, etc.).

1.2 STUDY BRIEF

The Setplan-DJ Environmental Consultants Joint Venture was appointed to undertake the Drakenstein Municipality Cemetery Study in accordance with Contract No PH 1/2005 Cemetery Study dated 27 June 2005.

1.3 STUDY AREA

Figure 1 illustrates the study area, namely the Drakenstein municipal area. Also illustrated are the locations of the existing cemeteries as well as proposed new cemetery sites.

1.4 TASK APPROACH AND METHODOLOGY

Recognising local needs as well as the complex and broad range of cemetery informants, the task approach was underpinned by the following objectives:

- (i) Need to be strategic and address the issues and tasks at hand.
- (ii) Need to clearly distinguish between cemetery assessment/strategy and actual cemetery development, with consensus of all parties regarding the former (i.e. strategy) being a pre-requisite for the latter (i.e. implementation).
- (iii) Need for a co-ordinated strategy, integrating cemetery location/development within other municipal sectors (e.g. spatial structuring, community development, IDP, etc.).
- (iv) Need to conduct an integrated assessment in order to ensure environmental sustainability, and technical and financial feasibility.
- (v) Engaging cemetery management staff in order to facilitate appropriate information sourcing and transfer.

The methodology employed is illustrated in Diagram 1 including the following distinct tasks:

- (i) **A cemetery performance assessment**, with such assessment being informed by technical requirements, death industry informants, existing cemetery conditions and cemetery capacity requirements.
- (ii) Determining the scope of **strategic intervention** required, through identifying the current cemetery issues and their implications.
- (iii) Formulating a **strategic provision framework** detailing cemetery provision requirements (short and long term) and management guideline informants.

Diagram 1 also illustrates the need for a subsequent **implementation phase** comprising of detail implementation actions and management guidelines per cemetery.

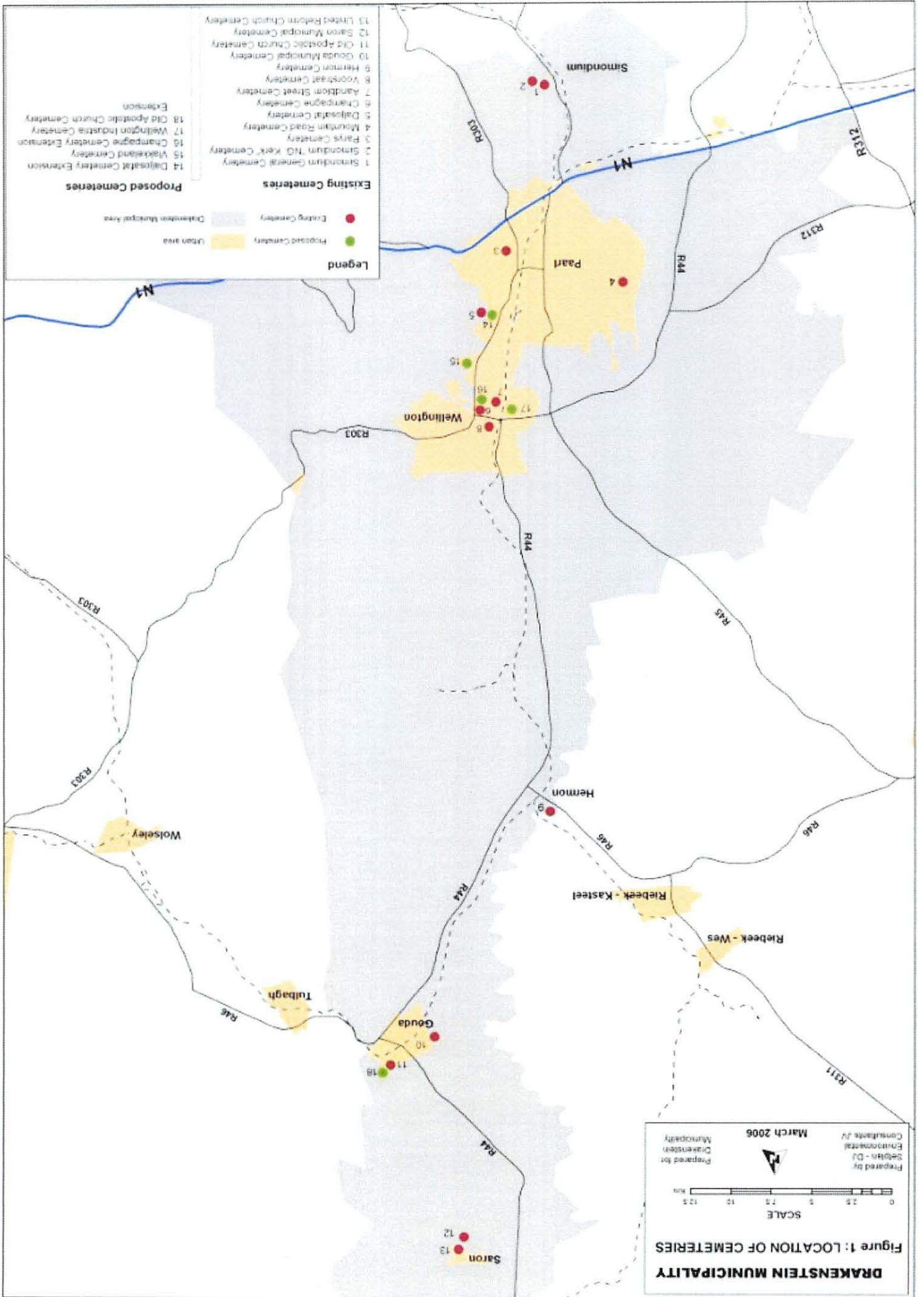
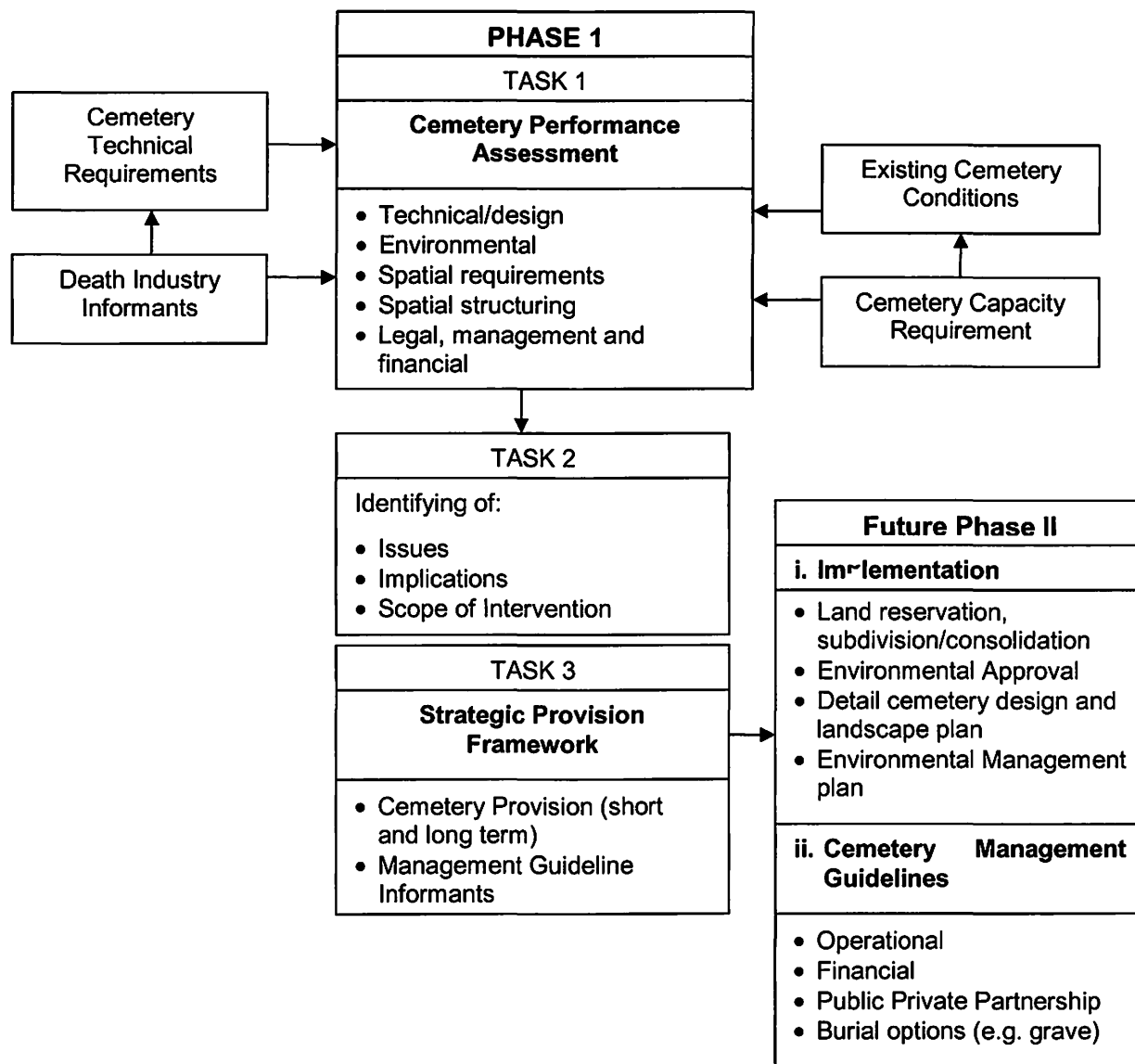


DIAGRAM 1 : STUDY METHODOLOGY



1.5 INSTITUTIONAL ARRANGEMENTS

A Technical Steering Committee comprising officials of the Drakenstein Municipality (Planning and Economic Development, Parks and Environment, Community Services and Engineering Services) and the Consultant Team provided for co-ordination and supervision of the study, with the Committee meeting on five occasions during the term of the study.

1.6 STUDY LIMITATIONS

These included:

- (i) The study not including any public participation.
- (ii) Consultation being restricted to municipal and departmental officials, and if required, cultural groups (e.g. Muslim).

- (iii) Geotechnical surveys being limited to a total of twenty holes, representing a reconnaissance, rather than a detail survey.
- (iv) The study being restricted to a strategic framework and not detail implementation and management guidelines.
- (v) Burial data being restricted to that captured by the Drakenstein Municipality or former municipalities.

1.7 REPORT STRUCTURE

The balance of this report is structured as follows:

- (i) The **main report** comprises the following:
 - Chapter 2 : Current Cemetery Performance
 - Chapter 3 : Key Issues, Objectives and Interventions
 - Chapter 4 : Strategic Provision Framework
 - Chapter 5 : Management Guideline Informants

Concluding remarks are contained in Chapter 6.

- (ii) A **technical annexure** to the main report contains the following technical assessments:

Section 1 :	Demographic Characteristics
Section 2 :	Current Grave Demand per Cemetery
Section 3 :	Existing Cemetery Performance
Section 4 :	Burial Tariff Analysis
Section 5 :	Parys Cemetery : Potential Grave Infill
Section 6 :	New Cemetery Site Investigation (Metropolitan)
Section 7 :	New Cemetery Site Investigation (Rural Towns)
Section 8 :	Existing Cemeteries; Management, Maintenance and Infrastructure Development Requirements
Section 9 :	New Cemeteries; Management, Design and New Infrastructure Requirements
Section 10 :	Legislation

CHAPTER 2 : CURRENT CEMETRY PERFORMANCE

This chapter defines the current cemetery function within the Drakenstein municipal area in terms of its extent, current capacity, future demand and capacity to meet the demand, as well as opportunities and constraints confronting the cemetery function.

2.1 CEMETERY FUNCTION AND CAPACITY

In order to define the existing cemetery function in terms of extent of cemetery development and current capacity, an in-field assessment of each cemetery, together with an analysis of burial records (1999 – 2005) was undertaken (refer Technical Annexure : Section 2 and Section 5).

Table 1 illustrates extent and capacity of cemeteries within the municipal area, including both municipal and private cemeteries.

TABLE 1 : EXTENT AND CAPACITY OF EXISTING CEMETERIES (2005)

CEMETERY	AVERAGE ANNUAL BURIALS/YEAR	ANNUAL SPATIAL REQUIREMENT/ YEAR (M ²)	CURRENT VACANT BURIAL AREA	CURRENT GRAVE CAPACITY
Parys	642	3210 m ²	22125 m ²	4425
Dal Josafat	223	1117 m ²	Nil	Nil
Champagne	340	1700 m ²	2000 m ²	400
Voorstraat	10 (Muslim)	50 m ²	50 m ²	10
Aandblom	Nil	Nil	Nil	Nil
Mountain Drive	Nil (Muslim)	Nil	Nil	Nil
Simondium General	72	360 m ²	2200 m ²	440
Simondium (NG)	0,4	2 m ²	2500 m ²	500
Hermon	13	67 m ²	14800 m ²	2960
Gouda (Municipal)	1	5 m ²	1700 m ²	340
Gouda (Apostolic)	45	223 m ²	1600 m ²	320
Saron (Municipal)	15	95 m ²	30000 m ²	6000
Saron (U.R.C.)	23	243 m ²	3000 m ²	600
TOTAL	1384	7072 m² or 0,7ha	79975 m² or 7,9975ha	15995

2.1.1 Extent of the Cemetery Function

The extent of the cemetery function within the municipal area can be summarized as follows(refer Table 1 and Figure 1):

- (i) The municipality currently manages:
 - 7 operational cemeteries, namely Parys (Paarl), Dal Josafat (restricted to child burials), Champagne (Wellington) Simondium (general and NG), Hermon, Gouda (municipal) and Saron (municipal)
 - 3 partially operating or full cemeteries, including Voorstraat (Wellington - full with limited Muslim burials taking place), Aandblom (full) and Mountain Road (full – Muslim)

- (ii) Municipal cemetery utilization varies significantly, with Parys accommodating 642 burials/year, Dal Josafat; previously 223 burials/year until capacity was reached in 2004, and Champagne; 340 burials/year. Rural town municipal cemeteries experience significantly lower burials per year, with Simondium (general) accommodating the most burials (72/year), followed by Saron (15/year) and Hermon (13/year). Municipal cemeteries that can be regarded as either full or dormant include Voorstraat, Aandblom, Mountain Drive, Simondium (NG), Gouda (municipal) and Dal Josafat.
- (iii) Private cemeteries of significance include the "United Reform Church" cemetery at Saron and the "Old Apostolic Church" cemetery at Gouda, with these two cemeteries annually accommodating 23 and 45 burials respectively. The "Old Apostolic Church" cemetery in Gouda is currently being taken over by the Drakenstein Municipality.
- (iv) Annually a total of 1384 burials occur in the municipal area (2000-2004 average), with municipal cemeteries accommodating 1316 burials as opposed to 68 in private cemeteries per annum (i.e. a 95% - 5% split). This split changes to 98%-2% with the placing of the Old Apostolic Church cemetery in Gouda under municipal management.
- (v) During the period 2000-2004 the cemetery function has witnessed the following annual growth per cemetery:
- Positive growth at Parys (7,8%), Champagne (2,54%) and Saron (UPC) (8,25%), with Saron (municipal) (33,9%) due to its establishment in 2000.
 - Simondium (NG) and Gouda (municipal) being static at 0%.
 - Negative growth at Simondium (general) (-14,2%), Hermon (-22%), Gouda (Old Apostolic) (-10,5%) and Dal Josafat (-8,75%), with the negative growth at Dal Josafat due to it reaching capacity in 2004/2005.

The decrease in burials in certain of the rural town cemeteries (e.g. Simondium, Hermon and Gouda) is attributable to several factors, including:

- A decreasing rural population or shift in age structure, with the elderly relocating to metropolitan/urban areas prior to death.
 - Cremation becoming a more popular interment option.
 - Shifts in religious (church) affiliation (e.g. increase in burials at the URC cemetery in Saron).
- (vi) Current burials have a spatial requirement of 0,7ha of nett grave space per annum, with 0,6077ha thereof being in the "metropolitan area" (i.e. Paarl/Wellington), as opposed to only 0,0995ha in the rural towns (e.g. Saron, Hermon).
- (vii) The majority of Muslim burials occur in the Muslim denominational sections of Parys and Voorstraat cemeteries (totalling an average of 24 burials/annum).

- (viii) Jewish burials (totalling some 5 burials annually) occur mainly in the Jewish denominational section of Parys cemetery, with limited burials at Champagne cemetery.
- (ix) While no statistics are available for either cremation or burials "outside" of the municipal area (i.e. including "village" burials in the Eastern Cape), a comparative analysis of total deaths (1806 in 2004) and total burials (1377 in 2004) reveals the following:
 - Some 427 internments (i.e. cremation and burials) occurred outside the municipal area, that is 23,6% of the total deaths.
 - Based on trends in newly established Black residential areas (e.g. Khayelitsha), some 20% of deaths are interned as "village" burials in the Eastern Cape. A similar trend in the Drakenstein municipal area could account for an estimated 40 such burials per annum or 2,2% of the total deaths (2004).
 - Cremation, included in the 23,6% of total deaths interned outside the municipal area, is therefore considerably lower than the national average for urban areas (i.e. up to 36-37%).
- (x) Farm cemeteries, catering for farm owners, their families and workers on the farms, are located randomly throughout the municipal area, especially on older and historic farms. Such cemeteries are not registered, with no burial records being publicly available.

2.1.2 Current Cemetery Capacity

In order to determine the current capacity (2005) of each of the cemeteries, an in-field assessment, together with cemetery staff, was undertaken. Thereby vacant, unutilized burial areas and potential grave capacity was determined. Furthermore, a comparative analysis of annual average grave demand per cemetery and per denominational section (e.g. Parys) informed the potential future demand for graves per cemetery or per denominational section.

The following additional assessments were undertaken to assess the impact of both private cemeteries and denominational sections on municipal cemetery capacity:

- (i) **Parys Cemetery**
Being a denominational cemetery, each of the 26 separate denominational areas were evaluated (refer Technical Annexure : Section 5)
- (ii) **Gouda Cemetery**
The Old Apostolic Church Cemetery (private) was assessed given that the majority of burials in Gouda take place in this cemetery as opposed to the Gouda municipal cemetery.
- (iii) **Saron**
Cognisance was taken of the United Reform Church Cemetery (private) given that double the number of burials occur in this cemetery as opposed to the Saron municipal cemetery.

Table 1 and Sections 2 and 5 of Technical Annexure reflect the current vacant burial area per cemetery and current grave capacity; with the following being noted:

- (i) Parys Cemetery: While experiencing a shortfall in the "general" section, a potential of 4425 graves exists given the opportunity for infill graves within the various denominational areas. Included in the 4425 grave potential is 1000 graves (Muslim area) and 1000 graves (partial utilization of the Hero's Acre). From the denomination area assessment (Technical Annexure : Section 5) it is apparent that several denominational areas have a grave potential of 100-500 graves, but only require 10-20 graves per annum (Technical Annexure : Section 2 : Table 2).
- (ii) Dal Josafat: Full, apart from child and family grave burials.
- (iii) Simondium: Partially full, with 0,22ha (440 graves) currently available in the "general" cemetery and 0,25ha (500 graves) available in the NG Cemetery.
- (iv) Champagne Cemetery (Wellington): Existing developed portion approaching capacity, with a 400 grave capacity (including the underutilized Jewish denominational area) prior to the implementation of the new undeveloped section.
- (v) Hermon: Significant vacant area, with capacity for 2960 graves, given 1,48ha available.
- (vi) Gouda:
 - Municipal Cemetery : Significant capacity given low burial. Capacity for 340 graves given 0,17ha being available
 - Old Apostolic Church : Partially full, with a 320 grave capacity given 0,16ha available
- (vii) Saron Municipal Cemetery: Significant capacity given extent of the municipal cemetery and extent of the United Reform Church cemetery. Capacity for 6000 graves at municipal cemetery given >3ha available and 0,3ha (600 graves) at the URC cemetery.
- (viii) The following cemeteries being regarded as full, namely:
 - Voorstraat (except for limited Muslim burials).
 - Aandblom (dormant)
 - Mountain Drive (dormant)

Currently, some 7,997ha of vacant burial area exists within municipal and private cemeteries within the Drakenstein municipal area, with a potential capacity of 15 995 graves.

2.1.3 Drakenstein Municipal Area Cemetery Demand (2006-2015)

The following informants were employed to determine grave demand in the Drakenstein municipal area for the 10 year period 2006-2015:

- (i) Population projection model (2006) for the Western Cape, including the Drakenstein municipal area. This model, developed by the Centre for Actuarial Research (CARE) for the Department of Social Services and Poverty Alleviation (PGWC) is based on 2001 population census data and specifically calibrated to fit the HIV/AIDS epidemic in the Western Cape, with the modelling including the effects of anti-retroviral treatment.
- (ii) 23,6% of total deaths being interned outside the municipal area (e.g. cremations, burials, village burials, etc.).
- (iii) Approximately 2% of total internments being buried in the Eastern Cape (i.e. village burials).
- (iv) Only 1,7% of burials within the municipal area occur in private cemeteries, that is subsequent to Drakenstein Municipality taking over the management of the Old Apostolic Church Cemetery in Gouda.

Technical Annexure : Section 1 details the following demographic characteristics informing grave demand and the programming of grave supply in the Drakenstein municipal area:

- 2001 population per enumeration district (2001 Census) (Section 1 : Table 1)
- Population growth, birth rate, death rate and total deaths (Section 1 : Table 2)
- Total population, total HIV infections, non-AIDS deaths and AIDS deaths (Section 1 : Table 3)

Informed by the actuarial projection model, Table 2 illustrates the projected deaths (non-AIDS and AIDS deaths) within the Drakenstein municipal area for the period 2001-20015.

TABLE 2 : PROJECTED DEATHS (DRAKENSTEIN MUNICIPAL AREA) 2001–2015

YEAR	NON-AIDS	AIDS	TOTAL DEATHS
2001	1471	188	1659
2002	1469	244	1713
2003	1485	283	1768
2004	1504	302	1806
2005	1523	327	1850
2006	1545	365	1910
2007	1562	404	1966
2008	1580	442	2022
2009	1597	479	2076
2010	1615	514	2129
2011	1637	546	2183
2012	1658	571	2229
2013	1680	592	2272
2014	1701	606	2307
2015	1722	616	2338
TOTAL	23749	6479	30228

Referencing the actuarial projection model, the following projected growth and death rates in the Drakenstein municipal area between 2006 and 2015 are forecast:

- (i) An increase in the death rate from 0,98% in 2006 to 1,23% in 2015, that is an increase of 25,5%
- (ii) A decrease in the birth rate from 1,97% in 2006 to 1,74% in 2015, that is a decrease of 11,6% due to the impact of AIDS.
- (iii) In 2001 AIDS deaths accounted for 12,7% of all deaths, while in 2006 AIDS death will account for 21,5% of all deaths, increasing to 35,8% in 2015.
- (iv) Drakenstein municipal area will witness an average annual increase of 2,24% in deaths between 2006 and 2015, with such annual increase having the following trend; 3,2% (2005-2006), 2,54% (2010-2011) and 1,34% (2014-2015).

Deaths in the municipal area during the period 2006 to 2015 are projected at 21432, with 16297 being non-Aids deaths and 5135 being AIDS deaths. Diagram 2 illustrates the projected deaths (2001-2015), while Diagram 3 illustrates level of AIDS infections in the municipal area during the period 2001-2005.

DIAGRAM 2 : PROJECTED DEATHS (2001 – 2015)

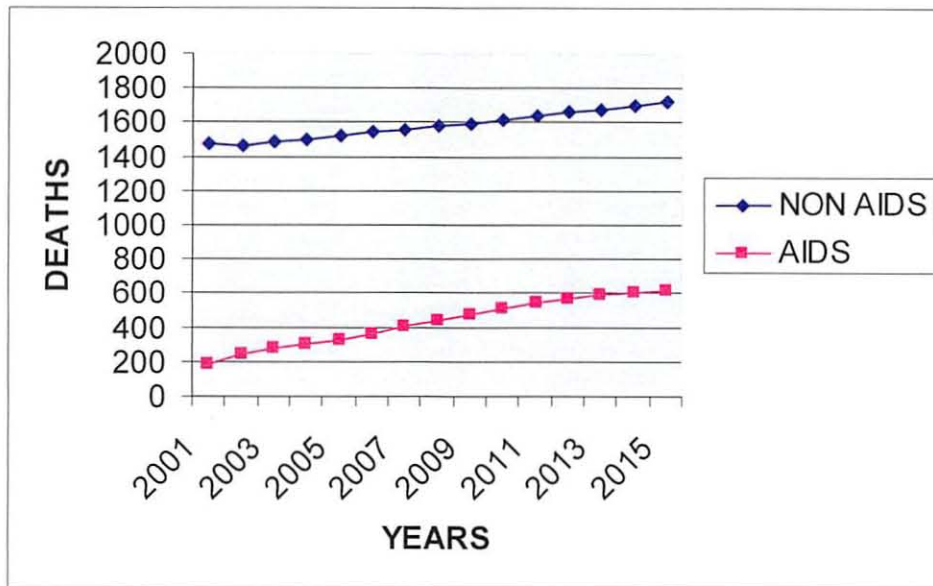
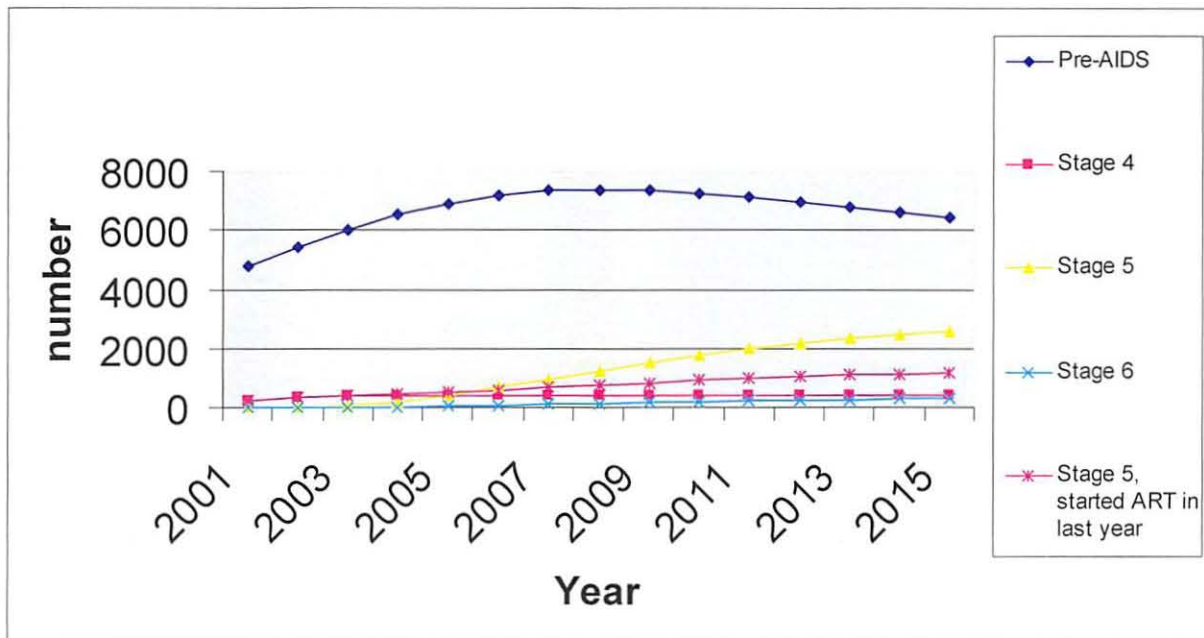


DIAGRAM 3 : AIDS (2001 – 2015)



Employing the current burial rate of 76,4% within the municipal area, 23,6% of internments outside the municipal area (i.e. cremation, village burials or burials elsewhere), a 2% / 98% split in private/public cemetery burials, and a grave density of 2000 graves/ha or 5m²/grave (1 burial/grave), the forecasted deaths for the period 2006 to 2015 translate into the following cemetery spatial requirements (refer Table 3).

TABLE 3 : TOTAL DRAKENSTEIN CEMETERY GRAVE AND SPATIAL REQUIREMENTS (2006 – 2015)

TOTAL DEATHS IN MUNICIPAL AREA	INTERMENTS (units) OUTSIDE MUNICIPAL AREA	PRIVATE CEMETERY BURIALS		MUNICIPAL CEMETERY BURIALS	
		No of Graves	Cemetery Area Requirements (ha)	No of Graves	Cemetery Area Requirements (ha)
21432	5058	327	0,1635ha	16047	8,0235ha

Within the Drakenstein municipal area up to 95% of the cemetery/grave requirement will be in the “metropolitan area” given the following:

- (i) Predominant Paarl-Wellington urban “metropolitan” area comprising >80% of the municipal area population.
- (ii) Significant individual urban concentrations (e.g. Mbekweni, Dal Josafat) within the “metropolitan” urban area, with such areas also accommodating the major share of population influx.
- (iii) Current urbanization trends, especially amongst the younger more mobile population.

2.1.4 Capacity to Address Drakenstein Municipal Area Burial Demand (2006 – 2015)

Reconciling existing cemetery capacity (up to 15 995 graves) and the 2006–2015 burial requirement of 16 374 graves reveals the following shortfalls and concerns:

- (i) Only 4835 vacant graves or 30% of the available graves are within the urban/metropolitan area, which requires 95% of the future grave supply. Conversely, 11160 vacant graves or 70% of the available graves are within the rural towns, which require only 5% of the future supply.
- (ii) Within the urban/metropolitan area, the bulk of available graves (i.e. 4425) are located in Parys Cemetery, with the following implications:
 - Available graves have been “allocated” to 26 different church denominations.
 - The location of Parys cemetery is not central to, or within convenient distance of several of the major urban concentrations (e.g. Mbekweni, Dal Josafat and Wellington).
- (iii) A grave shortfall is currently being experienced in the “general” section of Parys Cemetery, given that it is a favoured burial choice for the Dal Josafat and Mbekweni communities subsequent to Dal Josafat and Champagne cemeteries reaching capacity.

- (iv) Local denominational shortfalls, including:
 - Graves for the Wellington Muslim community (i.e. Voorstraat Cemetery)
 - Several church denominations at Parys Cemetery including: Bethel, Seven-Day Adventists, Roman Catholic, Emmanuel, "NG", etc.
- (v) While local rural area shortfalls will be experienced in certain cemeteries (e.g. Gouda Apostolic and Simondium general), total rural town demand can be met through a rationalization of the total available grave space (e.g. two cemeteries in both Gouda and Simondium).

2.3 CEMETERY OPPORTUNITIES AND SHORTCOMINGS

(refer Technical Annexure : Section 3 – Existing Cemetery Performance)

The current performance of each of the twelve cemeteries, including non-operational, dormant, municipal and private, was assessed in accordance with the following parameters:

- (i) Geohydrological
- (ii) Environmental
- (iii) Maintenance
- (iv) Existing facilities
- (v) Existing access, including parking
- (vi) Space utilization

Findings of this assessment are detailed per cemetery in Section 3: Existing Cemetery Performance contained in the Technical Annexure.

These findings, together with those of other assessments (e.g. management and financial) highlight the following opportunities and shortcomings of cemetery within the Drakenstein municipal area (refer Photo Sheet 1 for examples):

2.3.1 Technical Performance

- (i) Geohydrological Conditions

An historic poor siting of cemeteries in relation to specific geohydrological conditions results in the following in the majority of the cemeteries:

 - Water percolation into graves due to paleo gravel channels on clay (photo 1).
 - Perched water table due to clay layers.
 - Poor drainage in graves due to high clay content of soil (photo 2).
 - Restrictive rock and clay subsurface conditions (photo 3).

The implications of these geohydrological conditions are as follows:

- Grave leachate, arising from saturated (anaerobic) grave conditions poses a pollution hazard for both surface and ground water, cemetery workers and funeral-goers (e.g. Parys Cemetery).
- A high water table and saturated ground condition impacts negatively on cemetery operation. It restricts grave depth, delays grave

preparation, restricts full cemetery use, inconveniences burials and jeopardizes decomposition. Furthermore, the current practise of pumping grave water to ground, as opposed to sewer, and the addition of Jeyes Fluid to counteract the grave leachate, contribute directly to possible ground and surface water pollution.

- Rock, tight clay and shale impact negatively on grave preparation, in terms of excavatability (e.g. Gouda), soil workability (e.g. Saron) and grave preparation cost and programming due to mechanical requirements.

(ii) Stormwater Management

The absence or inadequate provision of stormwater management or poor maintenance of stormwater infrastructure (photo 4) both peripheral to and within the majority of cemeteries, results in the following:

- Damage to and erosion of cemetery roadways (photo 5).
- Flooding of recently dug graves in areas of poor drainage due to a high clay presence (photo 2), with pumping being required prior to burial.
- Ingress of water into existing graves resulting in subsidence and collapsing of grave mounds (photo 6) and monumental works (photo 7)

(iii) Facilities and Infrastructure

Within the municipal area a wide disparity in the level of cemetery facilities and infrastructure presents itself, with notable deficiencies including:

- Appropriate entrance façades, gateways and informative signage (photo 8 and 9).
- Adequate access roads and parking areas (photo 10).
- Toilet, shower and changing facilities for cemetery staff, and toilets and shaded seating for funeral-goers.
- Piped potable water.
- Adequate storage facilities for cemetery equipment.
- Absence or poor condition of perimeter enclosure and gates, resulting in adhoc access, poor visitor security and vandalism in certain cemeteries (e.g. Aandblom).

In several instances, sub-standard infrastructure (e.g. road construction, stormwater management) results in an increased maintenance liability.

2.3.2 Environmental Performance

While the majority of cemeteries are well maintained, their environmental performance is lacking, given the following:

- (i) Alien plant infestation, together with a limited employment of indigenous vegetation impacts negatively on biodiversity, maintenance and water usage.
- (ii) Poor environmental health conditions given waterlogged grave working conditions.
- (iii) Poor levels of maintenance in certain instances (photo 11) resulting in a poor visual quality and difficult grave access and identification.

- (iv) Adhoc dumping and littering in and around cemeteries (photo 12).
- (v) Unrestricted pedestrian movement and vandalism (photo 13) given limited perimeter enclosure.
- (vi) Increasing potential of ground and surface water pollution given high occurrence of saturated grave conditions.
- (vii) Poor visual quality and lack of identity given a lack of screening and entrance façade.
- (viii) Lack of user friendliness and an undignified burial experience given lack of facilities (e.g. toilets, shaded seating) and poor or no directional signage.

2.3.3 Cemetery Design and Type of Internment

Designs underpinning the cemeteries in the municipal area reflect historical and traditional design approaches, typifying a monumental as opposed to a functional approach, with the following implications:

- (i) Limited functional use of the cemetery and its facilities in terms of appropriate segmentation for programming, grave type, cultural and age differentiation or geotechnical conditions (e.g. shallow child graves).
- (ii) Where employed, denominational segregation (e.g. Parys) due to inadequate programming, monitoring and timeous re-allocation is resulting in grave shortfalls amidst a potential 4425 grave availability.
- (iii) Limited post-use-conversion of both the cemetery (e.g. parkscape or recreation environment) and its facilities (e.g. community usage of buildings).
- (iv) Not forming part of the urban form as a community or civic space, given a lack of visual focus and defined sense of place or arrival.
- (v) Not facilitating adequate traffic/funeral-goer movement, circulation, gathering and parking.

Similarly, the type of internment and grave is restricted (i.e. single in-ground burial), with the following implications:

- (i) Limited use of berm and park landscape burial, with associated strip mowing and indigenous cover planting to effect maintenance efficiency and reduced cost, as well as an opportunity for post-use conversion into a parkscape. Monumental grave adornments (photo 14) restrict maintenance to costly weed-cutter operation, while the practise of retaining grave mounds (photo 15) allows mound erosion and displacement to further complicate maintenance. Community and cultural integration is resulting in a mixture of these two grave types (photo 16), further complicating maintenance.

- (ii) Limited choice of other internment options to facilitate efficient cemetery space utilization (e.g. public or multiple burials per grave and grave recycling), promoting cremation (e.g. provision of niche boxes and commemorative walls) and utilizing areas of poor geotechnical/ environmental performance for above-ground burial (e.g. mausoleum).

2.3.4 Cemetery Siting and Urban Structuring

Due to historic siting, the existing cemeteries are a response to urban concentrations at the time, facilitating convenient access, proximity to associated churches, mission stations, etc. Such historic siting, amidst a significant expansion of the urban built form, results in the majority of cemeteries not serving an urban structuring role as formal civic spaces, or reinforcing the urban edge, complying with densification objectives or meeting open space utilization guidelines. In several instances, existing cemeteries are in conflict with such objectives and subject to urban pressures (e.g. Aandblom, Parys, Champagne, Dal Josafat and Simondium). Other cemeteries on the other hand (e.g. Hermon, Gouda), offer urban edge interface opportunities. Additionally, spatial planning initiatives afford little recognition to the potential urban structuring opportunity offered by cemeteries.

2.3.5 Regulatory Compliance

The Drakenstein Municipality has, in terms of Provincial Circular C/195 of 30 January 1995, the Municipal Systems Act 2000, (Act 32 of 2000) and the South African Constitution (Schedule 5; Part 5) a legal mandate to establish, take over and close cemeteries or portions thereof, as well as authorize exhumations. Furthermore, in terms of the Municipal By-law for Cemeteries (Drakenstein Municipality) regulations and procedures for the establishment and management of all aspects of cemeteries are prescribed.

Provincial and national legislation (refer Section 10 ; Technical Annexure) set additional requirements for the establishment and performance of cemeteries.

The study has identified the following areas of non-compliance:

- (i) Limited enforcement of requirements (e.g. Occupational Health and Safety Act) regarding the wearing of protective clothing by grave diggers, especially in water logged conditions. Additionally, limited facilities (e.g. showers and dedicated changing rooms) are available for cemetery workers.
- (ii) Limited public protection (e.g. demarcation of open graves) or warning signage (e.g. hazard tape).
- (iii) Limited cognisance of the Water Act, given the potential for ground and surface water pollution (e.g. monitoring of boreholes, restriction on pumping to ground) and the responsibility of the municipality in this regard.

- (iv) No clear directive for farm burials within the municipal area.
- (v) Possible infringements regarding the storage and management of bodies (i.e. village burials).
- (vi) No common cemetery and crematoria definition, establishment and use requirements, or the inclusion thereof in planning directives (e.g. zoning scheme).

2.3.6 Cultural Requirements

The cultural composition of the population served by the cemeteries in the Drakenstein municipal area requires careful consideration of the following burial rites, approaches and preferences:

- (i) A strong opposition to cremation and multiple burial by a broad spectrum of the population (Black, Muslim and Jewish communities).
- (ii) Varied operational requirements, including Saturday burials (Black community) burial urgency (Muslim community), prescribed grave digging and filling (Muslim community), specific grave dimensions and orientation (Muslim community), separate denominational requirements and extensive burial processions or extended burial programmes.
- (iii) Cemeteries being regarded by many as “places of memory”, that serve as cultural and historical landmarks (e.g. war graves, hero’s acre).
- (iv) The need to facilitate convenient and dignified cemetery visitation, given on-going and regular visitation by several faith groups to ensure the ever present link between the living and the dead.

The study highlighted the following cultural shortcomings:

- (i) A failure to embody the concept of a “sense of place or memory” in the majority of cemeteries, or establish them as cultural or historic public places.
- (ii) Majority of cemeteries are not conducive to regular visitation or extensive burial processions and extended burials given a lack of facilities.
- (iii) Pending shortfall in Muslim burial capacity in Wellington.
- (iv) Current shortage of burial capacity in convenient proximity to the major concentration of the Black population (e.g. Mbekweni) subsequent to capacity being reached at Dal Josafat cemetery.
- (v) Historic allocation of denominational areas in certain cemeteries (e.g. Parys, Champagne) no longer being compatible with current demand due to population shifts, faith affiliation trends and changes. This is resulting in vacant graves (up to 4425 in Parys) in certain denominational sections while shortfalls are being experienced in others (e.g. general section).

2.3.7 Management Performance

While it is recognised that the management of cemeteries has been subject to restructuring to facilitate the incorporation of previous municipalities into the Drakenstein Municipality, the following management shortcomings are identified:

- (i) **Cemetery and Burial Data Management** requires to be standardised given the following:
 - Adequate and fully functional electronic burial data capture (data and software) for Champagne, Parys, Simondium and Dal Josafat needs to incorporate burial data for the other cemeteries (e.g. Saron, Gouda, Hermon).
 - Poor data security given that hard-copy data kept locally at Saron, Gouda and Hermon is subject to loss through theft or natural hazard, and is not readily available to central municipal record keeping for grave utilization monitoring and grave demand planning.
 - A common grave identification system is lacking in terms of the system used and linkage to the data base.

- (ii) **Land-Use Management** is hindered given that there has been no common zoning and technical establishment and performance criteria for cemeteries. Current negative impacts include:
 - Non-conforming uses within certain cemeteries or allocated cemetery sites (e.g. informal settlement in Simondium, unrestricted public access and vandalism in Aandblom, ad-hoc dumping and littering, etc.)
 - Poorly maintained old burial areas, resulting in such areas being conducive to non-community uses.

- (iii) **Communication and Information Transfer**
While management negotiations and burial areas have been successfully concluded (e.g. Old Apostolic Church Cemetery in Gouda and Muslim Cemetery in Wellington), additional communication with faith and church groups is required to facilitate the following:
 - Co-ordinated and programmed provision of graves where two or more cemeteries serve a single community (e.g. Saron, Simondium).
 - Re-allocation of denominational section grave space given changes in grave utilization by different faith groups.
 - Accommodating denominational groups which have specific burial requirements affecting cemetery design and grave type and orientation (e.g. Muslim).
 - Communicating different types of internment to faith groups and the public (e.g. cremations, grave recycling, mausoleums, etc).

- (iii) A lack of **Management Policy** for full cemeteries, private cemeteries, farm cemeteries and allocation of denominational sections.

2.3.8 Financial Performance

While this study is not tasked with an assessment of the “trading” performance of the municipal cemeteries, the following are identified as contributing to the financial liability for the municipality on the expenditure side:

- (i) High maintenance costs, aggravated the existing cemetery design, grave type, landscaping employed and employment of potable water for irrigation in certain instances.
- (ii) Grave development costs arising from poor geotechnical conditions requiring mechanical digging and pumping.
- (iii) Maintenance and management cost of smaller rural cemeteries (e.g. Hermon, Simondium, Saron) given low burial demand and staff and machinery transport costs.

A comparative assessment of current burial tariffs and grave selling prices of Drakenstein Municipality and those of adjacent municipalities (refer Section 4 ; Technical Annexure) reveals the following:

- (i) As in other municipalities, burial tariffs are discounted relative to establishment and maintenance costs.
- (ii) Drakenstein Municipality tariffs compare with those adjacent municipalities, but are lower than those of Stellenbosch Municipality and the City of Cape Town.
- (iii) Drakenstein has no tariff differentiation for low- and high- income earners, while in the City of Cape Town, “Category A” (higher income) residents pay three times the “Category B” (lower income) tariff.
- (iv) Regarding Drakenstein municipal burial tariffs, the following is noted:
 - While including week-end surcharges, the Municipality charges less for such services
 - No surcharges for Muslim burials
 - Surcharges for non-residents reflect those of other municipalities
 - Selling prices of niches is considerably less than elsewhere
 - No tariff reduction for multiple burials

CHAPTER 3 : KEY ISSUES, OBJECTIVES AND INTERVENTIONS

This chapter identifies key issues and a range of interventions to address cemetery performance, as highlighted in Chapter 2.

3.1 PROBLEM STATEMENT AND STRATEGIC INTERVENTION

Historic cemetery siting, years of fragmented municipal management, limited performance accountability and limited financial and technical investment currently manifests in the inadequate performance of cemeteries. Chapter 2 has highlighted the initial indicators of such performance, including environmental concerns regarding pollution, questionable user-friendliness of cemeteries, regulatory compliance, cemeteries failing to meet grave demand and cemeteries not reinforcing urban form or functioning as community spaces.

Metropolitan areas elsewhere in South African have witnessed similar cemetery issues. Where allowed to continue unchecked, a deterioration of the cemetery environment is prevailing, with socio-cultural problems of poor security and misuse of cemeteries by vagrants, the homeless and sects (e.g. Satanism) alienating user communities.

Strategic intervention in the short-term by Drakenstein Municipality is required to re-direct its cemeteries, not only as places of burial, but as dignified public places reinforcing the urban structure and underpinned by long-term sustainable environmental, built and financial performance.

KEY CEMETERY ISSUE	OBJECTIVE	INTERVENTION
(i) Displaced Provision with Insufficient Capacity to Meet Demand in Specific Geographic Areas	<ul style="list-style-type: none"> ■ Ensure strategic provision of cemetery capacity 	<p>Align existing cemetery capacity and new provision with geographic demand in the short-, medium and long-term through:</p> <ul style="list-style-type: none"> ■ Rationalization of existing denominational allocation ■ Optimal utilization of existing cemeteries ■ Identification of extensions to existing cemeteries to utilize existing facilities and retain user-community proximity ■ Identify new cemetery sites ■ Secure land through acquisition, reservation and banking for cemetery purposes
(ii) Limited Role in Urban Structuring	<ul style="list-style-type: none"> ■ To establish cemeteries as functional spaces 	<p>Incorporate cemeteries in forward planning process including:</p> <ul style="list-style-type: none"> ■ Spatial Development Framework; identified land use ■ Urban Edge; interface and buffer function ■ Urbanization Strategy; in relation to growth corridors or nodes ■ Open Space Policy; as civic spaces ■ Zoning Scheme; definition and use parameters
(iii) Limited Communication with Cultural Groups and Recognition of their Requirements	<ul style="list-style-type: none"> ■ To recognize cultural diversity and ensure communication 	<p>Interactive cultural group and faith engagement to ensure:</p> <ul style="list-style-type: none"> ■ Cemetery and denominational requirements ■ Adequate information transfer regarding burial and interment options (e.g. mausoleum) ■ Integration and eradication of racially-based burial practises ■ Awareness of cultural burial requirements ■ Equitable cemetery provision for all groups and faiths
(iv) Non-conformance with Regulatory Requirements	<ul style="list-style-type: none"> ■ To ensure regulatory compliance 	<p>Introduce monitoring and evaluation systems, to ensure:</p> <ul style="list-style-type: none"> ■ Burial data record-keeping ■ Conformance of regulations relating to environmental performance (e.g. EIA, pollution), exhumations, movement of bodies, environmental health of workers ■ Legal status of burial policies, tariffs, etc.

		<ul style="list-style-type: none"> ■ Dignity of deceased and next-of-kin, especially relating to grave maintenance and identification, and visitation security
(v) Management Limitations	<ul style="list-style-type: none"> ■ To achieve efficient and effective management and integrate cemetery management within the municipal structure 	<p>Introduce efficient system to ensure:</p> <ul style="list-style-type: none"> ■ Integration of previously fragmented cemeteries (previous municipalities) ■ Expanding current electronic data-base to include all cemeteries ■ On-going monitoring of grave allocation and demand as an informant to cemetery planning and land use allocation ■ Initiating information transfer regarding burial and internment options ■ Formulating appropriate policies (e.g. farm cemeteries)
(vi) Increasing Financial Liability	<ul style="list-style-type: none"> ■ To move towards financial sufficiency 	<p>Introduce financial initiatives and policy, to facilitate:</p> <ul style="list-style-type: none"> ■ Securing a cemetery budget through IDP prioritization ■ Regular review of tariff structure ■ Setting appropriate tariffs for different burial options ■ Pursuing cost effective cemetery designs, grave types, and level and type of landscaping (i.e. establishment and maintenance cost) ■ Appropriate cemetery site and size selection to reduce development cost and benefit from economy of scale ■ Appropriate cemetery location to reduce community travelling cost ■ Cost saving through partnerships, especially in denominational sections (e.g. maintenance, grave development etc.)
(vii) Deteriorating Environmental Condition	<ul style="list-style-type: none"> ■ To achieve a sustainable environment performance 	<p>Reduce environmental impacts through appropriate cemetery and grave design, siting and technology, including:</p> <ul style="list-style-type: none"> ■ Responding to geohydrological conditions ■ Reducing and avoiding saturated grave conditions ■ Not pumping grave leachate to ground ■ Introducing indigenous and water wise landscaping ■ Improving visual performance (e.g. screening, entrance façade) ■ Compliance with environmental requirements and legislation ■ Moving towards a park landscape
(viii) Inadequate Technical Performance	To optimize technical functioning	<p>Enforce technical criteria and supervision, through:</p> <ul style="list-style-type: none"> ■ Exploring and introducing functional cemetery design and grave types ■ Exploring alternative forms of internment (e.g. mausoleum, grave-recycling, cremation) ■ Promoting multiple cemetery use (e.g. buildings and park landscape) ■ Taking cognisance of geohydrological conditions in site selection ■ Introducing and upgrading user-friendly public infrastructure (e.g. toilets, seating)

CHAPTER 4 : STRATEGIC PROVISION FRAMEWORK

This chapter aligns existing cemetery capacity with grave demand in order to secure cemetery land to accommodate the cemetery requirement identified in Chapter 2 and achieve the strategic intervention put forward in Chapter 3.

4.1 PROVISION OBJECTIVES

Informed by the key issues and interventions outlined in Chapter 3, the following objectives are set for the utilization of existing cemeteries, the provision of extensions to such cemeteries and the identification of new cemeteries in the Drakenstein municipal area.

- (i) To maximize the use of existing cemeteries and their infrastructure, with specific emphasis on aligning grave availability in denominational sections with actual denominational demand.
- (ii) To maximize the use of existing cemetery infrastructure and facilities through cemetery extensions as opposed to establishing new sites.
- (iii) To align existing cemetery capacity with actual geographical cemetery demand, especially demand in the Paarl-Wellington "metropolitan" complex.
- (iv) To target the provision of new cemeteries at sub-regional facilities (>10ha), as opposed to smaller (<5ha) community-based facilities in order to achieve benefit of scale (i.e. financial and operational), and avoid the impact of smaller cemeteries on surrounding living areas.
- (v) To identify a centrally located "metropolitan" cemetery to address grave demand for the next 50-year period in order to benefit from a single establishment cost and economy of scale.
- (vi) To improve the environmental performance of new cemeteries, with site selection focussing on geotechnical condition, land use interface, biodiversity status, etc.
- (vii) To maximize the role and function of cemeteries in urban structuring.
- (viii) To maximize cemetery accessibility, given reliance on public transport by the majority of communities.
- (ix) To secure access to cemetery land through land reservation and land banking.

4.2 IDENTIFICATION OF NEW CEMETERY PROVISION

Informed by grave demand, existing burial rate and future grave demand in Chapter 2, the following geographic areas for new cemetery investigation were identified:

- (i) Paarl, Mbekweni, Dal Josafat and Wellington
- (ii) Simondium
- (iii) Gouda

4.2.1 New and Extension Cemetery Site Investigation : Paarl–Wellington

(Refer Section 6 : Technical Annexure)

Six new sites were identified for investigation, namely:

- (i) Erven 15279 and 15280, located immediately east of Parys cemetery, as well as the eastern portion of the existing cemetery (Erf 8431) which has not been utilized to date.
- (ii) Erf 16755 located immediately west and abutting Dal Josafat cemetery.
- (iii) Erf 16161 located north of Dal Josafat, abutting Jan van Riebeeck Road and Symphony Avenue (east).
- (iv) Vlakkeland (Erven 8384-8388 and 8395-8397) east of Jan van Riebeeck Road and south of Rand Road.
- (v) Erf 34 abutting Piet Retief Road and the existing Champagne Cemetery at Wellington.
- (vi) Erf 34 abutting Wellington Industria, and Champagne Road and the Wellington Golf Course.

Sheets 1.1 – 1.6 in Section 6 : Technical Annexure detail the site investigations for the Paarl – Wellington area (including trial pit results).

Each new cemetery site evaluation included:

- Access, especially for lower income residents
- Cultural considerations
- Environmental consideration, especially impact on indigenous vegetation and ground water
- Adjoining land use/zoning
- Current municipal assessments including:
 - Urban Edge Policy
 - Densification Policy
 - Open Space Utilization Policy
- Geotechnical considerations in terms of both water table and grave excavation
- Size, in order to achieve benefit of scale
- Ownership and availability

Summary Findings:

(i) Parys Cemetery (refer Sheet 1.1)

Not suitable given:

- High winter water table throughout the site
- High conservation value, with a recent application for conservation status
- Limited opportunity exists abutting eastern edge of existing cemetery (on existing cemetery erf, i.e. Erf 8431) given previous vegetation disturbance (old shooting range). High water table will require a cut-off drain of depth to curtail sub-surface water flow. A usable area of 6,1ha could accommodate 12 000 graves, but is restricted by conservation considerations and a high water table.

(ii) Dal Josafat (refer Sheet 1.2)

- Portion of site (2,5ha) is suitable given favourable geotechnical conditions and no conservation status. Lower portion of site is however not suitable given high water table (drainage channel)
- 2,5ha portion of the site offers opportunity to link directly to existing cemetery and optimise continued use of cemetery infrastructure (e.g. office, toilets, etc). Potential development of 5000 graves
- Favourably located relative to lower-income areas and traditional use of Dal Josafat by surrounding communities.

(iii) Erf 16161(refer Sheet 1.3)

While this site is highly suitable in terms of geotechnical conditions, access, and location relative to lower income communities, its reservation for housing excludes its consideration.

(iv) Vlakkeland (refer Sheet 1.4)

Given suitable geotechnical conditions (no free water subsequent to August 2005 flooding) and an extensive site potential (44,7ha), this site offers the following opportunities:

- (i) Development of a cemetery to serve the Paarl-Wellington urban complex over the medium to long-term (total of up to 80 000 graves)
- (ii) Development of a non-racial/multi-faith cemetery serving all communities given no geographic allegiance to any community, but being highly accessible to all Paarl-Wellington communities
- (iii) Reinforcing the urban edge

(v) Champagne (Wellington) (refer Sheet 1.5)

Suitable geotechnical conditions and the continued use of existing cemetery infrastructure favour an extension of the existing cemetery. Such extension comprises 2,2ha (4400 graves) with the opportunity to incorporate the adjacent historic burial area (old Huguenot cemetery) and a memorial park.

- (vi) **Wellington Industria (refer Sheet 1.6)**
While this 14,5ha site is highly suitable in terms of geotechnical conditions and access via the R44. However, the northern portion has a high conservation value, with a recent application for conservation status. The southern portion (5,09ha), having less conservation value is highly suitable, with a grave potential of 10 000 graves.

4.2.2 New and Extension Cemetery Site Investigation : Rural Towns (Refer Section 7 ; Technical Annexure)

Sheets 2.1 – 2.4 detail the site investigations for the rural towns. As in the case of the Paarl-Wellington cemeteries, each site was evaluated in terms of a wide variety of informants.

Summary Findings:

- (i) **Gouda (Erf 603) Old Apostolic Church Cemetery (refer Sheet 2.1b)**
The location of this cemetery (refer Sheet 2.1a) and its convenient access to the Gouda community favours its extension. While sub-surface conditions (shale) are problematic in terms of excavation (requires ripping), the location represents an extension of the existing cemetery, benefiting from dedicated off-street parking area, and availability of land. The proposed extension comprises 1,03ha (± 2000 graves)
- (ii) **Gouda (Erf 585) Municipal Cemetery (refer Sheet 2.1c)**
This cemetery, located west of Gouda (refer Sheet 2.1a) is not conveniently accessible to the Gouda community. However, infrastructure (i.e. fencing, water supply) and available space dictate its continued use, with no extension required. Available space equals 0,17ha (340 graves)
- (iii) **Hermon (refer Sheet 2.3)**
Although not fenced and lacking internal road access, this dedicated site is suited for continued use. The introduction of cut-off drains will reduce the impact of surface run-off on recently made graves. No extension required given adequate extent of 1,48ha (2960 graves)
- (iv) **Saron Municipal Cemetery (refer Sheet 2.4)**
The extent of the cemetery and infrastructure (fencing, tree planting) dictate the continued use of this dedicated site, with no extension being required. Cut-off drains will reduce the impact of surface run-off on newly dug graves. Existing vacant area (3,53ha) can provide for 6000 graves subsequent to a water course and parking allocation being made
- (v) **Simondium (refer sheet 2.2)**
Continued use of the "general" and "NG" cemeteries (both municipal), with their amalgamation subsequent to cemetery

extension into the walled informal settlement area (previous burial area).

Potential of 2220 graves, includes:

- Formalize (canalise) run-off adjacent to current "general" burial area to optimize remainder of existing "general" cemetery (0,22ha or 440 graves)
- Investigate and promote relocation of informal settlement area to release additional burial area (0,64ha or 1280 graves) and reduce impact of settlement on existing graves
- Investigate and promote amalgamation of two burial areas subsequent to relocation of informal dwellings. This will facilitate the use of 0,25ha (\pm 500 graves) within the "NG" cemetery.

4.3 MEETING MUNICIPAL AREA CEMETERY DEMAND

Informed by existing cemetery capacity (Chapter 2) and potential extension of existing cemeteries and establishment of new cemeteries (Section 4.2), Table 4 summarizes the potential grave capacity (refer Figure 1 for cemetery location).

TABLE 4 : GRAVE CAPACITY; EXISTING, EXTENSION AND NEW CEMETERIES

Cemetery	Capacity (graves)			
	Existing	Extension	New	TOTAL
(i) Existing				
Parys	4 425			4425
Dal Josafat	-			-
Voorstraat	10			10
Champagne	400			400
Simondium (general)	440			440
Simondium (NG)	500			500
Hermon	2 960			2 960
Gouda (Apostolic)	320			320
Gouda (municipal)	340			340
Saron (URC)	600			600
Saron (municipal)	6 000			6 000
TOTAL EXISTING	15 995			15 995
(ii) Extension				
Dal Josafat		5 000		5 000
Champagne		4 400		4 400
Gouda (Apostolic)		2 000		2 000
Simondium		1 280		1 280
TOTAL EXTENSION		12 680		12 680
(iii) New				
Wellington Industria			10 000	10 000
Vlakkeland			80 000	80 000
TOTAL NEW			90 000	90 000
TOTAL PROVISION	15 995	12 680	90 000	118 675

Table 5 illustrates the demand for cemetery space (municipal and private) and the total supply identified for the periods 2006–2015, 2016–2025 and 2026-2056, that is a 50 year planning horizon.

TABLE 5 : MUNICIPAL AREA CEMETERY DEMAND VERSUS SUPPLY (2006-2056)

(i) Period 2006 - 2015

TOTAL DEMAND 2006 - 2015		TOTAL MUNICIPAL AREA CEMETERY SUPPLY 2006 - 2015		
Deaths	21 432		PRIVATE	MUNICIPAL
Internment outside Municipal area	5 058	Existing Cemeteries	600 graves or 0,3ha	15 395 graves or 7,70ha
Private Cemetery burials	327 graves or 0,16ha	Extension to Existing Cemeteries	-	12 680 graves or 6,37ha
Municipal Cemeteries burials	16 047 graves or 8,02ha	New Cemeteries (partial development)	-	6 000 graves or 3,0ha
TOTAL DEMAND 2006 - 2015	16 374 graves or 8,18ha	Total	600 graves 0,3ha	34 075 graves or 17,07ha
		TOTAL SUPPLY 2006-2015	34 675 graves or 17,37ha	

(ii) Period 2016 - 2025

TOTAL DEMAND 2016 - 2025		TOTAL MUNICIPAL AREA CEMETERY SUPPLY 2016 - 2025	
Total Demand 2016-2025	18 260	Total Supply 2016-2025	20 000 graves or 10,0 ha

(iii) Period 2026 - 2056

TOTAL DEMAND 2026 - 2056		TOTAL MUNICIPAL AREA CEMETERY SUPPLY 2026 - 2056	
Total Demand 2026-2056	70 000	Total Supply 2026-2056	70 000 graves or 35,0 ha

From Table 5 the following is noted:

- (i) Identified supply in the period 2006-2015 far exceeds demand given the following:
- 11 160 of the existing vacant graves are in rural town cemeteries, while 95% of the grave demand will occur in the Paarl-Wellington area.
 - Re-allocation of the 4425 denominational graves in Parys may not be feasible.
 - Implementation of all the identified new and extension cemetery sites (e.g. Vlakkeland, Dal Josafat, Wellington Industria) may not be available given acquisition or environmental approval constraints.
 - Grave demand for the periods 2016-2025 and 2026-2056 are "broad estimates" given uncertainty regarding the impact of infectious diseases, population influx and choices regarding internment.
 - The 2026-2056 period illustrates the need for securing a centrally located "metropolitan" cemetery (e.g. Valkkeland) to meet grave demand for the next 50-year period.

4.4 STRATEGIC PROVISION

In order to align existing cemetery capacity with geographic demand, the following strategic provision in addition to existing cemetery capacity is put forward:

(i) Short-term (2006 – 2009)

- Restrict burial at Parys Cemetery to infill subsequent to denominational area and Hero's Acre re-allocation, with no extension given geotechnical and conservation constraints
- Extend Dal Josafat Cemetery to maximize benefit of existing cemetery infrastructure and central location, and to address specific short-term demand in the surrounding environs.
- Extend Champagne Cemetery to maximize benefit of existing cemetery infrastructure and short-term local demand.
- Extend Apostolic Church Cemetery in Gouda to meet local demand and given convenient community access.
- Extend Simondium "general" cemetery into area currently occupied by informal settlement, as well as increased usage of the "NG" cemetery by broader community.
- Reserve Vlakkeland (49,7ha site) and Wellington Industria Site (5,09ha) for cemetery purposes.

(ii) Medium-term (2010 – 2015)

- Initiate development of Vlakkeland as a middle to long-term cemetery for the Paarl-Wellington area to receive burials when Parys and Dal Josafat reach capacity (i.e. ± 2010 – 2012).
- Initiate development of the southern portion of the Wellington Industria site (±5ha) to service local Wellington burial needs subsequent to Champagne Cemetery reaching capacity (i.e. ± 2012 - 2015).

(iii) Long-term (2015 – 2020)

- Phased development of Vlakkeland and Wellington Industria site to serve Paarl-Wellington urban complex.

(iv) Post 2020

- Phased development of Vlakkeland.

CHAPTER 5 : MANAGEMENT GUIDELINE INFORMANTS

Chapter 5 identifies guidelines and priority initiatives to inform the effective and efficient planning, development, operation and management of cemeteries.

5.1 MANAGEMENT GUIDELINES

In addressing the key issues confronting cemeteries and their performance, interventions are put forward in Chapter 3.

Chapter 4 identifies the necessary management objectives and strategic provision to address existing and future cemetery demand.

Similarly, management, maintenance, design and infrastructure requirements are put forward for both existing cemeteries and new cemeteries in Sections 8 and 9 of the Technical Annexure respectively. These include detail guidelines concerning geohydrological requirements, environmental management, maintenance, facility and access design and development, and space utilization and management.

These interventions and management and development requirements collectively represent management guideline informants and are not repeated here.

5.2 SPECIFIC GUIDELINES

Critical to the future functioning of cemeteries in the Drakenstein municipal area and the Drakenstein Municipality achieving the required strategic intervention to re-direct cemetery development and performance, are the following guidelines:

(i) Cemetery Design

Cemetery design needs to achieve cost efficient development and maintenance, urban integration and focus, status as a civic space and a post cemetery function.

The cemetery design guidelines illustrated in Diagram 4 address these objectives and focus on the following design components:

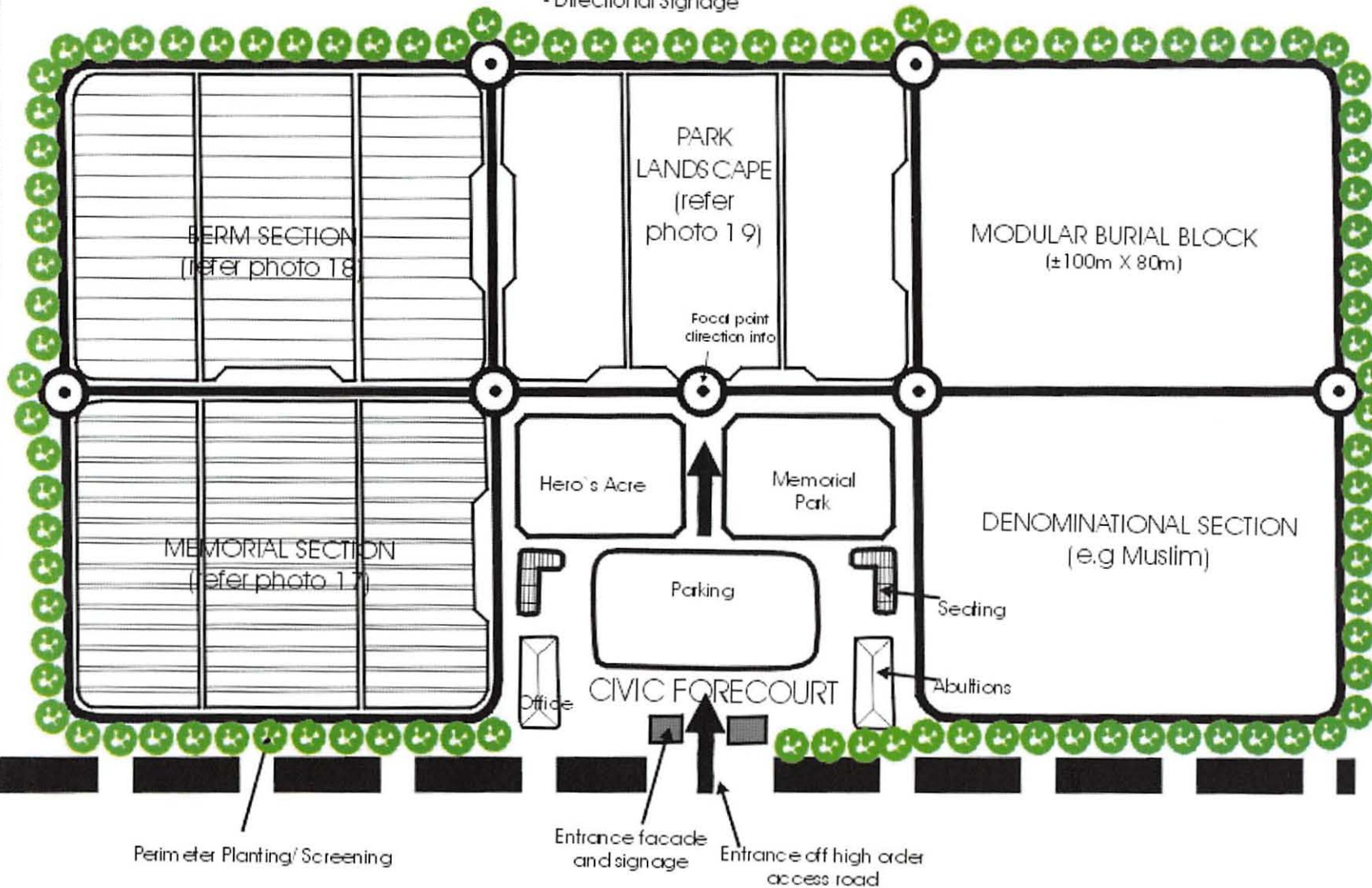
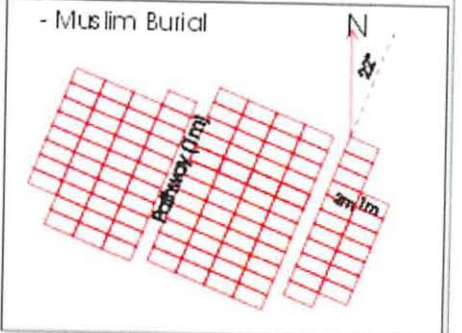
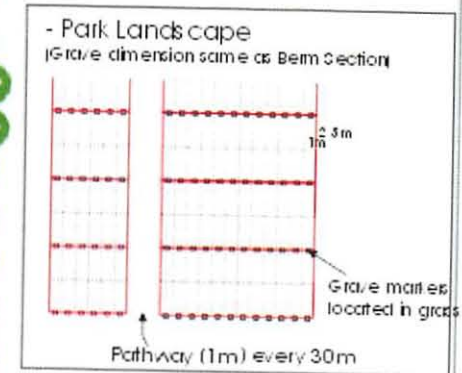
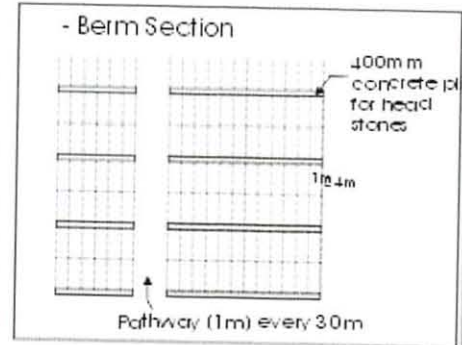
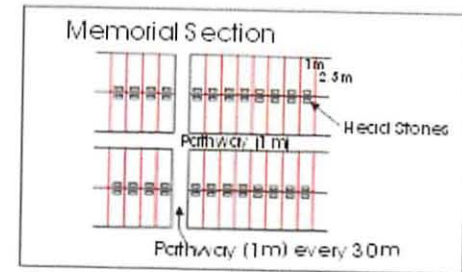
- A civic forecourt orientated onto a high order access road, clearly identified by a visually prominent entrance façade. The civic forecourt represents the civic space, containing all public and management facilities, public parking, hero's acre and memorial park, niche wall or mausoleum. Located at the cemetery entrance and abutting a high order road facilitates post cemetery use of the forecourt and its facilities for community purposes (e.g. clinic, social gathering).
- A modular burial block design which affords various development options given its rectilinear shape, orientation flexibility, phasing of development, improved user legibility and accommodation of a broad range of denominational allocations (e.g. Muslim) and graves types (e.g. berm, park landscape or memorial).
- Landscaping being limited to functional planting, focussing on perimeter planting to achieve visual screening, site definition and climatic protection. Decorative planting being restricted to the civic forecourt (e.g. memorial park), with built structures being employed to achieve

DIAGRAM 4: CEMETERY DESIGN COMPONENTS

- Modular Burial Block
 - Rectilinear shape
 - Orientation flexibility
 - Phased development
 - Grave type and Denominational allocation
- Access Roads
 - 4-5m reserve
 - Off road parking for hearse - family vehicles

- Civic Forecourt
 - Concentration of Built Structures
 - Public Facilities (toilets, seating)
 - Hero's Acre
 - Memorial Park (niche walls)
 - Public Parking
- Landscaping
 - Focus on perimeter planting & civic forecourt
 - Indigenous water-wise planting
 - Directional Signage

• GRAVE DIMENSIONS



shaded seating, focal and direction points, given the lower maintenance cost.

(ii) Grave Types

Cemeteries need to include a range of grave types in order to achieve the following:

- Wider public choice
- Options to suit different levels of user-affordability
- Opportunity for differential tariffs, linking grave cost to maintenance liability
- Improved space utilization
- Post burial land-use options

Diagram 4 and photos 17-19 illustrate the following three grave type options, their respective layouts and grave dimensions:

- **Memorial or monumental**, including both headstone and grave monumental works, with maintenance cost implications given no opportunity for strip mowing.
- **Berm**, including only headstones of a prescribed size and shape which are fixed to a cast concrete plinth. Subsequent to grave-fill settlement, all areas between the rows of headstones are levelled and planted with a ground cover (e.g. grass, indigenous ground cover). As illustrated in photo 18, this grave type eliminates the maintenance problems associated with grave mounds and facilitates mechanical (strip) mowing as opposed to weed cutting.
- **Park Landscape** (photo 19), employing a similar layout to the berm grave type, replaces the headstone with a grave identification marker set in concrete at grass level in order to facilitate strip mowing.

Both the berm and park landscape grave types offer post cemetery use options (e.g. parkscape, passive recreation).

The modular burial block design illustrated in Diagram 4 facilitates the separation of these grave types in order to avoid the current practise where monumental and grave mounds occur together, with significant maintenance implications.

(iii) Alternative Internment Options

Competition for available space, the uneconomic employment of land for burial purposes and an on-going maintenance liability necessitate the serious consideration and pursuance of the following alternative internment options:

- **Multiple burials** (i.e. two burials per grave) effects a significant space saving, but is subject to the following considerations:
 - Consumer resistance, often overcome by offering significant burial tariff reductions
 - Suitable sub-surface conditions to permit increased grave depth ($\pm 2,0\text{m}$) and grave covering (1,0m) notably ease of excavation and level of winter water table
 - No monumental works, only grave identification.

Multiple burial can best be accommodated in a berm or park landscape section.

- **Grave recycling**, a burial option practised in several countries, offers the opportunity of cemetery recycling every 15-20 years, thereby eliminating dormant cemeteries, their management and maintenance liabilities, as well as the reservation of new burial areas.

Recycling however, requires the following considerations:

- It requires introduction with new burial contracts as the requirements of exhumation for existing graves would be too onerous and costly for authorities.
 - Consumer education is critical given strong community and individual association with cemeteries as “places of memory” or of cultural and historical significance.
 - Recycling needs to include up-front arrangements in the burial contract for interment (e.g. cremation, re-burial) of the remains at the time of recycling.
 - Suitability of geo-hydrological conditions given that the re-use of graves in areas with poor conditions (e.g. water-logging) will only perpetuate a continued poor grave performance with a renewed groundwater pollution threat.
- **Cremation** offers the best opportunity to reduce the demand for cemeteries, but its promotion requires the following:
 - Significant cultural and faith re-orientation, a process requiring significant time and effort.
 - Stringent regulations for crematoria, as it is often mistrust of the operation management that discourages its application as a means of interment.
 - Adequate facilities and information transfer regarding storage, safekeeping or disposal of ashes. A lack of such information and fear of receiving ashes often deters next-of-kin from encouraging cremation amongst family members.
 - Development of attractive facilities (e.g. garden of remembrance, wall of remembrance, niche walls) to accommodate ashes and create a “place of memory” (refer photo 20)
 - **Mausolea** (photo 21), or other forms of multi-level above ground interment, offer the following advantages over in-ground burial:
 - Represent a space intensive alternative, reducing grave space demand.
 - Are suited to areas of poor geohydrological performance (e.g. rocky and wet).
 - Can be constructed in vacant areas within dormant cemeteries thereby extending facility usage and improving security.
 - Offer opportunities for public-private partnerships for both construction and maintenance.
 - Represent a more acceptable alternative interment option as it includes traditional burial elements, namely a coffin burial.
 - Represent a more “secure” interment option, given questionable in-ground burial management (e.g. grave identification, illegal exhumations, etc).



Photo 17 : Memorial



Photo 18 : Berm



Photo 19 : Park Landscape



Photo 20 : Niche Wall

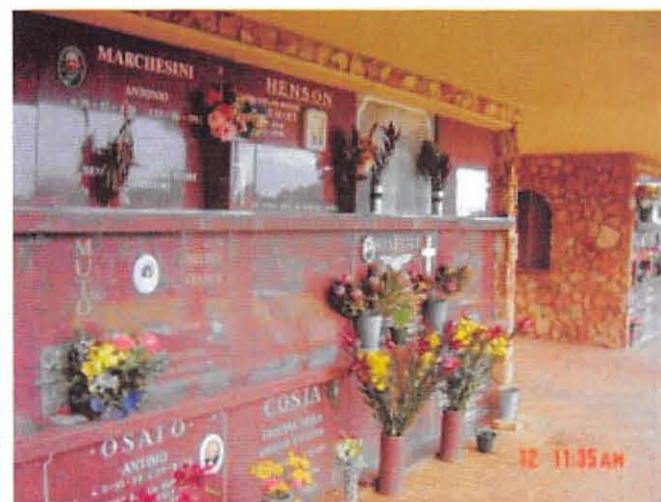


Photo 21 : Mausoleum

5.3 MANAGEMENT INITIATIVES

The following short-term management initiatives are identified as critical to the improved performance of cemeteries and achieving the required strategic intervention:

- (i) Rationalizing current denominational grave allocations (e.g. Parys) to inform short-term grave availability.
- (ii) Initiating the required acquisition, planning, approval and development processes to release grave space at Dal Josafat, Champagne, the Apostolic Church Cemetery at Gouda and Simondium municipal cemetery given pending short-term grave shortfalls.
- (iii) Conducting preliminary feasibility assessments (e.g. geotechnical, botanical, heritage) to ascertain the extent of site suitability for burial at Vlakkeland and Wellington Industria (refer Section 9 ; Technical Annexure).
- (iv) Implementation of stormwater management programmes (i.e. design and construction) at all cemeteries where cemetery operation is being negatively impacted (e.g. Parys, Simondium, Hermon) (refer Sections 3 and 8 ; Technical Annexure).
- (v) Introduction or upgrading cemetery infrastructure and facilities (e.g. toilets, showers, fencing, parking areas, access roads) to meet operational and regulatory requirements (e.g. Hermon Cemetery, Apostolic Church Cemetery in Gouda, Saron municipal cemetery and Simondium municipal cemetery (refer Sections 3 and 8 ; Technical Annexure).
- (vi) Establishing an information transfer and consultation platform (e.g. newsletter, forum, workshops) for sharing grave and internment options with the public and cultural-faith groups, engaging public-private partnerships (e.g. cemetery maintenance and development) and achieving endorsement of cemetery policy issues (e.g. tariff structure).
- (vii) Aligning tariff structure with burial product (e.g. grave type) in order to improve revenue streams and promote burial types (e.g. multiple burial, berm and park landscape) and internment options (e.g. cremation).
- (viii) Extending the current cemetery electronic data-base to include Saron, Hermon and Gouda cemeteries, including data capture of historic burial records.
- (ix) Introducing a groundwater monitoring programme in the vicinity of selected cemeteries to assess pollution hazard.

CHAPTER 6 : CONCLUSION

The Drakenstein Cemetery Study calls for strategic intervention in the approach to the siting, developing and managing of the Municipality's cemeteries. As such the study seeks to initiate and inform cemetery policy for the municipal area, with the following initiatives and objectives:

- (i) Initiating land acquisition, reservation and banking for cemetery purposes.
- (ii) Stimulating and harnessing appropriate burial innovation and the exploring of alternative grave types and alternative interment options.
- (iii) Contributing to achieving greater sustainability and efficiency in cemetery development, operation and management.
- (iv) Realizing cemeteries as functional civic spaces in order to afford dignity to the deceased and their next-of-kin.
- (v) Embracing public and cultural-faith groups in cemetery matters and decision making.

- No understanding / analysis of historical / social role of cemeteries. (places of memory)
- No analysis of urban design opportunities; role of cemeteries as community social spaces / open (public)
- Formal protection of burial sites in NHA Act

TECHNICAL ANNEXURE

- SECTION 1 : Demographic Characteristics**
- SECTION 2 : Current Grave Demand per Cemetery**
- SECTION 3 : Existing Cemetery Performance**
- SECTION 4 : Burial Tariff Analysis**
- SECTION 5 : Parys Cemetery : Potential Grave Infill**
- SECTION 6 : New Cemetery Site Investigation : Metropolitan**
- SECTION 7 : New Cemetery Site Investigation : Rural Towns**
- SECTION 8 : Existing Cemeteries; Management, Maintenance and Infrastructure Development Requirements**
- SECTION 9 : New Cemeteries; Management, Design and New Infrastructure Requirements**
- SECTION 10 : Legislation**

SECTION 1 : DEMOGRAPHIC CHARACTERISTICS

Tables 1,2 and 3 detail various demographic characteristics informing grave demand and the programming of grave supply.

TABLE 1 : 2001 POPULATION : DRAKENSTEIN MUNICIPALITY (CENSUS 2001)

	Black African	Coloured	Indian or Asian	White	Total
Dal Josafat Forest Reserve	3	52	-	10	65
Paarl NU	3631	18792	31	2891	25345
Wellington NU	814	9469	6	1179	11467
Drommedaris	1372	13	-	-	1384
Gouda	197	2324	-	58	2578
Mbekweni	21745	134	7	-	21886
Mbekweni	708	-	-	-	708
Amstelhof	138	4190	3	4	4334
Charlston Hill	29	1880	39	14	1961
Chicago	172	7790	51	60	8073
Courtrai	13	97	5	1070	1184
Dal Josafat Industria	16	184	-	115	315
Dalvale	240	2245	7	-	2492
De Zoete Inval	5	28	-	636	668
Denneburg	20	177	6	704	907
Dennenburg	3	157	-	449	609
Drommedaris	3272	3	-	-	3275
Fairyland	338	140	-	-	478
Groenheuwel	1505	6430	5	3	7944
Groenvlei	-	56	-	618	675
Huguenot	14	1451	3	14	1482
Kingston Town	14	353	-	-	367
Klein Nederburg	183	11886	17	19	12105
Klein Parys	19	1412	16	29	1476
Langvlei	15	2363	136	26	2540
Lemoenkloof	10	56	4	728	798
Mbekweni	1338	7	-	-	1345
Milky Town	286	569	-	3	858
New Orleans	81	3040	26	19	3165
Northern Paarl	9	68	12	2658	2747
Paarl	73	292	3	25	393
Paarl Central East	125	753	11	4931	5820
Paarl Central West	158	1050	18	3340	4567
Paarl East	86	8453	25	19	8582
Smartie Town	500	758	-	-	1259
Suider Paarl	11	213	3	1206	1434
Vrykyk	10	24	-	827	862
Paarlberg Nature Reserve	-	27	-	-	27
Saron	37	5948	11	5	6001
Victor Verster	468	2233	11	318	3030
Berg-En-Dal	3	50	19	1044	1117
Dalvale	9	66	-	9	84
Hillcrest	88	8854	17	19	8977
Van Wyks Vlei	3418	12483	92	-	15993
Wellington	108	1331	3	-	1442
Wellington Central	32	4884	7	127	5050
Wellington North	108	1121	-	5160	6389
Wellington Open Space	87	59	-	10	156
TOTAL	41 511	123 965	594	28 347	194 417

Source: SA Statistical Services (2001)

TABLE 2 : POPULATION GROWTH, BIRTH RATE, DEATH RATE AND TOTAL DEATHS

YEAR	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
POPULATION	196064	193983	194144	194247	194472	194827	194462	194019	193563	193057	192606	192131	191619	191136	190619
BIRTH RATE (%)	0.0204	0.0202	0.02	0.0199	0.0198	0.0197	0.0195	0.0192	0.019	0.0188	0.0185	0.0182	0.0179	0.0176	0.0174
DEATH RATE (%)	0.0085	0.0088	0.0091	0.0093	0.0095	0.0098	0.0101	0.0104	0.0107	0.011	0.0113	0.0116	0.0119	0.0121	0.0123
TOTAL DEATHS	1659	1713	1768	1806	1850	1910	1966	2022	2076	2129	2183	2229	2272	2307	2338
TOTAL DEATHS 2006-2015															21432

Source: Dept. of Social Welfare and Poverty Alleviation (PGWC) 2006

TABLE 3 : TOTAL POPULATION, TOTAL HIV INFECTIONS, NON-AIDS DEATHS AND AIDS DEATHS

YEAR	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
TOTAL POPULATION	196064	193983	194144	194247	194472	194827	194462	194019	193563	193057	192606	192131	191619	191136	190619
TOTAL HIV INFECTIONS	5006.3	5782.1	6479.7	7146	7774.3	8359.3	8797.9	9150	9422.8	9619.9	9749.7	9818	9833.5	9807.7	9746.9
NON-AIDS DEATHS	1471.4	1469.3	1485.3	1503.6	1523.4	1544.7	1562.1	1579.6	1597.1	1614.8	1636.6	1658.2	1679.7	1701.2	1722.1
AIDS DEATHS	188.21	243.57	282.83	301.77	326.9	365.33	404.08	442.15	479.01	514.46	545.71	571.5	591.51	606.1	615.77

Source: Dept. of Social Welfare and Poverty Alleviation (PGWC) 2006

SECTION 2 : CURRENT GRAVE DEMAND PER CEMETERY

Tables 4 – 13 illustrate burials over the period 2000 – 2005 (June) per cemetery, as well as the annual average (burials/year) and the average annual spatial requirement (m²). Also included are private cemeteries in order to assess their impact on grave demand and supply in the municipal cemeteries. Data sourced from municipal records and burial committees (private cemeteries).

TABLE 4 : CHAMPAGNE CEMETERY : WELLINGTON (Municipal)

YEAR	NO. OF BURIALS
1999	276
2000	301
2001	388
2002	319
2003	333
2004	426

2005 up to 30 May = 155 burials
 Annual average (1999 to 2004) = 340 burials / year
 Annual spatial requirement = 0,17 ha or 1700 m²

TABLE 5 : SIMONDIUM GENERAL CEMETERY (Municipal)

YEAR	NO. OF BURIALS
2000	107
2001	99
2002	56
2003	52
2004	46

Annual average (2000 to 2004) = 72 burials / year
 Annual spatial requirement = 0,036 ha or 360 m²

TABLE 6 : SIMONDIUM "NG KERK" CEMETERY (Municipal)

YEAR	NO. OF BURIALS
2000	0
2001	1
2002	1
2003	0
2004	0

Annual average (2000 to 2004) = 0,4 burials / year
 Annual spatial requirement = < 2 m²

TABLE 7 : HERMON CEMETERY (Municipal)

YEAR	NO. OF BURIALS
2000	25
2001	24
2002	8
2003	7
2004	3

Annual average (2000 to 2004) = 13,4 burials / year
 Annual spatial requirement = 67,0 m²

TABLE 8 : GOUDA CEMETERY (Municipal)

YEAR	NO. OF BURIALS
2000	No records
2001	No records
2002	1
2003	0
2004	0

2005 up to June = 1 burial
 Annual average (2000 to 2004) = <1 burials / year
 Annual spatial requirement = 5 m²

TABLE 9 : GOUDA : OU APOSTOLIESE KERK CEMETERY (Private)

YEAR	NO. OF BURIALS
2000	50
2001	38
2002	69
2003	37
2004	29

2005 till June = 20 burials
 Annual average (2000 to 2004) = 44,6 burials / year
 Annual spatial requirement = 223 m²

TABLE 10 : SARON CEMETERY (Municipal)

YEAR	NO. OF BURIALS
2000	7
2001	14
2002	16
2003	26
2004	33

2005 up to 30 June = 15 burials
 Annual average (2000 to 2004) = 19 burials / year
 Annual spatial requirement = 95 m²

TABLE 11 : SARON : VEREENIGDE GEREFORMEERDE KERK CEMETERY (private)

YEAR	NO. OF BURIALS
2000	43
2001	49
2002	49
2003	45
2004	57

2005 till June = 23 burials
 Annual average (2000 to 2004) = 48,6 burials / year
 Annual spatial requirement = 243 m²

TABLE 12 : DAL JOSAFAT CEMETERY (Municipal)

YEAR	CHILDREN	GENERAL	TOTAL
2000	48	218	266
2001	55	291	346
2002	55	225	280
2003	34	158	192
2004	31	2	33

Annual average (2000 to 2004) = 223,4 burials / year
 Annual spatial requirement = 0,1117 ha or 1117 m²

TABLE 13 : PARYS CEMETERY : PAARL (Municipal)

<u>DENOMINATION</u>	2000	2001	2002	2003	2004	ANNUAL AVERAGE (burials/yr)	ANNUAL SPATIAL REQ.MENT (ha / m ²)
7 th DAY	6	0	2	0	2	2	10 m ²
AGS	9	11	7	12	10	10	50 m ²
ALG	0	1	0	0	0	<1	5 m ²
ALG SENDING	0	0	0	0	0	0	0 m ²
AME	3	9	11	4	9	7	35 m ²
BETHEL	53	53	55	40	59	52	260 m ²
CALVYN	0	1	3	2	6	2,4	12 m ²
CHRIST. BRETH	0	0	1	1	1	1	5 m ²
CONGREGATIONAL	0	0	0	0	1	<1	5 m ²
DUITS. LUTH	2	0	0	1	0	1	5 m ²
EBENEZER	4	4	4	5	3	4	20 m ²
GEREF.	4	0	1	1	1	1,4	10 m ²
HEBREW	2	4	4	2	3	3	15 m ²
HERO'S ACRE	0	2	1	0	0	1	5 m ²
HERV. KERK	0	0	0	0	0	0	0 m ²
HOLY TRINITY	9	14	11	9	7	10	100 m ²
IMMANUEL	35	26	24	26	25	27	136 m ²
MAURITZ UYS	0	1	1	0	0	1	5 m ²
MUSLIM	9	20	15	13	13	14	70 m ²
NG PAARLVALLEI	0	0	2	0	0	1	5 m ²
NOORDER PAARL	35	32	36	18	22	29	143 m ²
NUWE APOST	2	0	0	0	0	1	5 m ²
ONSEKTARIES	1	6	2	1	3	2,6	13 m ²
OU APOSTOLIES	12	18	35	27	40	26,4	132 m ²
PAARL	18	23	16	15	12	16,8	84 m ²
PARYS GEN.	201	232	282	258	378	270	1351 m ²
PARYS GEN. CHILD	3	10	16	17	25	14,2	71 m ²
WALL 5	0	1	0	0	0	N/A	N/A
WALL 6	0	0	1	0	0	N/A	N/A
PINKS PROTESTANT	3	2	2	3	4	2,8	14 m ²
ROMAN CATHOLIC	18	26	24	16	13	19,4	97 m ²
ROMAN CATH CHILD	0	0	1	0	0	<1	5 m ²
SALVATION ARMY	1	0	0	0	0	<1	5 m ²
SIONS	59	62	78	52	48	59,8	299 m ²
SUIDER PAARL	76	60	68	57	57	63,6	318 m ²
SIONS CHILD	0	0	1	0	0	<1	5 m ²
ST STEPHENS	0	0	1	0	0	<1	5 m ²
TOTAL	565	618	705	580	742	642	3210m²

SECTION 3 : EXISTING CEMETERY PERFORMANCE

Performance of the existing cemeteries was evaluated in accordance with the following indicators.

Existing Cemetery	PERFORMANCE INDICATOR					
	Geohydrological	Environmental	Maintenance	Facilities	Access	Space utilisation
<p>(i) Parys Cemetery</p> <ul style="list-style-type: none"> Erf: 8431 Paarl Extent: 44,8ha Ownership: Paarl Municipality Zoning: Split Zoning Use: Cemetery 	<ul style="list-style-type: none"> Clayey sand between boulders, with perched water table on top of in-situ weathered clay. Clay underlying the paleo-gravel can cause an up-welling of water inside grave excavations Matrix between boulders and gravel is clayey with low permeability, resulting in dug graves retaining surface run-off which enters holes Poor geohydrological performance of graves requires pumping and results in newly filled grave flooding and collapsing of 	<ul style="list-style-type: none"> Alien plant problem in parts High ground and surface water pollution threat given high occurrence of saturated grave conditions (i.e. an anaerobic environment) Poor environmental health condition and high risk for workers (and public) given waterlogged working conditions during grave digging, burials and exhumations Pump to ground practice potentially causing ground and surface water pollution Use of 	<ul style="list-style-type: none"> Stormwater canals and cut-off trenches need repair in places and cleaning Main cut-off trench on eastern boundary poorly maintained and not adequately developed (depth) towards the southern portion of eastern boundary Poor stormwater management resulting in stormwater erosion of roads, stormwater entry into dug and recently filled graves Eroded areas and internal roads in need of 	<ul style="list-style-type: none"> Adequate facilities, incl. public toilets, offices, staff ablutions, store-room Niche Wall Hero's Acre which is mostly undeveloped 	<ul style="list-style-type: none"> Adequate access with main access off Jan van Riebeeck, and additional access off Langenhoven Adequate parking 	<ul style="list-style-type: none"> Excessive size of Hero's Acre Poor space utilization due to denominational allocation Eastern portion abutting Erf 15280 vacant (poor geohydrological performance and biodiversity priority) Potential infill of 4425 graves within denominational areas and Hero's Acre Grave shortfall in "general" section Predominantly monumental, with grave mounds in "general" section and older sections (e.g. Old Apostolic)

	<p>monumental works, as well as anaerobic decomposition with potential pollution due to grave leachate</p> <ul style="list-style-type: none"> Refer trial hole profiles in Section 6 	<p>detergents (e.g. Jeyes Fluid) during grave digging and exhumations potentially causing ground and surface water pollution</p> <ul style="list-style-type: none"> Visual quality high with good screening Prominent entrance façade gives cemetery strong identity Secure perimeter fence 	<p>repair / stabilisation / erosion control</p> <ul style="list-style-type: none"> Large portion of graves in eastern portion overgrown with alien vegetation (Old Apostolic section) Cemetery is well maintained 			
<p>(ii) Champagne Cemetery</p> <ul style="list-style-type: none"> Erven: 34, 1552, 1740, 1553, 1554 Wellington Extent: 5,5ha Zoning: Cemetery Use: Cemetery 	<ul style="list-style-type: none"> Coarse silty sand and pebbles overlying a wet yellow stiff clay Need to caution against surface stormwater flow which results in water ingress into graves Need to cut-off water-flow on clay material through adequate depth of cut-off drains Refer trial hole profile in Section 6 	<ul style="list-style-type: none"> Use of detergents (e.g. Jeyes Fluid) during grave digging and exhumations potentially causing ground and surface water pollution Visual quality high but screening and entrance façade can be improved, as well as planted screening along boundary abutting residential areas to west 	<ul style="list-style-type: none"> Cemetery is well maintained Stormwater run-off within cemetery due to slope resulting in roadway erosion 	<ul style="list-style-type: none"> Needs ablution and shower facilities for staff and public Storage facilities need increased capacity Existing wall of remembrance 	<ul style="list-style-type: none"> Adequate access (2 entrances) off Champagne Adequate parking area off Piet Retief – Champagne intersection 	<ul style="list-style-type: none"> Optimum space utilization Jewish denominational section under-utilized Capacity being reached, with 400 grave capacity remaining Potential expansion to south on undeveloped portions of Erf 34 totalling 2,2ha (4 400 graves), with potential to incorporate historic

		<ul style="list-style-type: none"> • Previous poor stormwater management resulting in complaints from neighbours was rectified through installation of a cut-off drain • Secure perimeter fence 				<p>Huguenot cemetery and a memorial garden</p> <ul style="list-style-type: none"> • Predominantly monumental
<p>(iii) Simondium (general section) Cemetery</p> <ul style="list-style-type: none"> • Erf: 0 South Farms • Extent: 7,5ha • Zoning: Open Space • Use: Cemetery, with lower portion used for agriculture 	<ul style="list-style-type: none"> • Clayey gravel and pebble (rocks) with difficult excavation • Poor surface run-off management results in water logging of dug graves and water ingress into existing graves resulting in collapsed grave fill • No geotechnical investigation undertaken 	<ul style="list-style-type: none"> • Alien plant infestation problem • Solid waste (litter) visible • Illegal informal settlement • Poor visual performance as a result of poor maintenance and informal layout • Lacks identity (no signage, entrance façade, etc) • Perimeter poorly secured (no fence) 	<ul style="list-style-type: none"> • Poor maintenance performance due to informal layout and low level of grave development which contributes to high maintenance costs • Uncontrolled water flow through southern portion • Uncontrolled pedestrian access through cemetery 	<ul style="list-style-type: none"> • Lacking in facilities (no facilities) 	<ul style="list-style-type: none"> • Poor access off gravel road • No formal parking area • No connection/linkage to abutting NG cemetery section 	<ul style="list-style-type: none"> • Poor space utilization due to informal layout of cemetery • No defined boundary (e.g. along southern edge) • 7-8 graves within informal settlement area • Lower portion of Erf 0 not suitable for burial as low lying and presence of high water table • Predominantly grave mounds • Limited expansion due to informal settlement
<p>(iv) Simondium (NG Section) Cemetery</p>	<ul style="list-style-type: none"> • Clayey gravel and pebble (rocks) with difficult 	<ul style="list-style-type: none"> • High environmental performance • Attractive and 	<ul style="list-style-type: none"> • Well maintained with high level of grave development 	<ul style="list-style-type: none"> • No facilities present, but due to low level of usage none 	<ul style="list-style-type: none"> • Direct access off tarred road • Adequate parking in road 	<ul style="list-style-type: none"> • Optimum space utilization due to formal layout • Predominantly

<ul style="list-style-type: none"> Erf 0 South Farms Extent: 7,5ha Zoning: Open Space Use: Cemetery, with lower portion used for agriculture 	<ul style="list-style-type: none"> excavation No geotechnical investigation undertaken 	<ul style="list-style-type: none"> visually prominent entrance façade Formal internal layout Secure perimeter wall and gate 	<ul style="list-style-type: none"> (e.g. monumental structures) 	<ul style="list-style-type: none"> required High level of infrastructure (e.g. roadway and kerbing) 	<ul style="list-style-type: none"> reserve 	<ul style="list-style-type: none"> monumental
<p>(v) Hermon Cemetery</p> <ul style="list-style-type: none"> Erf 0 Hermon Extent: 2,85ha Zoning: Open Space Use: Cemetery 	<ul style="list-style-type: none"> Sandy clay with danger of water logging, especially from uncontrolled stormwater ingress No geotechnical investigation undertaken 	<ul style="list-style-type: none"> Visual performance low due to site not being formally demarcated and poor maintenance (overgrown) No perimeter screening Lacks identity due to no signage and no entrance façade Potentially a source of surface and groundwater contamination due to surface water ingress into graves Poorly secured perimeter (no fence) 	<ul style="list-style-type: none"> Poor maintenance performance resulting in overgrown appearance and poor grave visibility Uncontrolled stormwater management with flow from surrounding agricultural area resulting in water ingress into graves and the collapsing of grave fill and mounds 	<ul style="list-style-type: none"> Totally lacking in facilities (no facilities) Stormwater drains along western and southern edge inadequate 	<ul style="list-style-type: none"> Access off gravel road No parking area, with graveyard access subject to surface flooding 	<ul style="list-style-type: none"> Poor space utilization due to low intensity of burials South-eastern corner portion low-lying (suitable for garden) Northern portion used for garden refuse disposal Predominantly grave mounds
<p>(vi) Gouda (Old Apostolic Church) Cemetery</p>	<ul style="list-style-type: none"> Leiklip results in difficult excavation (mechanical) 	<ul style="list-style-type: none"> Moderate visual performance due to moderate 	<ul style="list-style-type: none"> Moderate maintenance performance, with older parts 	<ul style="list-style-type: none"> No facilities present (e.g. toilet or water point) 	<ul style="list-style-type: none"> Direct access off tarred residential access road 	<ul style="list-style-type: none"> Optimum space utilization Limited grave capacity

<ul style="list-style-type: none"> Erf: 603 Gouda Extent: 1,4ha Zoning: Institutional Use: Religion / Cemetery 	<ul style="list-style-type: none"> No water table present No geotechnical investigation undertaken 	<ul style="list-style-type: none"> maintenance Lacking in perimeter screening Lacks identity (no signage and no entrance façade) Perimeter fence in poor condition 	<ul style="list-style-type: none"> of cemetery neglected and resulting in poor grave visibility and access (overgrown and alien infestation) 		<ul style="list-style-type: none"> Existing parking area is undeveloped and subject to water logging (i.e. mud) 	<ul style="list-style-type: none"> Potential expansion area to the east Mixture of monumental and mounds
<p>(vii) Gouda Cemetery (municipal)</p> <ul style="list-style-type: none"> Erf: 585 Gouda Extent: 0,25ha Zoning: Agricultural Use: Cemetery (remainder of erf is agriculture) 	<ul style="list-style-type: none"> Clay gravel with no significant drainage or excavation problems No geotechnical investigation undertaken 	<ul style="list-style-type: none"> Visual performance acceptable due to rural setting and tree planting Lacks identity (no signage, entrance façade, etc) Well secured perimeter (fence and gate) 	<ul style="list-style-type: none"> Maintenance performance moderate given low level of usage 	<ul style="list-style-type: none"> Facilities limited to a tap 	<ul style="list-style-type: none"> Direct access from gravel rural access road. Location distant from Gouda community 	<ul style="list-style-type: none"> Optimum space utilization Low level of usage Predominantly monumental
<p>(viii) Saron Cemetery (Municipal)</p> <ul style="list-style-type: none"> Erf: 0 Extent: 3,87ha Zoning: Split Zoning Use: Cemetery 	<ul style="list-style-type: none"> Clayey gravel over stiff clay, with water logging of open graves due to stormwater ingress No geotechnical investigation undertaken 	<ul style="list-style-type: none"> Moderate visual performance Planted perimeter and internal screening Lacks identity (no signage and no entrance façade, etc) Current entrance near corner of road intersection 	<ul style="list-style-type: none"> Moderate maintenance performance Presence of surface run-off into open graves indicates need for internal stormwater drainage 	<ul style="list-style-type: none"> Facilities limited to a store (coffins) No toilet or water point Street lighting along northern boundary, with sewer along western boundary Lack of stormwater management 	<ul style="list-style-type: none"> Poor safety performance of entrance due to corner intersection No parking area Public Works programme currently upgrading road along northern boundary, together with stormwater 	<ul style="list-style-type: none"> Significant vacant space Current graves optimally located Mixture of monumental and mounds

		<p>which presents a safety risk for visitors/users</p> <ul style="list-style-type: none"> Perimeter fence in good condition 			<p>drain and sidewalk development</p>	
<p>(ix) Dal Josafat Cemetery</p> <ul style="list-style-type: none"> Erf 0 Paarl Extent: 6,0ha Zoning: Cemetery Use: Cemetery 	<ul style="list-style-type: none"> Silty clay and pebbles on firm clay layer, with danger of perched water table and water logging due to stormwater ingress Refer Section 6 for trial hole profiles 	<ul style="list-style-type: none"> Poor visual performance owing to poor maintenance Poor visual screening Poor wind screening leading to wind erosion of grave mounds No entrance façade 	<ul style="list-style-type: none"> Poor maintenance performance as a result of high costs associated with maintaining a cemetery with low level of grave development (i.e. mounds) 	<ul style="list-style-type: none"> Facilities include caretaker residence, office and toilets 	<ul style="list-style-type: none"> Direct tarred access off Bo-Dal-Josafat Gravel parking area 	<ul style="list-style-type: none"> Full except for family and child burials Predominantly mounds
<p>(x) Voorstraat Cemetery</p>	Not evaluated	<ul style="list-style-type: none"> Lacks identity as it has no entrance façade Good visual performance due to good maintenance 	<ul style="list-style-type: none"> Well maintained except for older area abutting Mosque which is overgrown (grass) 	<ul style="list-style-type: none"> No facilities 	<ul style="list-style-type: none"> Direct access off Voorstraat, with gravel off-street parking area 	<ul style="list-style-type: none"> Cemetery full, with limited burial in Muslim denominational section
<p>(xi) Bloekomlaan Cemetery</p>	Not evaluated	<ul style="list-style-type: none"> Lacks identity as it has no entrance façade Damaged perimeter fence results in cemetery being used as a thoroughfare by pedestrians Southern and western boundaries 	<ul style="list-style-type: none"> Poor maintenance of infrastructure and vegetation Adhoc dumping Limited perimeter planting 	<ul style="list-style-type: none"> High light mast in middle of cemetery Public ablutions present 	<ul style="list-style-type: none"> Direct access from surrounding streets (Aandblom, Mossie and Bloekom) 	<ul style="list-style-type: none"> Cemetery full

		include vibracrete wall <ul style="list-style-type: none"> • Vandalism and illegal dumping cause low visual performance • Poor visitor security 				
(xii) Mountain Drive Cemetery	Not evaluated	<ul style="list-style-type: none"> • Moderate visual performance 	<ul style="list-style-type: none"> • Recent upgrade of fence 	<ul style="list-style-type: none"> • No facilities 	<ul style="list-style-type: none"> • Direct access off Mountain Drive 	<ul style="list-style-type: none"> • Cemetery full

SECTION 4 : BURIAL TARIFF ANALYSIS

Table 4 illustrates the various burial tariffs for Adult, Private and Public; Category A and B Residents in the Drakenstein and surrounding Municipal areas.

Table 14 : COMPARISON OF BURIAL COSTS

MUNICIPALITY	BURIALS			GRAVE SITES	TOTAL (WEEK DAYS)
	Weekday	Saturday	Sunday		
Drakenstein	311-00	347-00	555-00	232-00	543-00
City of Cape Town (A)(P)	1240-00	1240-00	-	-	1240-00
City of Cape Town (B)(P)	450-00	450-00	-	-	450-00
City of Cape Town(A)(Pb)	490-00	490-00	-	-	490-00
City of Cape Town(B)(Pb)	400-00	400-00	-	-	400-00
Stellenbosch	330-00	-	-	530-00	860-00
Theewaterskloof	-	-	-	*145-00	145-00
Swartland	150-00	150-00	-	250-00	400-00
Breede Vallei (Worcester)	830-00	950-00		300-00	1130-00

*excludes grave digging

Source: Municipal Cemetery Departments (2005)

NOTES:

(i) SATURDAY AND SUNDAY BURIAL SURCHARGES

- DRAKENSTEIN
 - Saturday : R347-00
 - Sunday : R555-00
- CITY OF CAPE TOWN: No Saturday Surcharge, No Sunday Burials (except children)
- STELLENBOSCH: Saturday Surcharge : R600-00
- BREEDE VALLEI: Saturday R950-00 for residents, R1180-00 for non-residents

(ii) RESIDENT vs NON-RESIDENT

- DRAKENSTEIN, double tariff (i.e. plus 100%)
- CITY OF CAPE TOWN, plus 100% tariff
- BREEDE VALLEI, Weekday: R1060-00, Sat/Sun R1180-00
Grave sites : R530-00

(iii) MUSLIM BURIAL

- CITY OF CAPE TOWN
Category A : R625-00; Category B : R280-00

(iv) NICHES

- DRAKENSTEIN
Inside municipal area R238-00,
Outside municipal area R744-00
- CITY OF CAPE TOWN
R525-00 to R1270-00 (Niches)
R325-00 (Memorial Walls)

SECTION 5 : PARYS CEMETERY; POTENTIAL GRAVE INFILL

Table 15 illustrates the extent of potential grave development within vacant portions of the various denominational sections within Parys Cemetery.

TABLE 15 :PARYS CEMETERY : VACANT AND POTENTIAL INFILL

DENOMINATION	POTENTIAL VACANT / INFILL GRAVES
NG	12
ALGEMEEN	180
CHRISTIAN BROS	45
PPK	5
SEVENTH DAY ADV:	
- White	6
- Non-White	6
OU SEKTARIES	11
BETEL	50
ROMAN CATHOLIC:	
- White	130
- Non-White	84
CONGREGATIONAL	20
REFORMED	240
LUTHERAN	80
AGS:	
- White	510
- Non-White	240
ST STEPHENS	140
AME	120
HOLY TRINITY:	
- White	120
- Non-White	140
MUSLIM	(1000)
JEWISH	264
EMMANUEL	12
PORTION OF HERO'S ACRE	(1000)
TOTAL	2415 + (1000) + (1000) = 4415

Source: Setplan-DJ in-field survey (2005)

SECTION 6 : NEW CEMETERY SITE INVESTIGATION : METROPOLITAN

Figure 1 and Sections 1.1 – 1.6 detail sites which have been evaluated as potential new cemetery sites to serve the metropolitan component (Paarl-Wellington) of the Drakenstein municipal area.

These sites include:

- 1.1 Parys Site (Paarl)
- 1.2 Dal Josafat Site
- 1.3 Erf 16161
- 1.4 Vlakkeland Site
- 1.5 Champagne Site (Wellington)
- 1.6 Wellington Industria Site

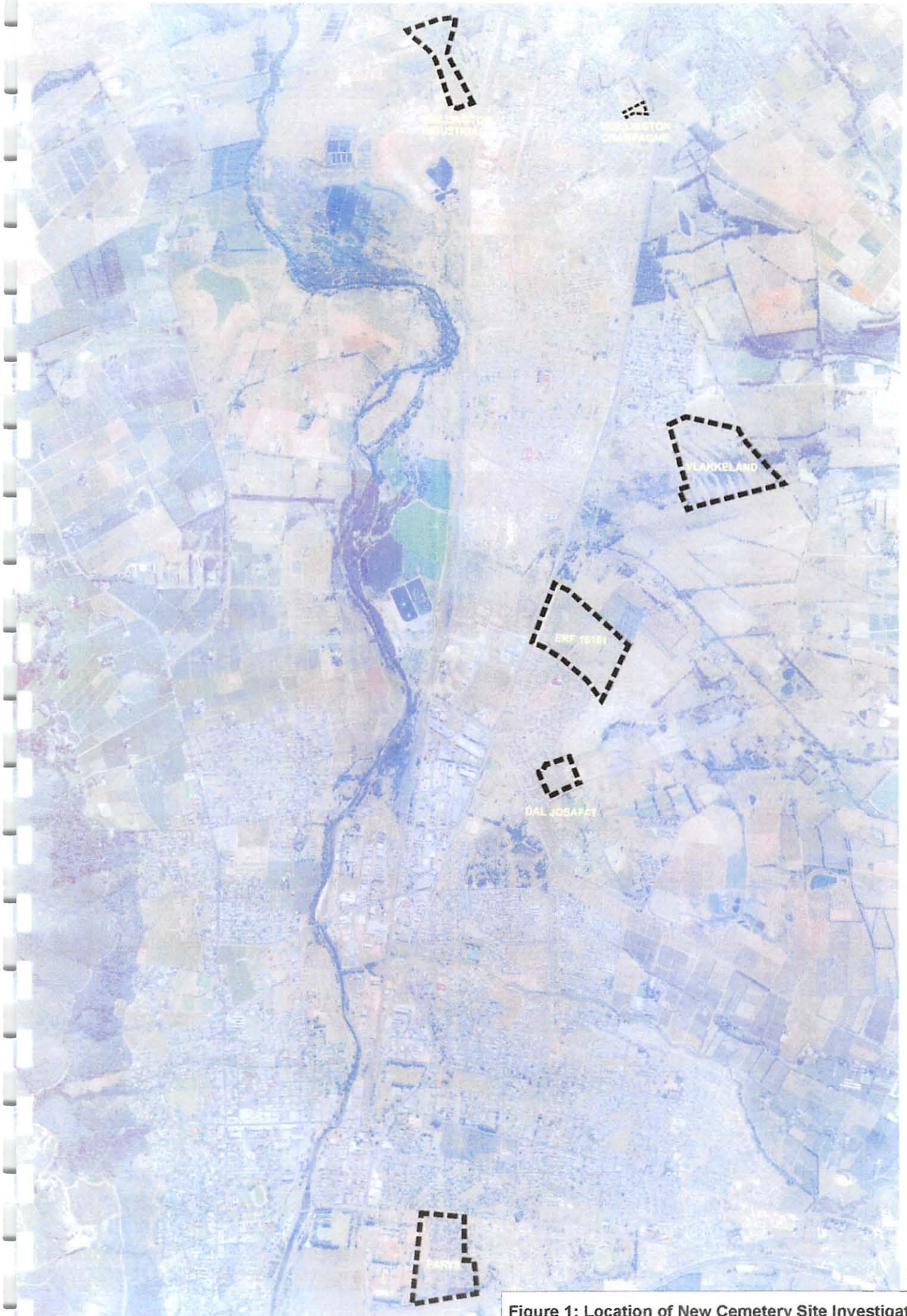


Figure 1: Location of New Cemetery Site Investigations

1. NEW CEMETERY SITE INVESTIGATION



1.3 ERF 16161



Erf 16161 (Trial Pit 5):
 - Zoning: Agricultural
 - Ownership: National Housing Board
 - Area: 37,5Ha
 - Urban Edge: Inside (see drawing)

Pit / Hole No.	TP 5
Position	Large open area
Terrain	gentle slope towards main road
Size of pit	1.0x3.0x1.8m

FIELD SURVEY TEST REPORT

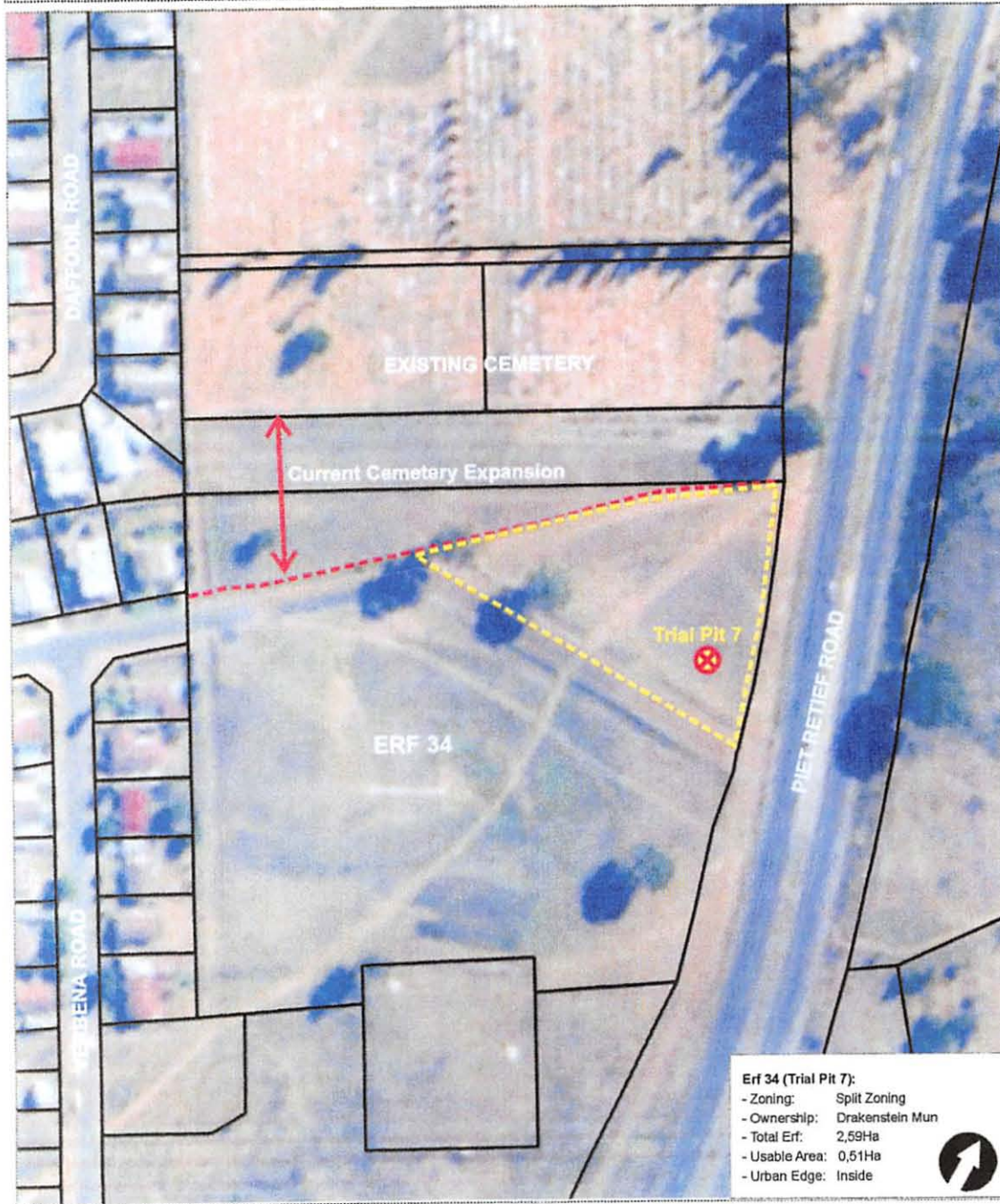
SOIL LEGEND	DEPTH	PROFILE DESCRIPTION
	0.00	Dry, brown & yellow, medium dense, silty sand & granite pebbles, hillwash?
	0.50	
	1.85+	Dry, red brown, firm to stiff, clay & granite pebbles, residual

NOTES

- 1) Hole stopped at 1.85m.
- 2) Pickable material up to 1,48m then progressively more difficult to pick
- 3) Water table not found

1. NEW CEMETERY SITE INVESTIGATION

1.5 WELLINGTON CHAMPAGNE SITE



Pit / Hole No.	TP 7
Position	near graveyard
Terrain	terraced : gentle slope
Size of pit	1.0x3.0x1.8m

FIELD SURVEY TEST REPORT

SOIL LEGEND	DEPTH	PROFILE DESCRIPTION
	0.00	Slightly moist, dark brown, medium dense, coarse silty sand & granite pebbles, hillwash?
	0.47	Moist, light brown, dense, silty sand & pebbles, hillwash?
	1.09	Wet, yellow, stiff, clay, residual
	1.83+	

NOTES

- 1) Hole stopped at 1.83m.
- 2) Pickable material up to 1,09m then progressively more difficult to pick
- 3) Water table not found

1. NEW CEMETERY SITE INVESTIGATION

1.6 WELLINGTON INDUSTRIAL SITE



Erf 34 (Trial Pit 8 & 9):
 - Zoning: Split Zoning
 - Ownership: Drakenstein Mun
 - Total Area: 14,5Ha
 - Usable Area: 5,29Ha
 - Urban Edge: Inside (see Drawing)

WELLINGTON INDUSTRIAL CEMETERY

Pit / Hole No.	TP WI 1
Position	Near SPCA
Terrain	Very grassy and bush area
Size of pit	1.0x3.0x1.8m

FIELD SURVEY TEST REPORT

SOIL LEGEND	DEPTH	PROFILE DESCRIPTION
	0.00	Slightly moist, brown, medium dense, sand & pebbles, hillwash?
	0.28	Moist, red brown, soft, clay & granite pebbles, residual
	1.8+	

NOTES

- Hole stopped at 1.80m.
- Pickable material up to 1,80m
- Water table not found

WELLINGTON INDUSTRIAL CEMETERY

Pit / Hole No.	TP WI 2
Position	
Terrain	flat even surface
Size of pit	1.0x3.0x1.8m

FIELD SURVEY TEST REPORT

SOIL LEGEND	DEPTH	PROFILE DESCRIPTION
	0.00	Slightly moist, brown, medium dense, coarse silty sand & granite pebbles, hillwash?
	0.30	Moist, yellow, firm, clay & granite pebbles, residual
	1.00	Moist, red yellow, stiff, clay, residual
	1.84+	

NOTES

- Hole stopped at 1.84m.
- Pickable material up to 1,00m then progressively more difficult to pick
- Water table not found

SECTION 7 : NEW CEMETERY SITE INVESTIGATION : RURAL TOWNS

Sections 2.1 – 2.4 detail sites which have been investigated as potential new cemetery sites to serve the rural towns within the Drakenstein Municipal Area.

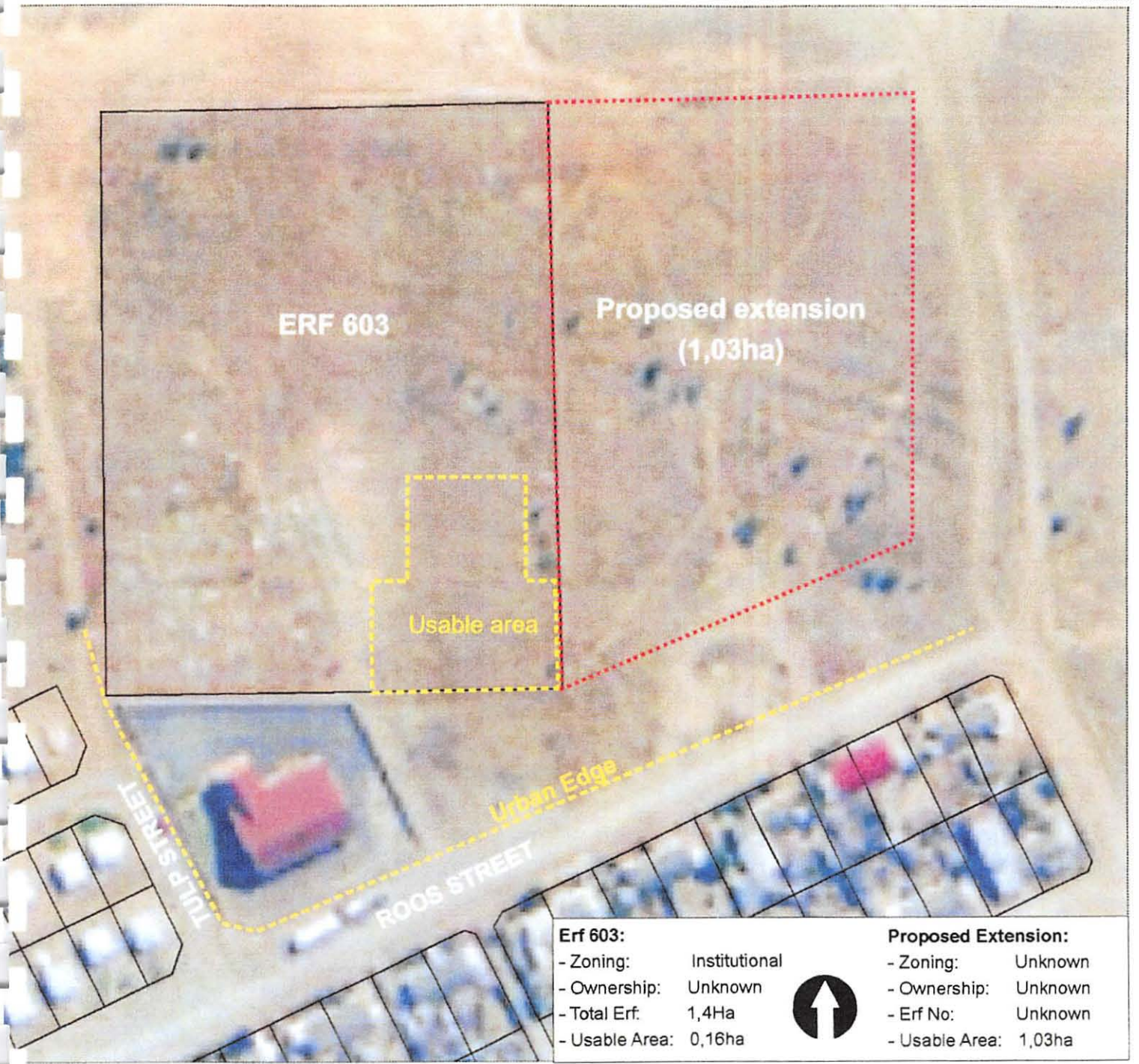
2. NEW CEMETERY SITE INVESTIGATION (RURAL TOWNS)

2.1a GOUDA Cemeteries Locality



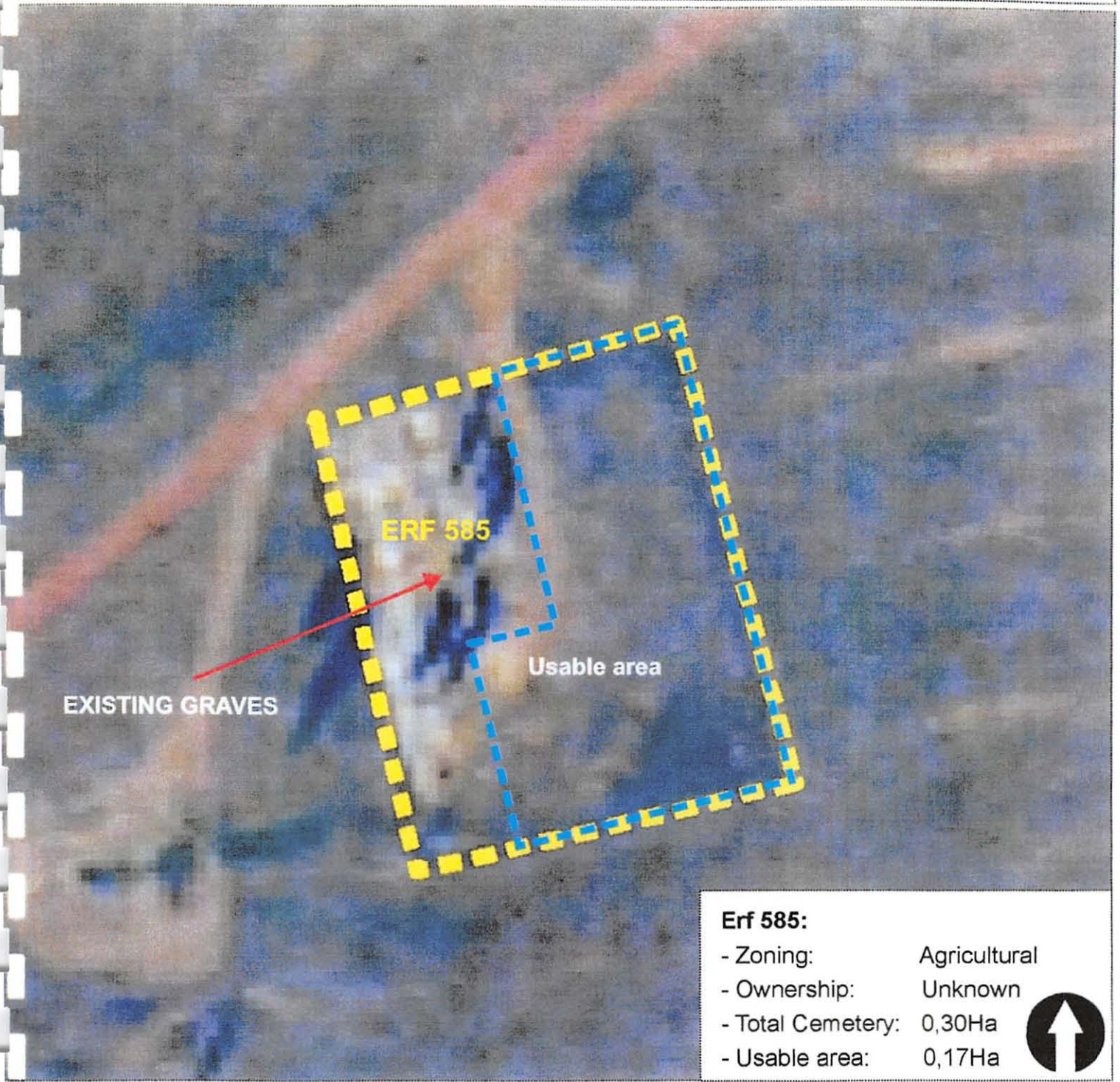
2. NEW CEMETERY SITE INVESTIGATION (RURAL TOWNS)

2.1b GOUDA (ERF 603) SITE



NEW CEMETERY SITE INVESTIGATION (RURAL TOWNS)

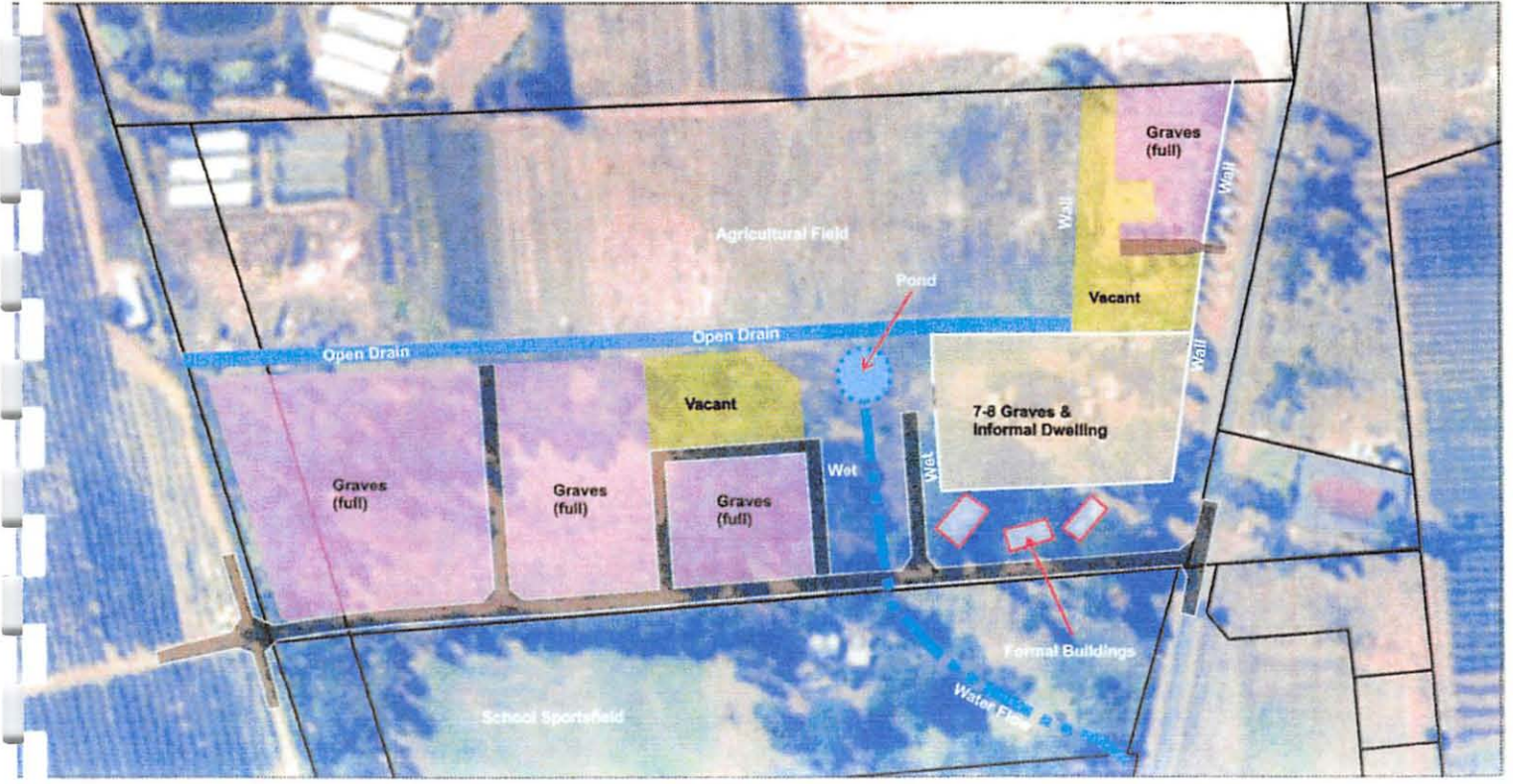
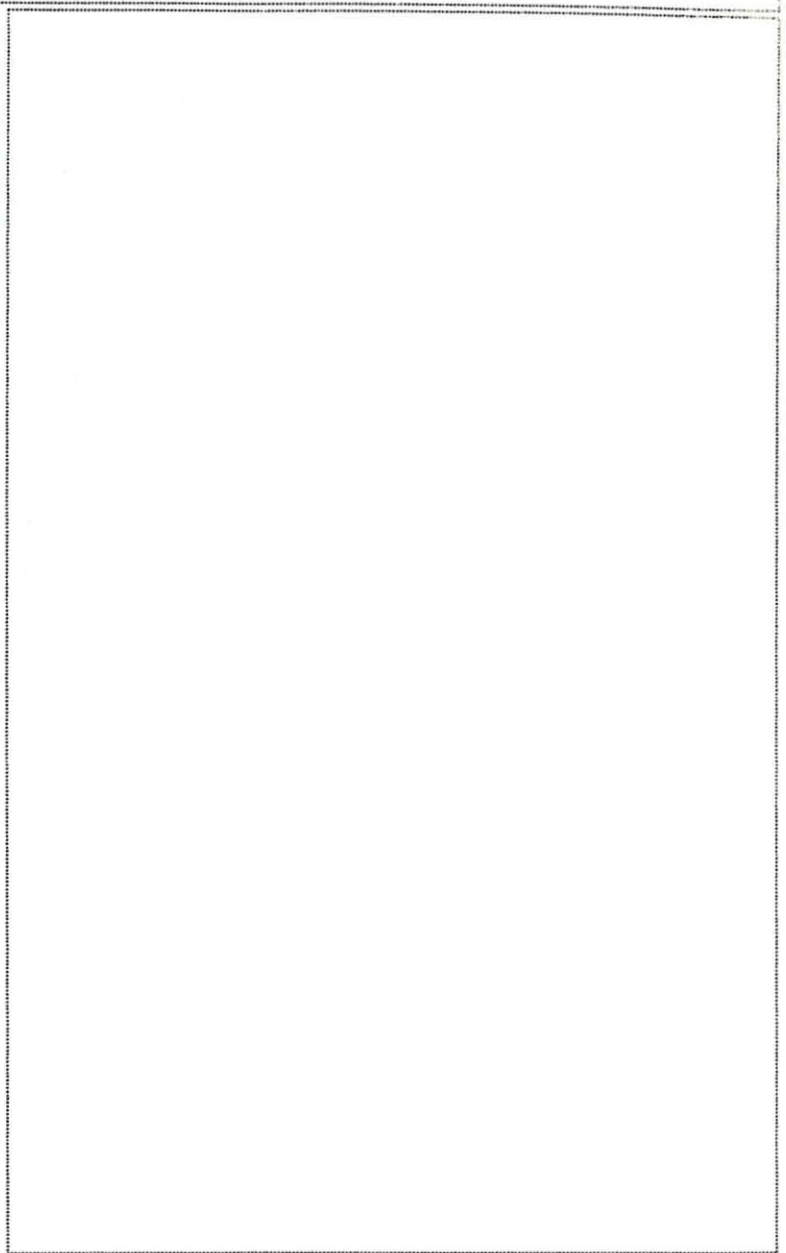
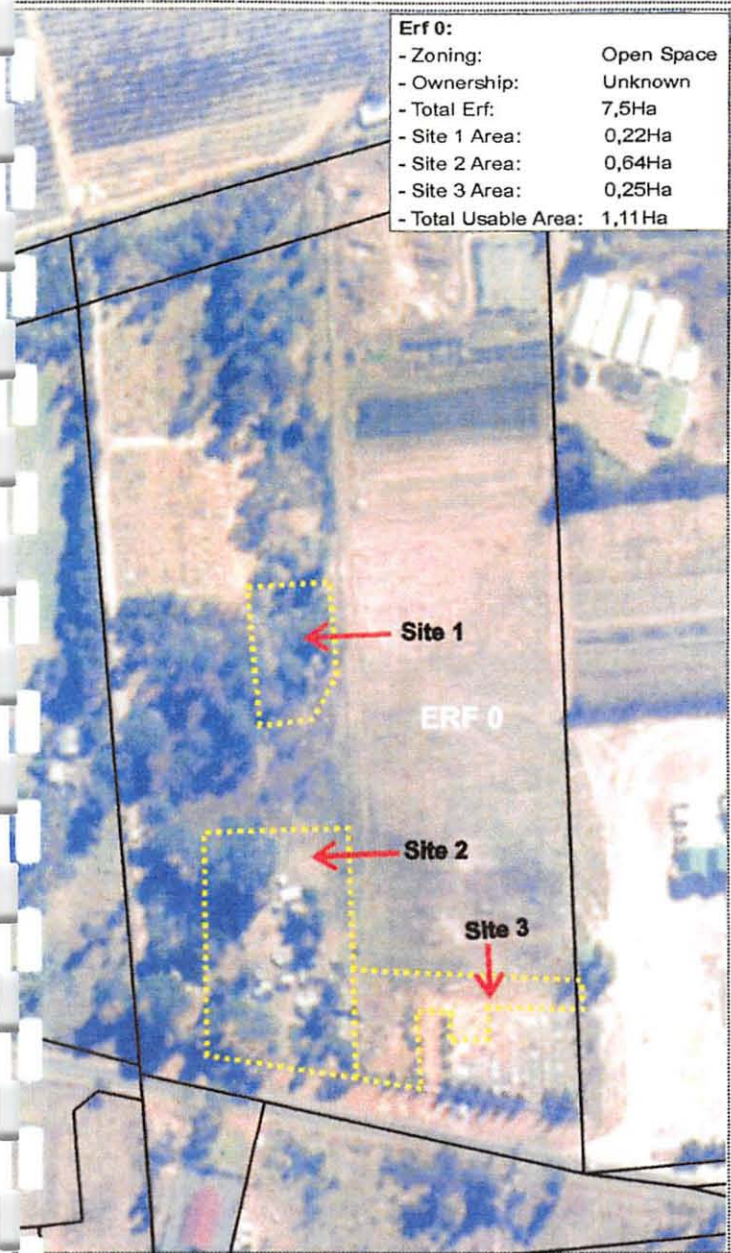
2.1C GOUDA ERF 585 CEMETERY



2. NEW CEMETERY SITE INVESTIGATION (RURAL TOWNS)

2.2 SIMONDIUM SITE

Erf 0:	
- Zoning:	Open Space
- Ownership:	Unknown
- Total Erf:	7,5Ha
- Site 1 Area:	0,22Ha
- Site 2 Area:	0,64Ha
- Site 3 Area:	0,25Ha
- Total Usable Area:	1,11Ha



2. NEW CEMETERY SITE INVESTIGATION (RURAL TOWNS)

2.3 HERMON CEMETERY



Erf 0:
- Zoning: Open Space
- Ownership: Unknown
- Total Erf: 2,8Ha
- Total Cemetery: 1,72Ha
- Usable area: 1,48ha



2. NEW CEMETERY SITE INVESTIGATION (RURAL TOWNS)

2.4 SARON CEMETERY



SECTION 8 : EXISTING CEMETERIES; MANAGEMENT, MAINTENANCE AND INFRASTRUCTURE DEVELOPMENT REQUIREMENTS

The following management, maintenance and infrastructure development requirements are identified for each of the existing cemeteries.

Existing Cemetery	MANAGEMENT, MAINTENANCE AND INFRASTRUCTURE DEVELOPMENT REQUIREMENTS				
	Environmental	Maintenance	Facilities	Access	Space utilisation
(i) Parys Cemetery	<ul style="list-style-type: none"> • Implement alien plant control program • Implement solid waste control program (e.g. dumping) • When working in waterlogged working conditions during grave digging, burials and exhumations always pump to sewer • Cease all pump to ground activities 	<ul style="list-style-type: none"> • Repair damaged stormwater infrastructure • Implement stormwater infrastructure maintenance program • Repair and stabilize eroded areas and internal roads • Construct deep cut-off drain along eastern boundary, as well as at regular intervals within cemetery 	<ul style="list-style-type: none"> • Formalize Hero's Acre and Niche Wall area as cemetery focus, including detail planning, rationalization of Hero's Acre and development of infrastructure (e.g. pathways) • Introduce signage to improve visitor routing 	<ul style="list-style-type: none"> • Provide side drains along internal access roads 	<ul style="list-style-type: none"> • Conduct detail assessment of denominational areas and re-allocate grave space where required • Rationalize size of Hero's Acre to facilitate grave in-fill in residual area • Reserve portion of Hero's Acre for possible future mausoleum • Maximize short-term utilization of 4425 potential grave sites
(ii) Champagne Cemetery	<ul style="list-style-type: none"> • When working in waterlogged working conditions during grave digging, burials and exhumations always pump to sewer • Cease all pump to ground activities • Upgrade entrance 	<ul style="list-style-type: none"> • Regular maintenance of cut-off drains 	<ul style="list-style-type: none"> • Upgrade facilities to include ablution facilities for both workers and public • Increase size of storage facilities • Establish caretakers residence and office in new extension area 	<ul style="list-style-type: none"> • Provide side-drains along existing internal access roads • Explore access to new cemetery extension area via Bloekom Street, together with pedestrian access from existing 	<ul style="list-style-type: none"> • Plan expansion into adjoining undeveloped area (2,2ha 4 400 graves) and incorporate historic Huguenot cemetery and a memorial park in lower-lying area • Incorporate public

	<p>façade</p> <ul style="list-style-type: none"> Contain and direct stormwater to municipal network 			<p>parking area</p> <ul style="list-style-type: none"> Link existing cemetery with extension area (staff vehicles and pedestrian) 	<p>access over extension site via a dedicated pathway</p> <ul style="list-style-type: none"> Optimally utilize remaining vacant area (0,2ha or 400 graves) Rationalize existing Jewish section and re-allocate for Muslim burial, including appropriate grave design and orientation
(iii) Simondium Cemetery (general section)	<ul style="list-style-type: none"> Implement alien plant control program Implement solid waste control program Address informal settlement problem Formally demarcate cemetery and erect perimeter fence and gate Construct entrance façade with appropriate signage 	<ul style="list-style-type: none"> Formalise cemetery layout and implement maintenance program Regular maintenance of existing open drain along eastern edge of cemetery 	<ul style="list-style-type: none"> Construct new facilities including worker and public ablutions and worker store Formalize water drainage/course along southern boundary, with a detention pond prior to discharge into open drain 	<ul style="list-style-type: none"> Formalize (gravel) and maintain access road Incorporate pedestrian and vehicle access to adjacent dwellings, school and farm area Identify and develop a formal parking area 	<ul style="list-style-type: none"> Rationalize southern boundary abutting water course/flow area and maximize use of 0,22ha vacant area (\pm 440 graves) Investigate relocation of informal settlement, in order to release 0,64ha (1280 graves) site, incorporating existing 7-8 graves Investigate linkage of "general" and "NG" sections
(iv) Simondium Cemetery (NG Section)	<ul style="list-style-type: none"> Regular maintenance of open drain 	<ul style="list-style-type: none"> Regular maintenance program 	<ul style="list-style-type: none"> None required 	<ul style="list-style-type: none"> Current access and parking adequate 	<ul style="list-style-type: none"> Investigate linkage with "general" section Negotiate use of 0,25ha vacant area (500 graves) if

					required for "general" burials prior to grave release in informal settlement area
(v) Hermon Cemetery	<ul style="list-style-type: none"> Construct entrance façade Erect new perimeter fence and plant perimeter screening Install cut-off trench to depth of groundwater level 	<ul style="list-style-type: none"> Implement maintenance program including regular mowing and weed clearing 	<ul style="list-style-type: none"> Provide running water and ablutions for workers and public Provide shaded seating facility Construct cut-off trench along upper eastern boundary and midway across the site along the contour, with discharge to existing drain to river 	<ul style="list-style-type: none"> Construct central access road and parking area 	<ul style="list-style-type: none"> Demarcate cemetery site formally Divide cemetery into planned burial blocks Optimize use of existing vacant area for 2960 graves (1,48ha)
(vi) Gouda Cemetery (Old Apostolic Church)	<ul style="list-style-type: none"> Construct new entrance façade with appropriate signage to serve existing cemetery and extension Plant perimeter screening 	<ul style="list-style-type: none"> Implement maintenance program for entire cemetery 	<ul style="list-style-type: none"> Construct ablutions for both workers and public Construct a store 	<ul style="list-style-type: none"> Establish formal parking area with new entrance to serve both existing cemetery and proposed extension Install stormwater drainage in parking area Install all-weather access pathway into existing cemetery 	<ul style="list-style-type: none"> Optimize existing vacant area (0,16ha 320 graves) Initiate extension to the east to release ± 2000 graves (1,03ha)
(vii) Gouda Cemetery (municipal)	<ul style="list-style-type: none"> Construct entrance façade with appropriate signage Plant additional screening 	<ul style="list-style-type: none"> Regular maintenance program 	<ul style="list-style-type: none"> Additional facilities not required given low usage 	<ul style="list-style-type: none"> Current access and informal parking adequate given low usage 	<ul style="list-style-type: none"> Retain cemetery given infrastructure and available space (0,17ha) and potential graves (340 graves)

(viii) Saron Cemetery (municipal)	<ul style="list-style-type: none"> Construct entrance façade with appropriate signage at a safer location 	<ul style="list-style-type: none"> Regular maintenance program Ensure adequate irrigation of perimeter and internal screen planting 	<ul style="list-style-type: none"> Construct ablutions for both workers and public to compliment existing store which could be converted into an office Install cut-off drain along northern and eastern boundary, as well as along contour with the cemetery Construct stormwater channel within fenced-off area in southern portion 	<ul style="list-style-type: none"> Conduct new entrance/access road midway along northern boundary, with access off newly upgraded road Construct parking area within cemetery adjacent to central avenue Provide pedestrian access gates at north-western (existing entrance) and north-eastern boundaries 	<ul style="list-style-type: none"> Optimize existing vacant area (3,0ha) given potential of 6000 graves Reserve southern portion as open space given wet area (water course)
(ix) Dal Josafat	<ul style="list-style-type: none"> Improve perimeter screening for both purposes of wind abatement and visual screening 	<ul style="list-style-type: none"> Implement maintenance program, including building maintenance 	<ul style="list-style-type: none"> Retain existing buildings to serve proposed extension 	<ul style="list-style-type: none"> No additional access required given that existing access road can also serve the proposed extension 	<ul style="list-style-type: none"> Continue family and child burials Explore levelling of grave mounds together with erection of berm memorials to permit grassing and more cost effective maintenance Explore extension onto 2,5ha portion of Erf 16755 (5000 grave capacity)
(x) Voorstraat Cemetery	<ul style="list-style-type: none"> Construct new entrance façade with appropriate signage 	<ul style="list-style-type: none"> Continue with current maintenance program 	<ul style="list-style-type: none"> No facilities required given that cemetery is full/dormant 	<ul style="list-style-type: none"> No additional access given existing parking area and that cemetery is full/dormant 	<ul style="list-style-type: none"> Optimize residual area (10-15 graves) within Muslim denominational area Negotiate future Muslim burials at

					Champagne Cemetery <ul style="list-style-type: none"> • Retain cemetery for grave visitation
(xi) Bloekomlaan Cemetery	<ul style="list-style-type: none"> • Construct new entrance façade with appropriate signage • Construct suitable perimeter fence and entrance gate • Monitor vandalism and report incidents to police 	<ul style="list-style-type: none"> • Repair and maintain damaged infrastructure • Implement maintenance program 	<ul style="list-style-type: none"> • No additional infrastructure as cemetery is full/dormant 	<ul style="list-style-type: none"> • Construct fenced pedestrian route(s) along desire lines to facilitate/manage pedestrian movement through the cemetery 	<ul style="list-style-type: none"> • Retain cemetery for grave visitation
(xii) Mountain Drive Cemetery	<ul style="list-style-type: none"> • Install appropriate signage 	<ul style="list-style-type: none"> • Regular maintenance program 	<ul style="list-style-type: none"> • No additional facilities required given recent upgrading 	<ul style="list-style-type: none"> • Maintain access for visitation 	<ul style="list-style-type: none"> • Retain cemetery given visitation and possibility of re-burial (grave recycling) given Muslim custom

SECTION 9 : NEW CEMETERIES; MANAGEMENT, DESIGN AND INFRASTRUCTURE DEVELOPMENT REQUIREMENTS

The following management, design and infrastructure development requirements are put forward for the identified development phase for new cemeteries.

Development Phases	MANAGEMENT, DESIGN AND INFRASTRUCTURE DEVELOPMENT REQUIREMENTS					
	Geohydrological	Environmental	Maintenance	Facilities	Access	Space utilisation
Planning	<ul style="list-style-type: none"> • Conduct geotechnical investigation to identify ground water and excavation and grave stability informants • Employ sub-surface conditions to inform cemetery land use (e.g. shallower soil area suited for child graves or public/parking area) 	<ul style="list-style-type: none"> • Commission baseline specialist studies to determine environmental and heritage sensitivity of site (e.g. biodiversity and heritage assessments) • Complete and submit EIA Application Form and Scoping Checklist • Prepare Construction Environmental Management Plan (EMP) which addresses potential construction phase environmental 	<ul style="list-style-type: none"> • Design effective stormwater management system that discharges to surface water feature or municipal stormwater system, including reed beds to remove salts • Design cemetery layout to ensure that maintenance costs are minimised • Design landscaping and select planting to reduce maintenance and water use (e.g. indigenous) • Design landscaping with a focus on: <ul style="list-style-type: none"> - Planting on perimeter and in Civic Forecourt - Focal points and direction routing 	<ul style="list-style-type: none"> • Design ablutions according to principle of universal access (i.e. suitable for people with physical disabilities) • Design sewerage system to accommodate discharges from pumping activities during grave digging, burials and exhumations, as well as body washing (e.g. Muslim) • Ascertain facility requirements of cultural/faith groups (e.g. body washing) • Provide public 	<ul style="list-style-type: none"> • Conduct traffic impact assessment to determine optimum access point(s) and impact • Secure approval of traffic authority, including Provincial Roads Engineer (Main Roads) • Provide off-road hearse and family vehicle parking in burial blocks • Restrict public parking to an on-site dedicated parking area 	<ul style="list-style-type: none"> • Employ a functional cemetery design with a clear distinction between public forecourt (i.e. parking, public facilities) and burial blocks • Employ modular burial blocks given the following advantages: <ul style="list-style-type: none"> - Rectilinear shape - Orientation flexibility - Phased development - Grave type and denominational allocation • Incorporate Civic Forecourt, including: <ul style="list-style-type: none"> - Concentration of public and management buildings - Hero's Acre - Memorial park and niche walls - Public parking • Provide for grave options, including: <ul style="list-style-type: none"> - Monumental section - Berm section - Park landscape - Denominational section • Explore alternative interment options (e.g.

		<p>impacts</p> <ul style="list-style-type: none"> Obtain environmental and other relevant approvals (e.g. General Authorisation in terms of the NWA) 	<p>- Entrance façade and signage</p>	<p>facilities including shaded seating, drinking fountain and comfort room</p> <ul style="list-style-type: none"> Obtain building plan approval 		<p>mausoleum, grave recycling)</p> <ul style="list-style-type: none"> Secure land use approval, including rezoning, special consents and departures as required
Establishment	<ul style="list-style-type: none"> Stockpile removed topsoil for post-construction reinstatement 	<ul style="list-style-type: none"> Appoint Environmental Control Officer (ECO) to oversee EMP (if condition of approval) Clear site of all alien invasive plants Construct secure perimeter fence (palisade design with colouring to blend into surroundings is preferable) Design entrance façade to give cemetery identity and provide aesthetic quality Plant 	<ul style="list-style-type: none"> Formally demarcate cemetery layout with a view to minimizing maintenance costs Construct stormwater management system (if required) 	<ul style="list-style-type: none"> Construct facilities Engage public private partnerships and community-based contactors 	<ul style="list-style-type: none"> Construct access road, parking area, cemetery access roads (5,0m) and burial pathways (1,0m) 	<ul style="list-style-type: none"> Establish graves within different modular burial blocks (e.g. monumental) according to prescribed grave dimensions and orientation

		indigenous, water wise trees and shrubs along cemetery boundary to provide visual and wind screening				
Operational	<ul style="list-style-type: none"> • Monitor ground and surface water quality 	<ul style="list-style-type: none"> • Monitor alien plant growth and continue with alien plant control program • Pump to sewer when working in saturated conditions • Monitor environmental health conditions of cemetery staff 	<ul style="list-style-type: none"> • Maintain stormwater management system and other infrastructure • Maintain and regularly cut groundcover 	<ul style="list-style-type: none"> • Maintain facilities • Engage community groups as cemetery "guardians" (e.g. garden maintenance) • Engage cemetery-based contractors (general maintenance) 	<ul style="list-style-type: none"> • Maintain parking, roadways and pathways 	<ul style="list-style-type: none"> • Undertake land-use management and police illegal or non-conforming activities
Closure	<ul style="list-style-type: none"> • Monitor ground and surface water quality 	<ul style="list-style-type: none"> • Monitor alien plants and continue with alien plant control programme 	<ul style="list-style-type: none"> • Maintain vegetation and infrastructure 	<ul style="list-style-type: none"> • Maintain facilities 	<ul style="list-style-type: none"> • Maintain parking area, roads and pathways 	<ul style="list-style-type: none"> • Retain cemetery for visitation • Employ Civic Forecourt and buildings for community use (e.g. social services, clinic, civic gatherings)

SECTION 10 : LEGISLATION

The following legislation governs cemetery development and management.

10.1 ENVIRONMENTAL MANAGEMENT

There are four key Acts which set the regulatory framework for the environmental management of cemeteries and the establishment of new cemeteries. These are as follows:

- National Environmental Management Act (NEMA), Act 107 of 1999
- National Water Act, Act 36 of 1998
- National Heritage Resources Act, Act 25 of 1999
- Occupational Health and Safety Act, Act 85 of 1993

The following sections present an overview of this environmental regulatory framework.

(i) NEMA, Act 107 of 1999.

NEMA is intended to function as a framework act and other national legislation dealing with the environment are intended to be read in conjunction with NEMA and to supplement and complement it. NEMA provides 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 coordinating environmental functions exercised by organs of the State and to provide for matters connected therewith.

A recent amendment to NEMA is of particular relevance - the National Environmental Management Amendment Act, 8 of 2004, ("the second NEMA Amendment Act") reforms the Environmental Impact Assessment (EIA) regime. The amendments introduced by the second NEMA Amendment Act are designed to establish a better basis for the regulation of the environmental assessment of certain proposed activities and existing activities under NEMA in order to facilitate the bringing into operation of the new EIA regulations under NEMA which will replace the existing regulations made under the Environment Conservation Act. In terms of the Draft NEMA EIA Regulations (2004) the establishment of cemeteries have been listed in Schedule 3 as activities that may not be undertaken prior to the issuing of an environmental authorization by the competent authority and must at least be subjected to an initial environmental assessment.

Legal Requirements for Drakenstein Municipality

The Drakenstein Municipality is obliged, under Section 28, to take actions to prevent pollution or degradation of the environment. In accordance with Section 28 the Drakenstein Municipality should be informing and educating employees about the environmental risks of their work and ways of minimising these risks.

The listing of the establishment of cemeteries as activities that may not be undertaken prior to the issuing of an environmental authorization in the Draft Regulations (2004) indicates that the establishment of cemeteries will require environmental authorization upon the promulgation of the new NEMA EIA Regulations. In the interim period, the Drakenstein Municipality is advised to undertake an initial environmental assessment and submit an EIA Scoping Checklist to the provincial authority (DEA&DP) for their approval.

(ii) The National Water Act, Act 36 of 1998

Water use is controlled by the National Water Act (Act 36 of 1998). The enforcing authority is the Department of Water Affairs and Forestry (DWAF).

The National Water Act recognises that water is a scarce resource in South Africa and its provisions are aimed at achieving sustainable use of water for the benefit of all users. The provisions of the Act are thus aimed at discouraging pollution and waste of water resources.

In terms of the Act, water use has been specifically defined and can be broadly summarised as the abstraction, consumption and discharge of water¹. Use of water includes the discharge of water containing waste into a water resource. In terms of section 21 (g) a cemetery constitutes a water use. Unless authorised by a General Authorisation, a license is required to use water in this manner². This applies to all new cemeteries as all existing cemeteries are existing lawful water uses in terms of section 33 of the Act. As cooperative governance must be promoted in terms of sections 22(3) and 22(4), DWAF could dispense of the requirement for such authorizations if local authorities would take cognizance of the requirements of DWAF in their planning ordinances as far as these relate to the siting of cemeteries.

Chapter 3 of the National Water Act focuses on protection of water resources. Pollution prevention is covered in Part 4 (Section 19) of this chapter of the Act. Any person, who owns, controls, occupies or uses land, is deemed responsible for taking measures to prevent pollution of water resources. If these measures are not taken, the responsible authority may do whatever is necessary to prevent the pollution or remedy its effects and to recover all reasonable costs from the responsible person. Non-compliance with this provision constitutes a criminal offence.

Legal Requirements for Drakenstein Municipality

The establishment of new cemeteries requires authorization in terms of the National Water Act as this constitutes a water use. Very broad general authorizations are currently being prepared by DWAF for the purpose of such authorization.

Drakenstein Municipality, while operating cemeteries, has a responsibility to ensure that operations will not result in pollution of a water resource.

(iii) National Heritage Resources Act (Act 25 of 1999)

The protection and management of South Africa's heritage resources is controlled by the National Heritage Resources Act (Act 25 of 1999). The enforcing authority for this act is the South African National Heritage Resources Agency (SAHRA) and/or (in the Western Cape) Heritage Western Cape (HWC).

In terms of the Act, important cultural, historical, palaeontological and archaeological features such as graves, trees, Stone Age tools and the fossil beds of an area are protected. All war graves, freedom fighter graves are protected and any cemetery that is older than 60 years is considered a national monument. Given the historical, cultural or local community significance of many cemeteries they could be considered to be important cultural features and are therefore protected in terms of the Act and any alterations to cemeteries may require

¹ Section 21

² Section 22

approval in terms of the Act. Permits are required before graves can be exhumed (also see Exhumation Ordinance).

For developments that have a footprint greater than 5000 m² or involve the change of land use of a site that is greater than 10 000 m² the Act requires that the developer undertake a Phase 1 Heritage Study to determine whether any heritage resources of significant value may be impacted by the proposed development. Where the proposed development is subject to EIA approval (see NEMA) then the Act makes provision for the heritage study to be undertaken as part of the EIA.

Legal Requirements for Drakenstein Municipality

Any grave exhumations and alterations to existing cemeteries requires a permit from HWC and, in the case of cemeteries that are older than 60 years, requires a permit from SAHRA.

Any new cemetery that involves the alteration of a site of greater than 5000 m² or the change of land use of a site greater than 10 000 m² requires a Phase 1 Heritage Assessment. If an EIA is being undertaken then the assessment can be undertaken as part of the EIA process and authorized accordingly.

If while excavating a grave any archaeological or palaeontological or old graves are exposed then the Drakenstein Municipality must cease works and contact the appropriate heritage authority.

(iv) The Occupational Health and Safety Act (Act 85 of 1993)

Concerned with the protection of health and the safety of workers, especially in risk conditions. This Act is applicable to cemetery staff (e.g. grave diggers) who are exposed to health and safety risks.

10.2 CEMETERY ESTABLISHMENT AND MANAGEMENT

The legislative framework facilitating the development and management of cemeteries in the Drakenstein Municipal area, includes the following:

(i) Historical Background

Historically, the **Cemeteries Act No. 13 of 1883** facilitated the **establishment and management** of public cemeteries in the Cape Colony. In later years, the **Health Act, 1981 (Act 33 of 1981 as amended)**, provided a national directive through which the Minister of Health could make regulations in respect of cemetery standards and their establishment, as well as the storage, removal and transport of dead bodies. This responsibility was later (1989) transferred to the relevant provincial authorities.

(ii) Delegation of Cemetery Responsibility to Local Authorities

Currently, local authorities (e.g. Drakenstein Municipality) are **delegated cemetery responsibility** in terms of **Circular C/195 of 30 January 1995**. This circular, issued by the Department of Local Government and Planning of the Provincial Government of the Western Cape, assigned specific legislation and delegation of authority pertaining to cemetery development and management to local authorities. These included the following:

- i. Divisional Council Ordinance, 1976 (Ordinance 18 of 1976):
 - Section 164: Directive to establish cemeteries.
 - Section 165: Take over of cemeteries, and matters incidental thereto.
 - Section 168/1: Issuing of directive to close any cemetery or portion thereof.
- ii. Municipal Ordinance, 1974 (Ordinance 20 of 1974):
 - Section 163: Directive to establish cemeteries.
 - Section 164: Take over of cemeteries, and matters incidental thereto.
 - Section 167/1: Issuing of directive to close any cemetery or portion thereof.
- iii. Exhumations Ordinance, 1980 (Ordinance 12 of 1980):
 - Directive regarding exhumations / internments.

(iii) Exhumation Ordinance, 1980 (Ordinance 12 of 1980)

This Ordinance, administered by the Directorate Policy and Planning of the Department Health (Provincial Government Western Cape) focuses on the following:

- Prohibiting desecration / damaging of graves.
- Regulating exhumation, disturbance, removal, re-internment of bodies.

Within the Drakenstein municipal area, matters relating to exhumations / internments are delegated to Council, subject to final authorisation by the Department.

(iv) Land Use Planning Ordinance, 1985 (Ordinance 15 of 1985)

Currently LUPO regulates land use approval for cemeteries, including the following:

- The Ordinance provides a definition and zoning allocation (Open Space Zone II) for cemeteries, the zoning generally adopted in existing Section 8 municipal zoning regulations.
- It prescribes the application and approval process for land use change (e.g. zoning) to facilitate the cemetery land use authorisation.

(v) Provincial Zoning Scheme Model By Law (2002)

These model zoning scheme regulations, designated to replace the Section 8 regulations, make provision for the following:

- A specific cemetery zoning allocation; namely Open Space Zone 5: Cemetery, allowing for a primary use and consent uses.
- Definitions for both cemeteries and crematoria.
- Development / management provisions for cemeteries and crematoria.