



DRAFT BASIC ASSESSMENT REPORT

PROPOSED DEVELOPMENT OF THE NOOITGEDACHT
RETIREMENT ESTATE ON PORTIONS 11 & 12 OF THE FARM
NOOITDEDACHT 62 JU IN WHITE RIVER WITHIN THE
MBOMBELA LOCAL MUNICIPALITY, MPUMALANGA PROVINCE


October 2017

Prepared for: Nooitgedacht Lifestyle Trust

Prepared by: Enviroworks

Today's Impact | Tomorrow's Legacy

REPORT REVIEW AND QUALITY MANAGEMENT

	Final Report	Revision 1	Revision 2	Revision 3
Issue/Revision Name	Draft BA Report	Draft BA Report		
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Date:	24 May 2017	5 October 2017		
Signature:				

EXECUTIVE SUMMARY

The company Nooitgedacht Retirement Estate (Pty) Ltd intends to construct a retirement village on Portions 11 & 12 of the farm Nooitgedacht 62 JU (White River Extension 69) outside the town of White River, Mpumalanga Province. The proposed estate will constitute a retirement village and hospice development which would provide medical services and a variety of residential options. The total footprint area of the proposed estate will be approximately 11.86 ha.

The development will consist of 63 single residential stands. There are 7 types of house plans to choose from and will be sold as plot and plan. There will be 104 sectional title units consisting of one bedroom and two bedroom units. One of the sectional title blocks will be allocated to 34 assistant living units. One hectare of the property will be allocated for a medical clinic that will consist of consulting rooms with 72 Hospital beds.

Legislation:

The following listed activities as per GN R 327 and 325 have been identified and applied for accordingly:

Regulation	Activity	Description of trigger activity in proposed project
GN R 327 Listing Notice 1 (as amended)	Activity 12 The development of – (ii) infrastructure or structures with a physical footprint of 100 square metres or more where such development occurs – (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse	The proposed development's southern boundary will occur in some instances within 32m from the edge a watercourse
GN. R. 327 Listing Notice 1 (as amended)	Activity 27 The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation	The maximum area size of the footprint of the proposed development will be 9 ha. Natural, indigenous vegetation will have to be cleared on the proposed development footprint due to construction requirements.
GN. R. 327 Listing Notice 1 (as amended)	Activity 30 Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).	The footprint of the proposed area falls within a national threatened ecosystem listed as vulnerable.

Regulation	Activity	Description of trigger activity in proposed project
<p>GN. R.325 Listing Notice 1 (as amended)</p>	<p>Activity 6</p> <p>The development of resorts, lodges, hotels, tourism or hospitality facilities that sleeps 15 people or more.</p> <p>(hh) Areas within a watercourse or wetland, or within 100 metres of a watercourse or wetland</p>	<p>The proposed development fall within 100 metres of a watercourse.</p>
<p>GN. R. 325 Listing Notice 1 (as amended)</p>	<p>Activity 12:</p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>The footprint of the proposed area falls within a national threatened ecosystem listed as vulnerable. The proposed development will also result in the clearance of an area of 300 square metres or more of indigenous vegetation.</p>

Specialist Studies:

Ecological Assessment:

The study area consists of the transitional ecotone from grassland to bushveld on the foothills of the northeastern escarpment. The most serious transformation of the natural environment is as result of afforestation, agriculture and residential settlements and associated infrastructure. The regional ecosystem type is classified as Legogote Sour Bushveld. This ecosystem is not well protected (1% formally protected) and already 50% is transformed and as such is rated as Endangered (having lost more than 40% of its original extent) according to the National Spatial Biodiversity Assessment. The Mpumalanga Department of Environment’s Intrinsic Biodiversity Conservation Plan (MBC-plan) and LN3 ratings for the biodiversity significance of the study site are:

- Terrestrial biodiversity maintenance: No natural habitat remaining
- Aquatic ecosystem maintenance: Ecosystem maintenance
- LN 3 Priority Area: Critical biodiversity area

One of the objectives of the report is to verify these ratings and to provide detailed information regarding the site status. The site is located on the north-eastern edge of White River, directly to the north of the White River in an area consisting of small holdings and small farm portions. The site slopes slightly from north to south and the gradient becomes much steeper towards the valley bottom of the river. The river is perennial and the water quality is apparently seriously polluted by sewage from an unknown source. No wetlands were identified. Manmade features on the site include dwelling houses, ruins of dwellings, dirt roads / tracks and unused irrigation canal. The site is heavily invaded by weeds and invasive alien vegetation and can be described as being derelict and unused. One RDL species (*Aloe simii*) and one important endemic (*Gladiolus densiflorus*) was recorded.

The results of the biodiversity investigation indicate that the larger site area is fragmented and under severe pressure from human induced impacts. The sensitivity zoning (based upon natural integrity, fauna potential and ecological functions) for the different ecological communities are summarized as follows:

Vegetation Community	Sensitivity Rating
Fragmented & degraded grassland	Medium
Riparian zone	High
Transformed land	Low

As result of the historic and present negative impacts on the site the sensitivity ratings as determined by the present survey recommends that specific areas that is rated as *Critical Biodiversity Areas* by the LN3 map are in fact fragmented and degraded. The habitat delineation corresponds largely with the MBC Plan for the site of *no natural habitat remaining*.

The major anticipated impact on biodiversity is the loss and fragmentation of habitat which means the loss of living space (habitat) for animals and natural vegetation alike. The consequences of these impacts are in fact already progressing on the site. The ecological integrity and functions of the natural grassland and its ecology is presently degraded and fragmented to such an extent that it will need an intensive rehabilitation and conservation process to improve the present status. This will be highly unlikely and it can be assumed that the present impacts will eventually degrade the site to such an extent that it will have little or no value for the maintenance of biodiversity.

If the site is authorized for development it is important that mitigation measures are in place to ensure that important biota is not lost from the development area. Therefore, the planning phase must adopt a conservation minded approach with the objective being to provide sufficient area for the conservation of important biota and providing an ecological corridor and refuge alongside the river. This can be achieved by conserving the riparian zone and protecting it with at least a 30m buffer. This will ensure that the least fragmented grassland is conserved and will provide an open space where plants can be relocated to from the areas that are affected by construction. The site can be considered for development, given that the following recommendations and mitigation measures are followed:

Riparian Zone

- This area is of High biodiversity significance and must be conserved.
- A buffer zone as proposed is recommended to mitigate impacts on the riparian area. This buffer zone will conserve the least degraded fragments of grassland as well as the riparian area.
- Prevent untreated sewage from entering the river.
- Storm water discharge must not be directly into the river but must be planned to spread over the grassland zone before the wetland is reached.

Fragmented & degraded grassland

- This area is of *Medium* biodiversity significance and special mitigation measures must be followed before development can commence:
 - The affected area must be searched before construction during the summer season by specialists in order to identify and relocate important and rare fauna & flora.

General recommendations

Additionally, the following measures must be included with the management plan:

- Retain large indigenous trees on site where possible.
- Use only indigenous flora for landscaping.
- Implement an alien invader vegetation control program.
- Individuals must be prevented from cultivate crop gardens in the riparian zone. ,

Aloe Simii Ecological Assessment:

A small, isolated population of the Red Data Listed critically endangered plant species *Aloe simii* is located in the north-western portion of the proposed study area directly adjacent to the south of the existing homestead on site. Twenty one (21) individuals were positively identified during the site visit.

The micro-habitat within which the population is situated is in a highly degraded and ecologically unstable state. The majority of the individuals of the population are not in a desired healthy and thriving condition but rather seem to be struggling for subsistence due to the deteriorated condition of their micro-habitat. Due to the state of the micro-habitat a passive conservational approach by simply removing significant anthropogenic impacts will unfortunately not succeed in adequately improving the condition of the micro-habitat. Significant active intervention is required and will have to be implemented in order to improve the current habitat condition. This will be the most suitable way in which the continued survival and hopefully successful reproduction of the *Aloe simii* population can be ensured.

A minimum 30 m buffer zone is proposed to be implemented around the western, southern and eastern boundaries of population's distribution extent and an extended 70 m – 80 m buffer zone around the northern boundary of their distribution extent. The natural surface water drainage which occurs from the north-eastern portion of the site needs to be maintained as far as possible to continue providing the current surface water runoff conditions required by the population. For this reason the proposed buffer zone is extended in that direction to between 70 m and 80 m. The proposed buffer area will be approximately 1.3 ha in surface size which should prove sufficient in allowing for remaining natural ecological processes to continue once rehabilitation and habitat restoration has occurred and to enable pollinators such as sunbirds to readily visit the area during flowering season. This should subsequently ensure the sustainability of the population. The design of the proposed retirement estate will then accommodate and be developed outside the buffer zone.

A habitat rehabilitation, restoration and maintenance plan must be implemented in order to gradually and continually improve the ecological condition and functionality of the micro-habitat. This rehabilitation plan is discussed in detail under heading 8.2 of the report.

The southern boundary of the proposed development footprint is situated in close proximity to the identified 1:100 year flood line of the White River. A buffer recommendation to prevent development inside the 1:100 year flood line is required for the proposed estate. It is important for the entire riparian zone to be preserved as a faunal corridor while the degraded transitional grassland zone would not necessarily play such a significant role in faunal movement. A portion of the transitional zone should however also form part of the riparian buffer in order to widen the corridor and protect the riparian zone from impact of possible ecological 'edge effects'. A 2 m buffer outside the identified 1:100 year flood line will provide a riparian corridor area of suitable width which should prove sufficient for achieving the objective of adequate faunal movement and riparian zone preservation.

The main impacts associated with the proposed development are as follow:

☒ Destruction of the population of the critically endangered species *Aloe simii*

- Destruction/damage to the micro-habitat of the *Aloe simii* population
- Prevention/deterrence of pollinators to visit the *Aloe simii* population for pollination
- Impeding of the natural surface water catchment and drainage area
- Continued deterioration of the condition of the micro-habitat or individuals of the population

All these impacts are significant and rate between medium-high and very high. The implementation of the proposed mitigation measures, which include the access restricted buffer zone establishment and rehabilitation, habitat restoration and maintenance interventions, will however significantly reduce the risk of all impacts to acceptable and even positive levels.

The implementation of the approximately 1.3 ha access restricted buffer zone along with the adequate rehabilitation and restoration of the micro-habitat within which the identified *Aloe simii* population is located will contribute positively in a significant manner towards the ensured sustainability and subsistence of the population. Ecological functionality and services of the micro-habitat will be maintained and in fact improved through the buffer zone and rehabilitation measures which will improve the likelihood of the subsistence and ultimately envisaged thriving of the *Aloe simii* population.

Mitigation, management and monitoring measures as recommended in this document must be strictly adhered to and implemented during the construction as well as operational phases. This must be strictly regulated by the appointment of a suitably qualified and experienced independent Environmental Compliance Officer (ECO) who must conduct frequent environmental audits during the construction and rehabilitation phases.

Heritage Impact Assessment:

It is therefore the opinion of the specialist that this proposed development may continue in the event that all mitigation measures and recommendations as per this report are adhered to as well as all necessary authorisations and permits are successfully obtained.

A Phase 1 Heritage Impact Assessment (HIA) regarding archaeological and other cultural heritage resources was conducted on the footprint for the proposed Nooitgedacht Retirement Village, on portion 11 and 12 of the farm Nooitgedacht 62JU. The property is located along the R40 between the town of White River and the Caster Bridge Complex, within an urban area. The size of the study area is 11ha.

The study area is situated on topographical map 1:50 000, 2531AC, WITRIVIER, which is in the Mpumalanga Province. This area falls under the jurisdiction of the Mbombela Local Municipality, and the Ehlanzeni District Municipality.

The National Heritage Resources Act, no 25 (1999)(NHRA), protects all heritage resources, which are classified as national estate. The NHRA stipulates that any person who intends to undertake a development, is subjected to the provisions of the Act.

The area for the proposed development (11ha) is currently vacant land that extends down to the White River in the south. Historical Google Earth imagery (2004 / 2013) shows that most of the study area is situated on transformed agricultural lands. The area comprises largely of alien vegetation with small sections of indigenous bush.

A small graveyard was identified to the north-east of the study area. Mitigation measures are proposed. The survey revealed no other archaeological or historical features in the study area. Some ruins, an old bridge and road were identified during the survey but they are not older than 60 years and are of no significance. No archaeological material or features with heritage value were identified during the survey.

Environmental Impact Statement

The key findings of the Basic Assessment phase can be summarised as follows:

Based on the survey and the findings in this report, Adansonia Heritage Consultants states that there are no compelling reasons which may prevent the proposed development to continue if the mitigation measures for the small graveyard are adhered to.

After careful consideration of the findings and outcomes during the BA phase, Enviroworks is of the opinion that the development of the proposed retirement estate can be undertaken without unacceptable or unmanageably significant negative impacts or fatal flaws on the environment, should the prescribed mitigation measures be adequately implemented. Based on all information that was captured in this report, the proposed development will not lead to unacceptable impacts or fatal flaws and should be considered plausible in the framework of NEMA. The majority of the anticipated impacts have low to medium ratings while the impacts determined to have medium-high to high ratings (impacts on the *Aloe simiii* population and White River) can be suitably reduced to within acceptable levels by the implementation of the mitigation and management measures identified and recommended by the specialists.

An Environmental Control Officer (ECO) must be appointed by the applicant/developer to actively assist and undertake environmental compliance audits to ensure that the construction phase of the development is

acceptably implemented in an environmentally responsible and sustainable manner in accordance with the recommendations of the EMPr. The ECO must also ensure compliance with the conditions of approval in the EA to be issued by the competent authority.

The results of the appointed ECO's audits should be used to inform an Environmental Close-out Audit Report, which should be submitted to the competent authority at the end of the construction phase.

The Receiving Environment

Due to the already disturbed and degraded condition of the *Aloe simii* population micro-habitat associated with the proposed project area, the development along with the proposed environmental management recommendations will in fact improve the environmental state of the area and subsequently assist with the persistence of the *Aloe simii* population on site.

Public Participation

To support public interest and BA process, a comprehensive public consultation process will occur throughout the duration of the assessment processes. A diverse mix of authorities, stakeholders and I & AP's will be consulted during this time, representing the environment, social, economic and political sectors of local, regional and provincial bodies.

This BA process has adequately assessed the potential impacts associated with the proposed development and has determined, based on the outcomes of a multitude of contributing information, that the proposed development would not result in any unacceptable environmental impacts or fatal flaws and as such may be authorised.

The project phase within which this report falls is the Draft Basic Assessment Report, which was coupled with it a 30 day PPP comment period. All stakeholders and registered I & AP's will be informed of the commencement of the PPP via email. Site notices will be put up at various public locations within the area and hardcopies of the report will be made available at various public locations within the area.

The *Aloe Simii* Ecological Assessment was sent for comments to Mr Mervyn Lotter from MTPA for comments. The comments are included within Annexure C.

TABLE OF CONTENT

List of Figures.....	xii
List of Tables.....	xiii
Content of Appendices.....	xiv
Abbreviations	xv
Report layout.....	1
1. Introduction.....	2
1.1 Project applicant information	2
2. Environmental Assessment Practitioner.....	3
2.1 Details of the EAP	3
2.2 Expertise of the EAP Representative.....	3
2.3 Public Participation Officer.....	6
2.4 Details of the Internal Reviewers	7
3. Relevant Environmental Legislation and Guidelines	8
3.1 Constitution of the Republic of South Africa (Act 108 of 1996).....	8
3.2 Other relevant environmental legislation	8
3.2.1 National	8
3.2.2 Provincial	11
3.2.3 Local.....	11
3.3 Relevant Guidelines.....	12
3.4 NEMA Listed Activities Triggered by the Proposed Project.....	13
3.5 NEMA Regulation 23 EIA Report information compliance.....	14
4. Project Location and Description	19
4.1 Project Location.....	19
4.2 Project Description	3
4.3 Project services.....	3
4.3.1 Electricity Supply	3
4.3.2 Water supply and Sewage Management	3
4.3.3 Solid Waste Management	4
5. Needs and Desirability of the Project	5
6. Alternatives Considered	7
6.1 Location Alternatives.....	7
6.2 Design Layout Alternatives.....	7
6.3 No-Go Option	11

7. Description of the Environment	12
7.1 Bio-Physical Description	12
7.1.1 Climate.....	12
7.1.2 Geology and Soils.....	12
7.1.3 Topography.....	12
7.1.4 Ecological and Wetland Impact Assessment	12
Single striped mouse	25
Spotted-necked otter	25
Selous’ mongoose.....	25
7.1.5 <i>Aloe simii</i> Ecological Impact Assessment and Management.....	26
7.1.6 An adequate buffer distance required from the 1:100 year floodline of the White River	43
7.1.7 Heritage Impact Assessment	46
7.2 Socio-Economic Description	47
8. Public Participation Process	48
9. Environmental Impact Assessment	49
9.1 Methodology for Impact Assessment and Risk Rating.....	49
9.2 Description of Potential Impacts and their Recommended Mitigation Measures	51
9.2.1 Construction Phase.....	52
9.2.2 Operational Phase	56
9.2.3 Cumulative Impacts	59
9.3 Risk Ratings of Potential Impacts	59
9.3.1 Construction Phase.....	60
9.3.2 Operational Phase	83
9.4 Preferred Alternative Concluding Statement.....	98
10.Assumptions, Uncertainties and Gaps in Knowledge	99
11.Professional Opinion of the EAP and Environmental Impact Statement	101
11.1 Professional Opinion of the EAP.....	101
11.2 Environmental Impact Statement	101
12.Conclusion	101
13.References	103

LIST OF FIGURES

Figure 1: Locality map of the proposed development (see Appendix B for A3 size)	1
Figure 2: Image visually illustrating the general landscape of the proposed project area	1
Figure 3: Image visually illustrating the general landscape of the proposed project area	2
Figure 4: Image visually illustrating the general landscape of the proposed project area	2
Figure 5: Preferred Alternative for the proposed development (see Appendix B for A3 size)	9
Figure 6: Second Alternative for the proposed development (see Appendix B for A3 size).....	10
Figure 7: Vegetation map of the proposed development (see Appendix B for A3 size)	14
Figure 8: Ecological and Heritage sensitivity map of the proposed development (see Appendix B for A3 size)	15
Figure 9: Distribution map indicating the extent of the distribution of the individuals of the <i>Aloe simii</i> population (see Appendix B for A 3 size).....	27
Figure 10: Highly degraded and fragmented condition of the micro-habitat of the <i>Aloe simii</i> population	29
Figure 11: Buffer map indicting the proposed buffer area to be implemented around the <i>Aloe simii</i> population (see Appendix B for A 3 size).....	32
Figure 12: Existing homestead footprint rehabilitation map indicating the required barricading, cut-off trench and runoff management berms layout (see Appendix B for A 3 size)	37
Figure 13: Rehabilitation map indicating the required area to be actively rehabilitated around the population location (see Appendix B for A 3 size)	40
Figure 14: Flood line Map indicating the proposed buffer outside the 1:100 year flood line of the White River (see Appendix B for A 3 size)	45

LIST OF TABLES

Table 1: Project applicant information.....	2
Table 2: Details of the EAP	3
Table 3: Applicable guideline documents.....	12
Table 4: Environmental Impact Assessment Regulations, 2014 listed activities triggered by the proposed project	13
Table 5: Information required in the BA Report as per Appendix 1 of GN R. 982 of the EIA Regulations, 2014 as amended on 7 April 2017.....	14
Table 6: Information of the farm portions associated with the proposed project	19
Table 7: Details of relevant land owner of Portions 11 & 12	1
Table 8: List of Specialist Studies Conducted	12
Table 9: National RDL species potential for the relevant quarter degree grid (2531DA)	18
Table 10: Invasive vegetation and weeds identified on site	19
Table 11: Important reptiles of the larger study area.....	21
Table 12: Red Data and Endemic birds that may be present in the study area. National Red Data listed birds according to Barnes (2000).	22
Table 13: Red Data listed mammals of the study area (Friedman & Daly, 2004)	24
Table 14: Scale utilised for the evaluation of the Environmental Risk Ratings	49
Table 15: Scale used for the evaluation of the Environmental Significance Ratings	51
Table 16: Environmental Risk and Significance Ratings for the Construction Phase	60
Table 17: Environmental Risk and Significance Ratings for the Operational Phase.....	83

CONTENT OF APPENDICES

Appendix A – CV's of the EAP and internal reviewer

Appendix B – Locality and Sensitivity maps

Appendix C – Public Participation Report

Appendix D – Declaration of EAP and applicant

Appendix E – Specialist Reports

Appendix F – Applicant information

Appendix G – Photo report

Appendix H – EMPr

Appendix I – Technical Drawings

Appendix J – Additional Information

ABBREVIATIONS

BA	Basic Assessment
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CEL	Cost Estimate Letter
CIA	Cumulative Impact Assessment
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
CPA	Communal Property Association
CRR	Comments and Responses Report
CSP	Concentrated Solar Power
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DENC	Department of Environment and Nature Conservation
DM	District Municipality
DMR	Department of Mineral Resources
DoE	Department of Energy
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
FSR	Final Scoping Report
Ha	Hectares
HTF	Heat Transfer Fluid
I & AP's	Interested and Affected Parties
IBA	Important Bird and Biodiversity Areas
IDP	Integrated Development Plan
IPP	Independent Power Producer
kV	Kilovolt
LED	Local Economic Development
LM	Local Municipality

LSA	Late Stone Age
MAP	Mean Annual Precipitation
MASL	Metres Above Sea Level
MLL	Minimum living level
MSA	Middle Stone Age
MVA	Megavolt ampere
MW	Megawatt
NCPSDF	Northern Cape Provincial Spatial Development Framework
NDP	National Development Plan
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008)
NFA	National Forests Act (Act 84 of 1998)
NHRA	National Heritage Resources Act (Act 25 of 1999)
NIP	National Infrastructure Plan
NWA	National Water Act (Act 36 of 1998)
PFS	Pre-feasibility Study
PPP	Public Participation Process
PUC	Point of Utility Connection
PoSEIA	Plan of Study for Environmental Impact Assessment
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework
SIA	Social Impact Assessment
SIP	Strategic Integrated Project
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change
VIA	Visual Impact Assessment
WRYCM	Water Resource Yield Computer Model
WULA	Water Use Licence Application

REPORT LAYOUT

The table below summarises the content layout of this report.

Chapter	Chapter Heading	Content Summary
1	Introduction	Provides a brief background/overview of the proposed project and the importance of agriculture in South Africa. It also briefly discusses the project alternatives and project applicant information
2	Environmental Assessment Practitioner	Provides details and expertise of the EAP undertaking this EIA process, as well as information on Public Participation officer and internal reviewer
3	Relevant Environmental Legislation and Guidelines	Briefly explains the environmental legislation applicable to the proposed project on a national, provincial and district/local level. It also provides an overview of the guideline documents that are relevant to this EIA process and discusses the listed activities applicable to this proposed project as per the NEMA: EIA Regulations, 2014.
4	Project location and description	Describes the project location, a detailed description of the proposed project, as well as the relevant site infrastructure and services.
5	Need and Desirability of the Project	Explains the need and desirability of the project in line with the associated local and provincial advantages.
6	Consideration of Alternatives	Describes those alternatives that have been considered (i.e. identified and investigated), and indicates which alternatives are deemed to be “feasible” and “reasonable”. Also provide a comparative assessment of the potential impacts (i.e. advantages and disadvantages).
7	Description of the Environment	Describes the biophysical, social, economic and cultural aspects of the existing environment.
8	Public Participation Process	Explains the public participation process that is being undertaken as part of this EIA process.
9	Assumptions, Uncertainties and Gaps in Knowledge	Provides the assumptions, uncertainties and gaps in knowledge associated with this EIA process.
10	Environmental Impact Assessment	Provides a summary of the environmental impacts identified during scoping, describes the project phases considered as part of this impact assessment, describes similar activities in the area (for cumulative assessment purposes), describes the impact assessment methodology applied, and assesses the potential impacts associated with the proposed project, without and with mitigation (including alternatives and cumulative impacts).
11	EAP’s Professional Opinion and Impact Assessment Statement	Provides the EAP’s professional opinion on this proposed project, an Environmental Impact Statement, as well as a conclusion.
12	Conclusion	Provides a final conclusion on the project
13	References	Lists all references referred to in this EIA Report

1. INTRODUCTION

Nooitgedacht Lifestyle Trust, the applicant, proposes the development of a Retirement Estate on approximately 12 ha (maximum) of Portions 11 & 12 of the Farm Nooitgedacht 62 JU (White River Extension 69), Mbombela Local Municipality, Mpumalanga Province. The proposed development will entail a retirement village and hospice development which will provide quality medical services as well as a variety of residential options.

The proposed site falls within the planned municipal expansion and infrastructure framework as defined by the Spatial Development Framework and hence no alternative viable site locations were identified and evaluated for the project. No alternative sites were thus considered for this development.

In accordance with the National Environmental Management Act (Act 107 of 1998); Environmental Impact Assessment Regulations of 2014, a Basic Assessment (BA) process is required for the proposed project in order to obtain the necessary environmental authorisation (EA) from the competent authority. An initial EA application (DEDET reference number: 1/3/1/16/ 1E-9) and Draft BA Report was submitted to the competent authority by the original Environmental Assessment Practitioner (EAP) during the year 2015. The application has however lapsed in the meantime and it is therefore necessary for the applicant to submit a new EA application and commence with a new BA process for the proposed development. The applicant has obtained consent from the current landowner for the conduction of the BA process on the property (see Appendix F).

Enviroworks has been appointed by the applicant to act as the new independent EAP to facilitate the entire EA application process and complete the BA process for the construction and operational phases of the proposed project.

This report aims to give context to the proposed development through providing a comprehensive description of the envisaged activities and relevant infrastructure; the identification of significant environmental impacts associated with the proposed project; identification of appropriate alternatives and mitigation measures for reduction of undesired impacts; and communication of results in a clear and concise manner to the competent authority and other relevant parties to allow for informed decision making.

1.1 PROJECT APPLICANT INFORMATION

Table 1: Project applicant information

Company/entity name:	Nooitgedacht Lifestyle Trust
Registration number:	IT000081/2017(MN) (see Appendix F for registration)
Physical address	1 Antwerp Road, Modderfontein, Johannesburg
Postal address:	Postnet suite 573, Private Bag X29, Gallo Manor 2052
Contact person:	Johann Carstens
Designation:	Project Director
Contact number:	011 258 8865/082 542 1109
E-mail address:	consult@loufrandini.co.za

2. ENVIRONMENTAL ASSESSMENT PRACTITIONER

2.1 DETAILS OF THE EAP

Enviroworks was appointed by Nooitgedacht Retirement Estate (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to conduct a Basic Assessment process for the proposed project.

Enviroworks was established in November 2002. Although the formal establishment of the company took place in 2002, it is backed by more than 70 years of collective professional service and experience in the environmental field. The qualifications, expertise and experience of our professional team form the backbone of the company's continued success.

The vision of Enviroworks is to provide excellent, cutting edge Environmental Management Solutions and Services, underpinned by a team of professional consultants together with our associated network of specialist partners and project managers. The company continuously engages existing and emerging legislation, guidelines and practices in order to ensure the execution of high quality and appropriate studies. Through an integration of skills and expertise, it is envisioned that Enviroworks will deliver exceptional, competitive services for task execution and to meet deliverables. Enviroworks through years of experience and industry presence assures the seamless execution and roll out of tasks to achieve projected results on time. Our past experience on estate development projects further benefits our understanding of the required and associated processes and the impacts thereof.

Table 2: Details of the EAP

Company/entity name:	Rikus Lamprecht (on behalf of Enviroworks)
Physical address:	5 Walter Sisulu Street; Universitas; Bloemfontein; 9301
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Contact person:	Rikus Lamprecht
Designation:	Senior Environmental Consultant
Contact number:	072 230 9598
E-mail address:	rikus@enviroworks.co.za
Qualifications:	BSc Botany & Zoology M.Env.Sci Ecological Remediation and Sustainable Utilisation

2.2 EXPERTISE OF THE EAP REPRESENTATIVE

Rikus Lamprecht was employed by Enviroworks in 2016 as a Senior Environmental Consultant. Rikus was previously employed by Fraser Alexander Tailings from 2011 to 2015 as an Environmental Contracts Manager where he was responsible for the technical and operational management of all Fraser Alexander Tailings' mining environmental rehabilitation work. He was responsible for all facets of project management as well as implementation of rehabilitation and environmental strategies by planning activities, organizing physical, financial and human resources, delegating task responsibilities, leading people, controlling risks and providing technical support.

Rikus holds a B.Sc Botany and Zoology as well as an M.Env.Sci Ecological Remediation and Sustainable Utilisation degree. His environmental management knowledge and practical experience as well as his enthusiasm, disciplined goal-driven mind-set and high personal standards ensures high quality outputs during the implementation and completion of any environmental projects.

Environmental Impact Assessment Experience

2016

- Management of the Environmental Authorisation and EIA processes of the proposed Meerkat Hydropower Facility development in the Orange River in the Northern Cape Province.
- Management of the Environmental Authorisation and EIA processes of the proposed N8 Realignment Project in the Free State Province.
- Compilation of the Environmental Impact Assessment Report for the proposed Carpediem 500 ha vineyard development in the Northern Cape
- Management of the 24G Environmental Authorisation and EIA processes of the Mooihoekdam Project in the Free State Province.
- Management of the Environmental Authorisation and EIA processes of the proposed Metsimatala CSP facility development in the Northern Cape Province.
- Management of the Environmental Authorisation and EIA processes of the proposed De Eelt 100 ha vineyard development in the Northern Cape Province.
- Technical review of three Scoping Reports on behalf of the Northern Free State Mineral Resources Stakeholders Forum, Free State Agriculture and VKB Agriculture for three applications for exploration rights for hydrocarbon exploration in the Free State Province.

Basic Assessment Experience

2016

- Management of the Environmental Authorisation and BA processes of the proposed Metsimatala transmission line development in the Northern Cape Province.

2017

- Management of the Environmental Authorisation and BA processes of the proposed Nooitgedacht Estate development in the Mpumalanga Province.
- Management of the Environmental Authorisation and BA processes of the proposed CENTLEC Harvard transmission line development in the Free State Province.

Experience as an Environmental Control Officer

2016

- Completed an environmental site audit as an Environmental Control Officer (ECO) for the upgrade and construction of bridges on the N14 highway between Upington and Kuruman, Northern Cape Province.
- Completed an environmental site audit as an Environmental Control Officer (ECO) for the Neotel Optic Fibre line development near Nelspruit, Mpumalanga Province.
- Completed an environmental site audit as an Environmental Control Officer (ECO) for the Selatile Moloi road development in Vrede, Free State Province.

2017

- Completed an environmental site audit as an Environmental Control Officer (ECO) for the SANRAL N8 road widening near Hopetown, Northern Cape Province.

Permits and licencing

2016

- Conducting of Waste License and Air Emissions License applications for the 24G process of Clinvet International (Pty) Ltd, Free State Province.
- Provincial and National flora permit applications for Carpediem 500 ha vineyard development near Upington, Northern cape Province.

2017

- Provincial and National flora permit applications for De Eelt 100 ha vineyard development near Prieska, Northern cape Province.

Specialist report completion

2016

- Completion of a specialist ecological study and report for the proposed Olifantshoek Bulk Water Supply development in the Northern Cape Province.
- Completion of two specialist ecological studies and reports for the proposed 10 ha N8 gravel quarries in the Free State Province.
- Completion of a specialist ecological study and report for the proposed De Eelt 100 ha vineyard development in the Northern Cape Province.
- Completion of a specialist wetland study and report for the Lafarge Lichtenburg cement production facility and quarry in the North West Province.
- Completion of a specialist ecological study and report for the proposed 12 ha Nooitgedacht Retirement Estate development near Nelspruit in the Mpumalanga Province.
- Completion of a specialist ecological study and report for the proposed Ventersburg Bulk Water Supply development in the Free State Province.

2017

- Completion of a specialist ecological study and report for the proposed Phethogo Consulting filling station development in the Free State Province.
- Completion of a specialist ecological study and report for the proposed CENTLEC Harvard transmission line development N8 gravel quarries in the Free State Province.
- Completion of a specialist ecological study and report for the proposed Zevenfontein filling station development in the Gauteng Province.
- Completion of a specialist ecological study and report for the proposed Olifantsvlei Curro School development in the Gauteng Province.
- Completion of a specialist ecological study and report for the proposed Babereki Agricultural development in the Northern Cape Province.
- Completion of a specialist ecological study and report for the proposed Eikenhof Curro School development in the Gauteng Province.
- Completion of a specialist ecological study and report for the proposed Norvalspont residential development in the Northern Cape Province.
- Completion of a specialist ecological study and report for the proposed Williston residential development in the Northern Cape Province.

- Completion of a specialist ecological study and report for the proposed Musgrave residential and commercial development in Bloemfontein Free State Province.

Training courses facilitated

2016

- Three Alien Invasive Species legislation, identification and management training courses conducted for SAFCOL in the Mpumalanga and Limpopo Provinces.

See Appendix A for Curriculum Vitae.

2.3 PUBLIC PARTICIPATION OFFICER

The entire Public Participation Process for the BA process was conducted and coordinated by Anton Ackerman.

Name of EAP	Education Qualifications	Professional affiliations	Experience
Anton Ackermann	BSc Environmental Geography; BSc Honours in Geography; and Masters in Environmental Management	International Assasination of Impact Assessment; and SAGIC: Alien and Invasive Species Registration	3 years

Basic Assessment Experience

- Basic Assessment for the proposed construction of a truck stop facility on the N8, lesotho border, Free State province
- Conducting Basic assessment process for the proposed construction and upgrade of the Ventersburg Bulk Water Supply.

Auditing Experience

- Environmental Performance Audit for Lafarge Olive Hill Quarry, Bloemfontein, Free State Province
- Environmental GAP audit for Meadow Meats Kokstad, KwaZulu Natal

Experience in Permits and Licencing

- Water Use License Application for 6 Boreholes on the farm Rooikraal 454, Free State Province.
- Water Use License Application- for one borehole Palmiet 585 Portion 4, Free State Province.
- Water Use License Application for Olive Hill Quarry, Bloemfontein, Free State Province.
- Section 38 Heritage Notification for the Neotel optic fibre cable route, Kathu, Northern Cape.
- Water Use License Application for the proposed Sandmine on Farm Khiba 71, Free State Province.
- Water Use License for the road pavement in Botshabelo and Thaba Nchu, Free State Province

Environmental Management Programme/Plan

- EMPr for the proposed construction of a truck stop facility on the N8, Lesotho border, Free State province.
- EMPr for Rooikraal Truckstop and other facilities on the farm Rooikraal 454.
- EMP for Meadow Meats Abattoirs in Kokstad, Wesselsbron and Vryheid.
- EMP for the construction and upgrade of the Ventersburg Bulk Water Supply.

Environmental Control Officer (ECO)

- The construction of the Cecilia Park power line, Bloemfontein, Free State Province.
- The construction of a sub-station, Bloemfontein, Free State Province.
- The construction of a road between Moratelle and Khaukwe, North West Province.
- The construction of the Olifantshoek pipeline and reservoir
- The widening of the bridge N 12, Hopetown, Northern Cape Province
- The upgrade and widening of the R61, Umtata, Northern Cape Province

Risk Assessment/ Pre-feasibility Studies

- Conducting a Risk Assessment for the proposed Neotel optic fibre cable route, Kathu, Northern Cape
- Conducting a Pre-feasibility study for the use of burrows pits for the N8 realignment.

Other Experience

- GIS mapping and technical support for various projects, including the drawing of locality, route and sensitivity maps.
- Public participation processes and assistance to several projects.

2.4 DETAILS OF THE INTERNAL REVIEWERS

Elbi Bredenkamp started her career as a case officer and served as an environmental specialist with the Department of Minerals and Energy gaining extensive knowledge of mining impact and attributing management mechanisms.

From 1997 to 2002 Elbi further developed her knowledge in the environmental field as a case officer working for the Department of Tourism, Environment and Economic Affairs, Free State (DTEEA-FS). Here Elbi was responsible for reviewing environmental impact assessments and developing administrative processes & organizational structures within the department. Through ongoing dealings with Environmental Legislation Elbi familiarized herself with the National Environment Management Act (Act 107 of 1998 “NEMA”) and NEMA EIA Regulations.

In 2002 Elbi established Enviroworks. As the Director of the company, Elbi gained extensive experience in the conducting of Environmental Impact Assessments, Risk Analysis, Auditing and Monitoring and Compiling of Environmental Management Plans for numerous projects. A familiarity with departmental mechanisms and functioning aided towards the success of these projects.

Designation: Company Director

Contact number: 082 562 4134

Email address: elbi@enviroworks.co.za

3. RELEVANT ENVIRONMENTAL LEGISLATION AND GUIDELINES

3.1 CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA (ACT 108 OF 1996)

Section 24 of the Constitution of South Africa provides the main national legislative obligation towards sustainable environmental management and development. This section forms the foundation of all other subsequent environmental legislation and governance in South Africa. Section 24 states the following:

every person shall have the right -

- (a) to an environment that is not harmful to their health nor well-being; and
- (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that -
 - (i) prevent pollution and ecological degradation;
 - (ii) promote conservation; and
 - (i) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”

The following sections provide an overview of the relevant environmental legislation and guideline documents applicable to the proposed project.

3.2 OTHER RELEVANT ENVIRONMENTAL LEGISLATION

Aside from NEMA, other key environmental legislation, policies, plans and guidelines will also be triggered by the proposed project, whilst others shall provide strategic goals and priorities for different resources and sectors.

The environmental legislation relevant to the proposed project and which has been taken into account in the preparation of the Final Scoping Report is summarised below:

3.2.1 National

3.2.1.1 National Environmental Management Act (Act 107 of 1998) (NEMA)

NEMA is the principle/framework legislation governing EIA and subsequent EA processes under the authority of the National Department of Environmental Affairs.

NEMA makes provisions for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment; institutions that will promote co-operative governance; procedures for co-ordinating environmental functions exercised by Organs of State and to provide for matters connected therewith.

Section 2 of the Act establishes a set of principles, which apply to the activities of all Organs of State that may significantly affect the environment. These include the following:

- Development must be sustainable;
- Pollution must be avoided or minimised and remedied;
- Waste must be avoided or minimised, reused or recycled;
- Negative impacts must be minimised and positive impacts enhanced; and

- Responsibility for the environmental health and safety consequences of a policy, project, product or service exists throughout its entire life cycle.

These principles are taken into consideration when a Governmental Department needs to exercise its powers for example, during the processes of granting permits or Environmental Authorisations or the enforcement of existing legislation or conditions of approval.

Section 23 of NEMA furthermore provides for general objectives of Integrated Environmental Management. In alignment with these objectives, the potential impacts on the biophysical and socio-economic environments are identified and evaluated. These potential environmental impacts have been assessed during the Scoping Report phase and mitigation measures are provided where relevant.

The subsequent Environmental Impact Assessment Regulations, 2014 (Government Notices R983, R984 and R985 in Government Gazette No. 38282 of 04 December 2014), which are also referred to as Listing Notices 1, 2 and 3 respectively, list development activities which will trigger the necessity to conduct either a Basic Assessment or a full Scoping & EIA process prior to EA being obtained for a proposed project. Listing notices 1 & 3 activities require only a Basic Assessment to be conducted while Listing notice 2 activities trigger the requirement for a full Scoping & EIA process to be conducted.

Considering the nature and scale of the development activities triggered by the proposed project, it was required that a Basic Assessment (BA) process be conducted to provide sufficient information to the competent authority in order for them to make an informed decision regarding the approval or rejection of the EA applied for.

Only once the EA is granted and the required supporting permits have been issued, may the applicant lawfully commence with the proposed project. The Basic Assessment (BA) process is therefore a critical component in the feasibility and planning stage of any proposed project.

3.2.1.2 National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA)

NEMBA aims to provide for the management and conservation of the country's rich biodiversity within the framework of NEMA. It aids in the protection of species and ecosystems which warrant national protection and provides for the sustainable usage of the country's indigenous biological resources.

NEMBA and its Regulations was therefore utilised for determining the ecological/biodiversity significance, value and subsequently the adequate management of the proposed project area with regards to ecosystems, habitats and individual species.

The Department of Environmental Affairs is responsible for the implementation and overseeing of this legislation along with the South African National Biodiversity Institute (SANBI).

3.2.1.3 National Forests Act (Act 84 of 1998) (NFA)

The aim of the NFA is to promote the sustainable usage, management and development of forests for the benefit of all in South Africa. The Act also makes special provisions for the protection of specific forests and tree species which duly require formal protection in order to ensure their prolonged existence.

The National Forests Act was therefore utilised to determine the potential presence of any protected forests or tree species in the proposed project area in order to ensure that the correct processes are followed for the approval of any listed activities for which a permit may be necessary regarding such forests or species, should it be required.

Permit applications in terms of the National Forests Act are lodged with the Department of Agriculture, Forestry and Fisheries.

3.2.1.4 Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA)

CARA aims to provide for the protection and control over utilisation of the country's agricultural resources in order to promote conservation of soils, water and natural vegetation as well as the combatting of weeds and invader plants. Sustainable utilisation is a key objective.

CARA was therefore used for determining the agricultural significance, value and subsequently the adequate management of the proposed project area.

It is overseen by The Department of Agriculture, Land Reform and Rural Development in the Northern Cape Province.

3.2.1.5 National Water Act (Act 36 of 1998) (NWA)

The NWA aims to ensure sustainable use of water through the protection of the quality of water resources for the benefit of all water users. Its principal focus is the rectification and equitable allocation and use of the scarce and disproportionately distributed water resources of South Africa.

Section 21 of NWA defines the types of water uses which require a Water Use License to be applied for. The Act stipulates that a Water Use License Application must be submitted if a development takes place within 500 m of a natural watercourse/wetland.

The Department of Water and Sanitation is responsible for the implementation and overseeing of this legislation and is also the responsible authority for the issuing of permits for water use.

3.2.1.6 National Heritage Resources Act (Act 25 of 1999) (NHRA)

The NHRA aims to provide for the integrated and interactive management and conservation of the national heritage resources in South Africa so that they may be bequeathed for future generations.

Section 38 lists categorised development processes which require the South African Heritage Resources Agency (SAHRA) to be notified and furnished with an archaeological and palaeontological study of a proposed project area in order to obtain project authorisation. The following development processes are triggered during the construction and operational phases of the proposed project:

- (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as -
 - (c) any development or other activity which will change the character of a site -
 - (i) exceeding 5 000m² in extent; or

The South African Heritage Resources Agency (SAHRA) has a mandate, in terms of the NHRA, to enforce the conditions of the NHRA, and hence oversees the management of heritage resources together with provincial heritage agencies.

3.2.1.7 National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA)

NEMWA provides reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. One of its main objectives is to protect human health, wellbeing and the environment by providing reasonable measures for securing ecologically sustainable and responsible development while promoting justifiable economic and social development. The proposed Nooitgedacht Retirement Estate development seeks to incorporate such measures in order to ensure adequate and sustainable waste management on site. A waste management license application is however not required in accordance with the legislation.

The Department of Environmental Affairs is responsible for the implementation and overseeing of this legislation along with the South African National Biodiversity Institute (SANBI).

3.2.1.8 National Development Plan – 2030 (NDP)

Chapter 10 of the NDP discussed the promotion and importance of health in the country. Underpinning the national health system philosophy are two interlinked ideas: the equalising principles of primary health care and the decentralised, area based, people centred approach of the district health system. Primary healthcare emphasises globally endorsed but widely neglected values such as universal access, equity, participation and an integrated approach. It emphasises the importance of prevention and using appropriate technology.

The proposed development will therefore contribute to this vision of the NDP through provision of healthcare to the retired and elderly in the community.

3.2.2 Provincial

3.2.2.1 Mpumalanga Nature Conservation Act (Act 10 of 1998)

In addition to the NFA, the Mpumalanga Nature Conservation Act also makes provision for the protection and sustainable utilisation of wild animals, aquatic biota and plants on a provincial scale in the Mpumalanga Province. It is therefore used in conjunction with the NFA to determine the ecological/biodiversity significance, value and subsequent management of the proposed project area.

The Mpumalanga Nature Conservation Act was utilised to determine the potential presence of any provincially protected or specially protected species in the proposed project area in order to ensure that the correct processes are followed for the approval of any listed activities for which a permit may be necessary regarding such species, should it be required.

Permit applications in terms of the Mpumalanga Nature Conservation Act (Act 10 of 1998) are lodged with the relevant provincial authority, which in this case is the Department of Economic Development, Environment and Tourism in the Mpumalanga Province.

3.2.3 Local

3.2.3.1 Mbombela Local Municipality Spatial Development Framework 2011 - 2030

The ultimate goal of the SDF is to achieve the desired spatial form of the municipality. The purpose of a SDF is to guide all decisions of a municipality relating to the use, development and planning of land and should have the following key objectives:

- To provide a strategic and indicative forward planning tool to guide decisions on land development;
- To provide a set of policies, principles and directives for spatial development;
- To provide a clear and logical framework for private and public sector investment;
- To promote sustainable development in terms of the natural and built environment;
- To facilitate social, economic and environmental sustainability;
- To provide a framework for dealing with key issues such as natural resource management, land reform and land use management;
- To facilitate the development of aesthetic urban form and landscape; and
- To guide and inform directions of growth and major movement routes.

The proposed project will be able to contribute positively to these objectives through planned infrastructure and service delivery development for the local and district community, job creation and sustainable capacity building (skills development and experience).

3.3 RELEVANT GUIDELINES

The table below lists the Guideline Documents that are applicable to the proposed project, and which are considered as part of the EIA process, as are required in terms of the NEMA EIA Regulations; 2014.

Table 3: Applicable guideline documents

1	DETEA EIA Guideline and Information Document Series
1.1	<i>Draft Guideline on the Need and Desirability in terms of the EIA Regulations of 2010. Integrated Environmental Management Guideline Series 9, Government Notice 792 of 2012.</i>
2	DEA & DP EIA Guideline and Information Document Series
2.1	<i>Guideline on Generic Terms of Reference for EAPs and Project Schedules, EIA Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning, March 2013.</i>
2.2	<i>Guideline on Need and Desirability, EIA Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning, March 2013.</i>
2.3	<i>Guideline on Alternatives, EIA Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning, March 2013.</i>
2.4	<i>Guideline on Public Participation, EIA Guideline and Information Document Series. Western Cape Department of Environmental Affairs & Development Planning, March 2013.</i>
3	DEA&DP Guideline Document Series for Involving Specialists in the EIA Process, and others
3.1	<i>Guideline for Environmental Management Plans. CSIR Report No ENV-S-C2005-053 H. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town (Lochner, P. 2005).</i>

3.4 NEMA LISTED ACTIVITIES TRIGGERED BY THE PROPOSED PROJECT

The development activities in the National Environmental Management Act (Act 107 of 1998): Environmental Impact Assessment Regulations, 2014 (Government Notices R983, R984 and R985 in Government Gazette No. 38282 of 04 December 2014) which are triggered by the proposed project are listed in the table below:

Table 4: Environmental Impact Assessment Regulations, 2014 listed activities triggered by the proposed project

Regulation	Activity	Description of trigger activity in proposed project
<p>GN R 327 Listing Notice 1 (as amended)</p>	<p>Activity 12</p> <p>The development of –</p> <p>(ii) infrastructure or structures with a physical footprint of 100 square metres or more</p> <p>where such development occurs –</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse</p>	<p>The proposed development’s southern boundary will occur in some instances within 32m from the edge a watercourse</p>
<p>GN. R. 327 Listing Notice 1 (as amended)</p>	<p>Activity 27</p> <p>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation</p>	<p>The maximum area size of the footprint of the proposed development will be 9 ha. Natural, indigenous vegetation will have to be cleared on the proposed development footprint due to construction requirements.</p>
<p>GN. R. 327 Listing Notice 1 (as amended)</p>	<p>Activity 30</p> <p>Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).</p>	<p>The footprint of the proposed area falls within a national threatened ecosystem listed as vulnerable.</p>
<p>GN. R.325 Listing Notice 1 (as amended)</p>	<p>Activity 6</p> <p>The development of resorts, lodges, hotels, tourism or hospitality facilities that sleeps 15 people or more.</p>	<p>The proposed development fall within 100 metres of a watercourse.</p>

Regulation	Activity	Description of trigger activity in proposed project
	(hh) Areas within a watercourse or wetland, or within 100 metres of a watercourse or wetland	
GN. R. 325 Listing Notice 1 (as amended)	Activity 12: The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.	The footprint of the proposed area falls within a national threatened ecosystem listed as vulnerable. The proposed development will also result in the clearance of an area of 300 square metres or more of indigenous vegetation.

3.5 NEMA REGULATION 23 EIA REPORT INFORMATION COMPLIANCE

Regulation 19 of the Environmental Impact Assessment Regulations, 2014 (Government Notices R982 in Government Gazette No. 38282 of 04 December 2014) refers to Appendix 1 which provides the content requirements for an BA Report.

The table below lists the relevant requirements for the BA Report as per Appendix 1 of the Regulations as well as providing cross-references to where the relevant information is located in this document and/or its appendices.

Table 5: Information required in the BA Report as per Appendix 1 of GN R. 982 of the EIA Regulations, 2014 as amended on 7 April 2017

EIA Regulations 2014 - Appendix 1 – Scope of assessment and content of basic assessment reports	Location in this document
(a) details of – (i) the EAP who prepared the report, and (ii) the expertise of the EAP, including a curriculum vitae;	Section 2 Appendix A
(b) the location of the activity, including: (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 4

EIA Regulations 2014 - Appendix 1 – Scope of assessment and content of basic assessment reports	Location in this document
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale;	Section 4 Appendix B
(d) a description of the scope of the proposed activity, including – (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;	Section 3 Section 4
(e) a description of the policy and legislative context within which the development is proposed including – (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools framework, and instruments;	Section 3
(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 5
(g) a motivation for the preferred site, activity and technology alternative;	Section 6
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including: (i) details of all the alternatives considered; (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic,	Section 6 Section 9

EIA Regulations 2014 - Appendix 1 – Scope of assessment and content of basic assessment reports	Location in this document
<p>heritage and cultural aspects;</p> <p>(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts –</p> <p style="padding-left: 40px;">(aa) can be reversed;</p> <p style="padding-left: 40px;">(bb) may cause irreplaceable loss of resources; and</p> <p style="padding-left: 40px;">(cc) can be avoided, managed or mitigated;</p> <p>(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risk associated with the alternatives;</p> <p>(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</p> <p>(viii) the possible mitigation measures that could be applied and level of residual risk;</p> <p>(ix) the outcome of the site selection matrix;</p> <p>(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and</p> <p>(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;</p>	
<p>(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including –</p> <p style="padding-left: 40px;">(i) a description of all environmental issues and risk that were identified during the environmental impact assessment process; and</p> <p style="padding-left: 40px;">(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;</p>	Section 9
<p>(j) an assessment of each identified potentially significant impact and risk, including-</p>	Section 9

EIA Regulations 2014 - Appendix 1 – Scope of assessment and content of basic assessment reports	Location in this document
<ul style="list-style-type: none"> (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impacts and risk occurring; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated; 	
<p>(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulation and an indication as to how these findings and recommendations have been included in the final report;</p>	<p>Section 7 Appendix E</p>
<p>(l) an environmental impact statement which contains –</p> <ul style="list-style-type: none"> (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the proposed site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives; 	<p>Section 11 Section 12</p>
<p>(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMP'r;</p>	<p>Appendix I</p>
<p>(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;</p>	<p>Section 7 Appendix E</p>
<p>(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;</p>	<p>Section 10</p>

EIA Regulations 2014 - Appendix 1 – Scope of assessment and content of basic assessment reports	Location in this document
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 11 Section 12
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A
(r) an undertaking under oath or affirmation by the EAP in relation to: <ul style="list-style-type: none"> (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and 	Appendix D
(s) where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Section 7 Appendix E
(t) any specific information that may be required by the competent authority; and	N/A
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

4. PROJECT LOCATION AND DESCRIPTION

The following section provides an overview of the proposed project location as well as a detailed description of the proposed project.

4.1 PROJECT LOCATION

The proposed project area is approximately 12 ha (maximum) in surface footprint size and is situated on Portions 11 & 12 of the farm Nooitgedacht 62 JU (White River Extension 69). The properties fall inside the Mbombela Local Municipality which, in turn, forms part of the greater Ehlanzeni District Municipality, Mpumalanga Province. The farm portions are located directly adjacent east of the R 40 provincial road outside and north-east of the town of White River. Access to the proposed project area is obtained by way of the R 40 provincial road. The White River forms the southern boundary of the properties.

The property is co-owned by Mr & Mrs Visagie (see Appendix F for title deeds) who also reside in the existing homestead located in the north-western portion of the property. The rest of the property is vacant. The land owner has provided consent for the completion of the BA process (see Appendix F).

Table 6: Information of the farm portions associated with the proposed project

Farm Name and Number	SG 21 Digit Code	Land owner
Portion 11, Farm Nooitgedacht 62 JU	TOJU00000000006200011	Mr & Mrs Visagie (co-owned)
Portion 12, Farm Nooitgedacht 62 JU	TOJU00000000006200012	Mr & Mrs Visagie (co-owned)

(See Appendix F for the title deeds)

See locality map below.

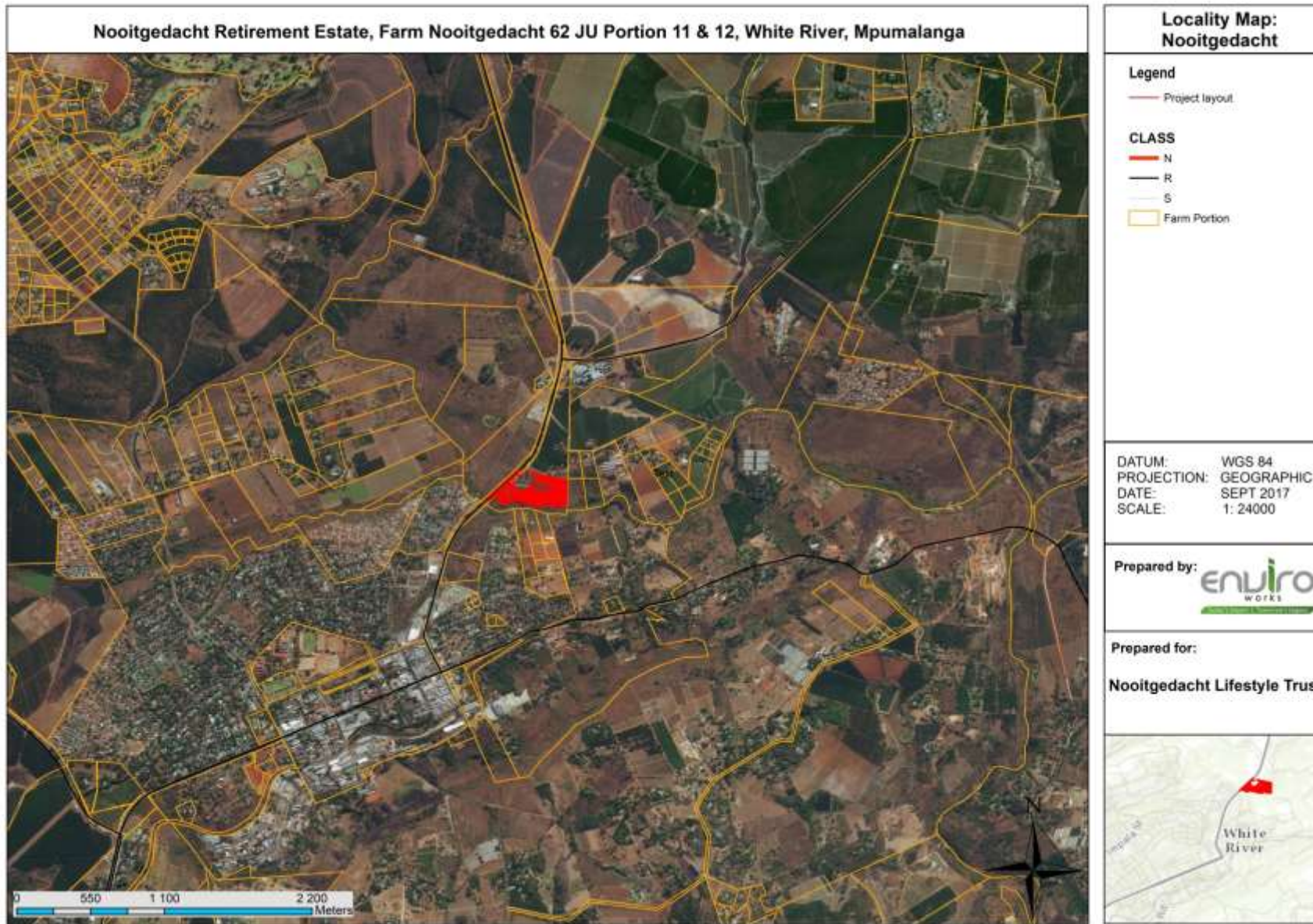


Figure 1: Locality map of the proposed development (see Appendix B for A3 size)

The four corner coordinate points for the corners of the proposed project area are as follows:

- North-western corner 25°18'48.28"S 31°01'40.91"E
- North-eastern corner 25°18'51.00"S 31°01'51.17"E
- South-eastern corner 25°18'57.59"S 31°01'50.81"E
- South-western corner 25°18'55.74"S 31°01'32.90"E

Table 7: Details of relevant land owner of Portions 11 & 12

Company/entity name:	Gerrit Marthinus Visagie and Petronella Cornelia Visagie
Contact person:	Penny Visagie
Designation:	Co-owner
Contact number:	082 466 4530
E-mail address:	pennyvisagie@telkomsa.net

A general visual illustration of the proposed project area is provided in the figures below while the location of the proposed project area in relation to the nearby town, access roads and adjacent farms is illustrated on the locality map in the figure above (also see Appendix I for the Photo Report):



Figure 2: Image visually illustrating the general landscape of the proposed project area



Figure 3: Image visually illustrating the general landscape of the proposed project area



Figure 4: Image visually illustrating the general landscape of the proposed project area

4.2 PROJECT DESCRIPTION

Nooitgedacht Lifestyle Trust, the applicant, proposes the development of a Retirement Estate on approximately 12 ha (maximum) of Portions 11 & 12 of the Farm Nooitgedacht 62 JU (White River Extension 69), Mbombela Local Municipality, Mpumalanga Province. The proposed development will entail a retirement village and hospice development which will provide quality medical services as well as a variety of residential options.

The development will consist of 63 single residential stands. There are 7 types of house plans to choose from and will be sold as plot and plan. There will be 104 sectional title units consisting of one bedroom and two bedroom units. One of the sectional title blocks will be allocated to 34 assistant living units. One hectare of the property will be allocated for a medical clinic that will consist of consulting rooms with 72 Hospital beds.

Hamatino Consulting Engineers was appointed by the developer, Nooitgedacht Lifestyle Trust (REF NR IT000081/2017 (MN), to prepare and storm water management plan/report. The *Aloe Simii* buffer was taken into account with the design of the storm water management plan. This detailed storm water management plan with associated designs and drawings, will indicate how surface runoff generated as a result of the township development (during both construction and operation phases) will be managed prior to entering the White River to the south of the proposed development.

It is envisaged that the estate construction phase will take approximately 3 years to complete, while the operational phase will continue for an undisclosed period of time (multiple years).

If the operational phase is ever concluded in the future and the estate needs to be demolished, the area will be suitable rehabilitated in order to return the project area to a self-sustainable ecological state.

4.3 PROJECT SERVICES

4.3.1 Electricity Supply

IntoTec Consulting Engineers was appointed to conduct a study and subsequently compile an electrical engineering report for a proposed lifestyle development – Nooitgedacht. The development falls in the distribution area of the City of Mbombela. The City of Mbombela has confirmed that capacity is available on the existing electrical network to supply this development. Capacity is available on the existing electrical reticulation network to supply this development with a connection of 800 kVA

- Refer to the electrical specialist report in Appendix E.

4.3.2 Water supply and Sewage Management

- Proposed separate water and sewage transport pipelines will be constructed and will commence from a tie-in point into the existing municipal water and sewage infrastructure.
- Sufficient portable chemical toilets will be supplied on site for the manual labourers during the construction phase. These toilets will be cleaned and waste removed and adequately disposed of by an appropriate registered contractor on a regular basis as and when required.

4.3.3 Solid Waste Management

- Solid building and general waste generated on site during the construction phase will be removed and adequately disposed of by a suitable, registered waste contractor at the local municipal landfill site on a regular basis as and when required.
- Solid general waste generated by residents of the estate during the operational phase will be removed and adequately disposed of by a suitable, registered waste contractor at the local municipal landfill site on a regular basis as and when required.
- It is envisaged that no significant hazardous waste will be generated on site during the construction or operational phases of the project. If any significant hazardous waste is however generated a suitable, registered waste contractor will be contracted to remove and adequately dispose of such waste at a suitable landfill site.

5. NEEDS AND DESIRABILITY OF THE PROJECT

Various key factors must be taken into consideration as motivation/incentive for the potential benefits involved with the proposed project. These factors have been summarised below:

Retirement Villages in general are very well maintained residential establishments and often uplift the character of the surrounding area which subsequently results in increase in property value. The proposed retirement village and medical centre will be the only new development in White River, specifically catering for the elderly. Existing retirement village development in greater Mbombela is either sold out, fully occupied or are being developed in accordance with market demand. In terms of municipal service provision, retirement units have less impact on municipal service provision compared to standard residential properties. The new development will attract new capital investment in White River, but will also result in significant increase in property rates and taxes to Mbombela Municipality.

- Providing high quality medical services to the local (White River) and broader (Mbombela) community;
- Providing a community/health facility in close proximity to a retirement community and broader, large elderly population;
- Broadening the residential options in the White River ;
- Establishing a high quality residential environment for the elderly population;
- Providing a broad spectrum of housing/accommodation options;
- Ensuring that the frail elderly receive quality health care, but continue to stay integrated with village life;
- To promote structures that are contextually sympathetic to the topography, landscape and natural colours of the environment;
- Maintaining and upgrading the visual amenity value of the area;
- Creating employment opportunities in the short and long-term.

According to Census 2011 the Mbombela Local Municipality has a total population estimated at 588 794 with a growth rate of 2.11. Unemployment is 28.1 %. The establishment of the development will take approximately 3 years to complete and the construction phase will provide significant employment opportunities and the experience and skills involved in completing the establishment processes will provide valuable capacity building and skills development and transfer. Thirty individuals will also be permanently employed for the proposed development.

Construction and operational phase job creation (principle of local employment will be followed as far as practicably possible) and sustainable capacity building (skills, experience and resources development) of this project will aid in immediate and continuous local community upliftment and poverty alleviation and are therefore regarded as significant socio-economic benefits associated with the proposed project to motivate the need and desirability. As discussed under heading 3, the outcomes of this project are also in line with the requirements and objectives of the National Development Plan and the Mbombela Local Municipality Spatial Development Framework.

Portions 11 & 12 of the farm Nooitgedacht 62 JU (White River Extension 69) are currently in a disturbed and degraded ecological state due to historic and continued negative anthropogenic impacts but this will be significantly improved through active ecological rehabilitation initiatives which will be discussed in more detail under heading 7 of this report. Should the portion not be developed and efficiently rehabilitated and

maintained, the ecological condition of the area will continue to deteriorate which will have a considerable negative effect on the persistence of the critically endangered *Aloe simii* population present on site (this will be discussed in detail under heading 7).

6. ALTERNATIVES CONSIDERED

According to Chapter 1 of NEMA EIA Regulations 2014, Notice R982, “*Alternatives*”, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to-

- (a) The **property** on which or **location** where it is proposed to undertake the activity;
- (b) The **type** of activity to be undertaken;
- (c) The **design** or **layout** of the activity;
- (d) The **technology** to be used in the activity;
- (e) The **operational** aspects of the activity; and
- (f) The option of **not implementing** the activity.

These NEMA EIA Regulations 2014, Notice R982, recognises that details on alternatives need to include “*a description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity*”.

The consideration of alternatives is therefore a key component of a BA process. While an BA process should investigate and comparatively **consider** all alternatives that have been identified, only those found to be “feasible” and “reasonable” must be comparatively **assessed**, in terms of the advantages and disadvantages that the proposed activity and alternatives will have on the environment and on the socio-economic aspects of communities that may be affected by the activity.

The “feasibility” and “reasonability” of an alternative are measured by:

- the general purpose and requirements of the activity;
- the need and desirability of the activity;
- opportunity costs;
- the need to avoid and/or minimise negative impacts;
- the need to maximise benefits; and
- how it impacts on the community that may be affected by the activity (DEA&DP, 2013b).

The following sections provide an overview of the alternatives considered.

6.1 LOCATION ALTERNATIVES

The proposed site falls within the planned municipal expansion and infrastructure framework as defined by the Spatial Development Framework and hence no alternative viable site locations were identified and evaluated for the project. No alternative sites were thus considered for this development.

6.2 DESIGN LAYOUT ALTERNATIVES

Two alternative estate designs layouts were considered for the project in order to adequately conserve the critically endangered *Aloe simii* population present on site.

The original design layout (Alternative 2) fully covered the entire project area and would have destroyed the critically endangered *Aloe simii* population present on site. After consultation with the Mpumalanga Tourism & Parks Agency and the ecological specialists, the proposed design layout was however significantly revised

in order to provide for an adequate 1.3 ha buffer zone for the critically endangered *Aloe simii* population present on site (Alternative 1 preferred). Active ecological rehabilitation initiatives also form part of the *Aloe simii* population management plan in order to improve the ecological condition and functionality of the local habitat to subsequently ensure the continued persistence of the population. The buffer zone and rehabilitation initiatives will be discussed in detail under heading 7.

See figure below indicating the two design layout alternatives namely Alternative 1 (preferred) and Alternative 2.

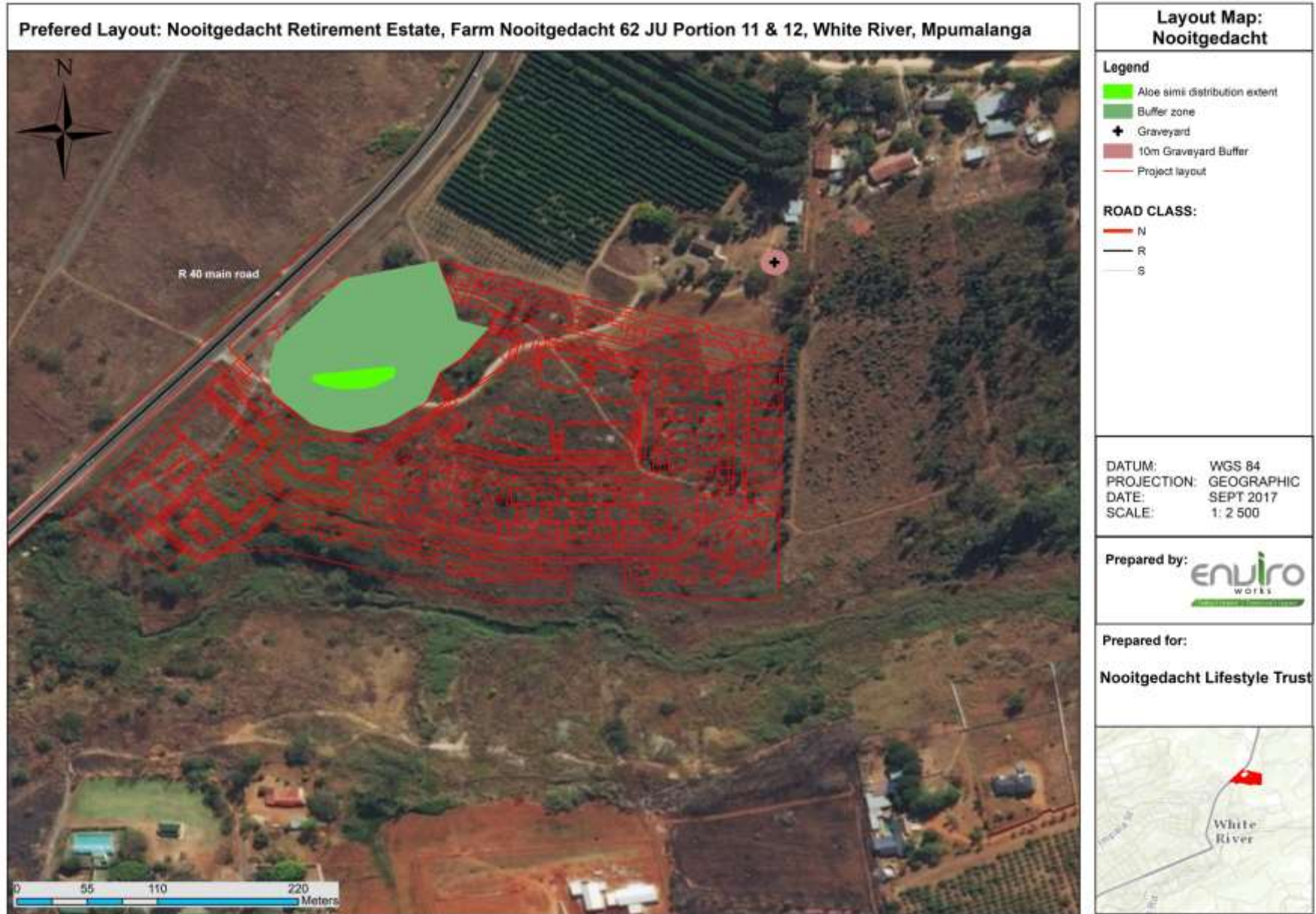


Figure 5: Preferred Alternative for the proposed development (see Appendix B for A3 size)



Figure 6: Second Alternative for the proposed development (see Appendix B for A3 size)

6.3 NO-GO OPTION

Advantages

The potential negative environmental impacts associated with the proposed project and its alternatives as identified under Section 9 will be avoided if the proposed project is not implemented. No significant or unacceptably high environmental impacts were however identified which could not be adequately mitigated to within acceptable levels.

Disadvantages

If the proposed project however does not go ahead, the local communities will forego the economic benefits which the project will have on the area such as immediate additional employment opportunities and revenue streams and most importantly, sustainable capacity building (skills, experience and resources development) for the future. The benefits as discussed under heading 5 will also then not be realised.

Portions 11 & 12 of the farm Nooitgedacht 62 JU (White River Extension 69) are currently in a disturbed and degraded ecological state due to historic and continued negative anthropogenic impacts but this will be significantly improved through active ecological rehabilitation initiatives which will be discussed in more detail under heading 7 of this report. Should the portion not be developed and efficiently rehabilitated and maintained, the ecological condition of the area will continue to deteriorate which will have a considerable negative effect on the persistence of the critically endangered *Aloe simii* population present on site (this will be discussed in detail under heading 7).

The no-go option is therefore not recommended.

7. DESCRIPTION OF THE ENVIRONMENT

The following section provides an overview of the bio-physical as well as the socio-economic environments of the proposed project. The table below indicates the list of specialist studies that were conducted during the assessment process:

Table 8: List of Specialist Studies Conducted

Specialist Name	Organisation	Specialist Assessment Type
Danie van der Walt	Afrika Enviro and Biology	Original Ecological and Wetland Impact Assessment
Rikus Lamprecht	Enviroworks	Aloe simii Ecological Impact Assessment
Report externally reviewed by Prof. Johann du Preez	Enviro-Niche Consulting	
Christine van Wyk Rowe	Adansonia Heritage Consultants	Archaeological and Palaeontological Impact Assessment

7.1 BIO-PHYSICAL DESCRIPTION

This section provides a comprehensive description of the bio-physical environment of the proposed project area.

7.1.1 Climate

The area receives summer rainfall with a MAP of between 700 mm and 1150 mm. The lower altitude areas do not receive frequent frosts. The mean monthly minimum and maximum temperatures for the Nelspruit areas are 35.7°C and 1.6°C for October and July respectively (Mucina & Rutherford, 2006).

7.1.2 Geology and Soils

The majority of the area is underlain by gneiss and magmatite of the Nelspruit Suite. Soils are mostly Mispa, Glenrosa and Hutton forms; which are varying shallow to deep gravelly and well drained (Mucina & Rutherford, 2006).

7.1.3 Topography

The topography and elevation of the local area slopes relatively steeply from the north-east downslope towards the south-west (see distribution map above). The majority of surface water runoff therefore occurs in this south-westerly direction and ultimately ends up in the White River. From the information received from the current landowners (whom have occupied the property for approximately 40 years) this steep topography has resulted in relatively intense surface water runoff events in the past and such runoffs still continue to occur on a frequent basis after rainfall events in the area.

7.1.4 Ecological and Wetland Impact Assessment

An Ecological and Wetland Impact Assessment was conducted for the proposed project area in order to determine the ecological value/significance and subsequent conservational importance and sensitivity of the area. The potential impacts that the proposed project will have on the ecology of the area were identified and evaluated to determine possible mitigation measures which could be implemented in order to

acceptably reduce the significance of the associated impacts. An overview of the ecological aspects surrounding the proposed project is provided in the section below in accordance with the specialist report:

According to Mucina & Rutherford (2006) the proposed project area forms part of the Legogote Sour Bushveld vegetation type (SVI 9) which mainly consists of gently to moderately sloping upper pediment slopes with dense woodland including many medium to large shrubs (Mucina & Rutherford, 2006). In less rocky areas the vegetation type is characterised by short thicket. The vegetation structure and species encountered on the proposed project area however indicate that the vegetation type is in a degraded and transformed state as opposed to its naturally expected form. The proposed project area is mostly characterised by fragmented grassland with a very sparse woody component (few shrubs and trees). This vegetation type is classified as endangered and extensive transformation has occurred mainly due to plantations, cultivation and urban development (Mucina & Rutherford, 2006).

The majority of the proposed project area is classified as heavily to moderately transformed as per the Provincial Spatial Biodiversity Plan. The White River and its associated riparian zone is however classified as a Critical Biodiversity Area (CBA). Critical Biodiversity Areas are areas which play an important role in conservation and reaching certain required biodiversity targets for ecosystem types, species or ecological processes. This CBA will however not be directly impacted upon by the proposed development as the development footprint will stay outside the identified 1:100 year flood line and riparian zone.

The location of the proposed project area in relation to the various vegetation types as well as potential ecologically sensitive features in the area is illustrated in the vegetation and sensitivity maps in the figures below:



Figure 7: Vegetation map of the proposed development (see Appendix B for A3 size)



Figure 8: Ecological and Heritage sensitivity map of the proposed development (see Appendix B for A3 size)

Results and Discussion of the Ecological Specialist Report (see Appendix E for the full report)

General site description and land uses

The site is located on the northeastern edge of the town of White River, directly to the north of the White River in an area consisting of small holdings and small farm portions. The river is perennial and the water quality is seriously polluted by sewage from an unknown source. No wetlands were identified. Manmade features on the site include dwelling houses, ruins of dwellings, dirt roads/tracks and unused irrigation canal. The site is heavily invaded by weeds and invasive alien vegetation can be described as being derelict and unused.

Habitats & vegetation

Fragmented and degraded grassland

This vegetation community is found on the plain that covers the larger study site (excluding the valley bottom). This grassland is fragmented mainly as result of invasive and weeds. Dominant grasses are *Hyparrhenia cymbaria*, *Sporobolus africanus* and *Themeda triandra*. Dense stands of *Vernonia crataegifolia*, *Vernonia adoense* and *Lippia javanica* are present in places. Other commonly found grassland forbs and wild flowers are *Berkheya setifera*, *Hypoxis angustifolia*, *Nidorella anomala*, *Hypoxis iridifolia*, *Helichrysum allioides*, *Thunbergia anomala*, *Helichrysum rugulosum*, *Aloe parvibracteata* and *Gladiolus crassifolius*. A large thicket of bamboo is present (and spreading) on the western section and a thicket of weeds dominated by *Solanum mauritanium*, *Tecoma stans* and *Lantana camara* is predominant on the central section. Several old Avocado, Pecan, Macadamia and Mango trees are also randomly present. The Red Data Listed species, *Aloe simii*, was recorded at one location near the main dwelling. The Mpumalanga endemic sword lily, *Gladiolus densiflorus*, is also frequently present, especially in the area near to the riparian zone.

There are several negative impacts originating on site and in the surrounding land that have impoverished the distribution of biota and the ecological integrity of this habitat:

- The remaining natural grassland areas are relatively small and fragmented.
- Fragmentation is continuing as result of encroaching weeds and invasive vegetation.
- Pollution and human activities will discourage sensitive species of fauna from being present.
- It is evident that annual veld fires drive the biodiversity assemblage into a negative direction.
- The grassland survives without private or official protection - without which it will eventually disappear as result of the above impacts and drivers.

These impacts will have a significant impact on the biodiversity maintenance function (especially on fauna) of this grassland. As result of all the above mentioned reasons it has a medium sensitivity rating which can only be improved by formally and physically protecting the site.

Riparian zone

Macro channel zone

This area represents the transition zone from terrestrial to riparian habitat and is present on the relatively steep slope declining towards the river. The macro channel bank can be physically distinguished and the vegetation indicators support this finding. Grasses include climax species such as *Themeda triandra* and *Hyparrhenia cymbaria* as well as species associated with periodic moistness such as *Hemarthria altissima*, *Digitaria eriantha*, *Arundinella nepalensis*, *Ischaemum fasciculatum*, *Eragrostis plana* and *Imperata cylindrica*. Dense stands of *Pteridium aquilinum* are also

present in places and the Mpumalanga endemic sword lily, *Gladiolus densiflorus*, is also frequently present in this zone. Shrubs present are *Diospyros* and *Rhus* and the only large trees present are examples of *Acacia sieberiana*. This zone ends where the active channel bank marks the transition to the active channel zone that is described below.

Active channel - instream zone

This zone covers the area between the active channel bank (approximately 10m from the water's edge) and the bottom of the channel (where flow is present). This includes the marginal zone (edge of the stream / river) and the instream zone (area inundated with water). The vegetation present on the active channel zone is similar to the vegetation structure described in the previous section. The marginal zone vegetation is distinct and is typified by the following taxa: *Phragmites australis*, *Typha capensis*, *Schoenoplectus brachyceras*, *Juncus effuses*, *Persicaria sp*, the fern *Blechnum tabulare* and the hydrophilic grasses *Setaria pallide-fusca*, *Echinochloa colona* and *Paspalum dilatatum*. *Phragmites australis* and *Typha capensis* are representative of the instream vegetation. Several large and very tall, but dead *Eucalyptus* trees are present in this zone.

This investigation was performed during winter and as result not many flowering species were recorded. However, this habitat can be regarded as very important for RDL plants and has a high potential for providing habitat for more than one RDL species, e.g.: *Crinum macowanii*, *Aloe kniphofioides* and *Aloe simii* and this zone was intensively searched for these and other RDL species but none were recorded in this zone to date.

The riparian habitat has a very important ecological function as it presents a corridor for the movement of fauna along the length of the river. Furthermore, it offers refuge to fauna and flora and has a high potential of maintaining populations of RDL plants and fauna. Additionally the riparian vegetation stabilizes the stream channel, preventing erosion. For these reasons it has a high sensitivity rating and must be conserved.

Negative impacts on the ecological integrity of the riparian zone and watercourse include the following:

- A loss of indigenous riparian trees has occurred in the historic past.
- Seasonal increase in flow volume as result of increased runoff from residential areas and roads.
- Pollution as result of large volumes of sewage entering the river from the nearby residential areas.
- The old (destroyed) road bridge structure lies diagonally across the stream channel next to the R40 bridge.
- Unfortunately, the riparian zone to the south of the river (off site) has been largely destroyed by the installation of a sewage pipeline and informal crop gardens.

Transformed land

For the purpose of this report, transformed land refers to areas that have been changed or disturbed to such an extent that all natural habitats, biota and ecosystem functions have been fragmented or lost and rehabilitation or conservation is not regarded as an option. On site, these areas include areas transformed by thickets of exotic vegetation and *Eucalyptus* plantations, roads infrastructure,

dwellings and buildings and areas dominated by invasive vegetation. These areas are of low sensitivity and biodiversity value.

Occurrence of important flora species

Conservation-important, naturally occurring species can be categorized according to specific features that are important, usually due to rarity, habitat specificity, medicinal value, ecological value, endemism, over-exploitation, economic value or a combination of these. Species of conservation importance are either categorized as Red Data Listed species (RDL species), according to specific scientifically researched criteria and administered by the South African National Biodiversity Institute (SANBI), or as Protected Trees and Plants by the National and Provincial nature conservation legislation. Using the flora checklist obtained from SANBI (POSA data download) and literature consulted list a Red Data List for the larger study area was compiled.

Table 9: National RDL species potential for the relevant quarter degree grid (2531DA)

Family	Scientific Name	National Status	Endemic Status
AMARYLLIDACEAE	<i>Crinum macowanii</i> Baker	Declining	No
AMARYLLIDACEAE	<i>Cyrtanthus eucallus</i> R.A.Dyer	VU	Yes
AQUIFOLIACEAE	<i>Ilex mitis</i> (L.) Radlk. var. <i>mitis</i>	Declining	No
ASPHODELACEAE	<i>Aloe kniphofioides</i> Baker	VU	Yes
ASPHODELACEAE	<i>Aloe simii</i> Pole-Evans	CR	Yes
ASTERACEAE	<i>Helichrysum homilochrysum</i> S.Moore	Rare	Yes
CELASTRACEAE	<i>Elaeodendron croceum</i> (Thunb.) DC.	Declining	No
CORNACEAE	<i>Curtisia dentata</i> (Burm.f.) C.A.Sm.	NT	No
CYATHEACEAE	<i>Cyathea capensis</i>	Declining	No
DIOSCOREACEAE	<i>Dioscorea sylvatica</i> Eckl. var. <i>brevipes</i> (Burt Davy)	VU	No
DIOSCOREACEAE	<i>Dioscorea sylvatica</i> Eckl. var. <i>sylvatica</i>	VU	No
FABCEAE	<i>Eriosema naviculare</i> C.H.Stirt.	EN	No
GUNNERACEAE	<i>Gunnera perpensa</i> L.	Declining	No
HYACINTHACEAE	<i>Eucomis autumnalis</i> (Mill.) Chitt. subsp. <i>amaryllidifolia</i> (Baker) Reyneke	NE	No
HYACINTHACEAE	<i>Eucomis autumnalis</i> (Mill.) Chitt. subsp. <i>clavata</i> (Baker)	NE	No
HYACINTHACEAE	<i>Merwillia plumbea</i> (Lindl.) Speta	NT	No
HYPOXIDACEAE	<i>Hypoxis hemerocallidea</i> Fisch., C.A.Mey. & Avé-Lall.	Declining	No
LAURACEAE	<i>Ocotea kenyensis</i> (Chiov.) Robyns & R.Wilczek	Rare	No
MYRSINACEAE	<i>Rapanea melanophloeos</i> (L.) Mez	Declining	No

Family	Scientific Name	National Status	Endemic Status
ORCHIDACEAE	<i>Ansellia africana</i> Lindl.	Declining	No
ORCHIDACEAE	<i>Disa extincoria</i> Rchb.f.	NT	No
ORCHIDACEAE	<i>Platycoryne mediocris</i> Summerh.	EN*	No
PASSIFLORACEAE	<i>Adenia gummifera</i> (Harv.) Harms var. <i>gummifera</i>	Declining	No
PHYLLANTHACEAE	<i>Bridelia cathartica</i> G.Bertol. subsp. <i>melanthesoides</i> var. <i>melanthesoides</i> forma <i>melanthesoides</i>	NE	No
PROTEACEAE	<i>Faurea macnaughtonii</i> E.Phillips	Rare	No
WOODSIACEAE	<i>Hypodematum crenatum</i> (Forssk.) Kuhn	VU	No
ZAMIACEAE	<i>Encephalartos ghellinckii</i> Lem.	VU	Yes
ZAMIACEAE	<i>Encephalartos humilis</i> I.Verd.	VU	Yes
ZAMIACEAE	<i>Encephalartos laevifolius</i> Stapf & Burttt Davy	CR	No
	<i>Siphonochilus aethiopicus</i> (Schweinf.) B.L.Burttt	CR	No

One RDL species (*Aloe simii*) and one important endemic (*Gladiolus densiflorus*) was recorded. Also of conservation importance is the occurrence of alien invasive species and weeds. The control and eradication by landowners of the presence and spreading of such species must be actively regulated. Several important exotic species are present and most of the natural habitats contain alien invader species.

Table 10: Invasive vegetation and weeds identified on site

Scientific Name	CARA Category	Scientific Name	CARA Category
<i>Cirsium vulgare</i>	Category 1 weed	<i>Pennisetum clandestinum</i>	Naturalized/weed
<i>Datura stramonium</i>	Category 1 weed	<i>Amaranthus viridis</i>	Naturalized/weed
<i>Pyracantha angustifolia</i>	Category 3 invader	<i>Conyza albida</i>	Naturalized/weed
<i>Ricinus communis</i>	Category 2 invader	<i>Tagetes minuta</i>	Naturalized/weed
<i>Tecoma stans</i>	Category 1 weed	<i>Bidens pilosa</i>	Naturalized/weed
<i>Solanum mauritanium</i>	Category 1 weed	<i>Verbena bonariensis</i>	Naturalized/weed
<i>Melia azeredach</i>	Category 1 weed		

Terrestrial Fauna Report

The fauna investigation was not a comprehensive specialist survey but rather an overview of the available habitats and their potential to be utilized by fauna listed in the checklists prepared by a literature study. However, the affected area was well searched for fauna actually present as well as field signs of fauna present. With view of the consequences of past and present impacts and the frequent daily human activities on and around the development site, it is expected that fauna sensitive to these disturbances and impacts have already moved to more tranquil surroundings (off-site). It can therefore be expected that only taxa that cannot easily move away or that are unaware or unaffected by these impacts will be present.

Amphibians

A variety of frogs will utilize the aquatic and terrestrial habitats on the property for several reasons, including breeding purposes. Essential habitats for the survival of frogs on the property include the wetland, stream, and grassland. Frogs are rather sensitive to pollution and ecological imbalances, thus the presence of frogs indicate that the habitats where they are recorded are healthy and of good ecological integrity. Thirty frog species' range of distribution includes the study area, none of these have Red Data status. Only one species, the yellow-striped reed frog (*Hyperolius semidiscus*), is regarded as endemic.

The remaining natural habitats will be important for maintaining a diverse frog assemblage. Especially the wetland and adjoining grassland areas will be of high importance to the ecology of frogs.

Reptiles

The terrestrial, riparian and arboreal habitats present have the potential to provide habitat for a diverse group of reptiles. Approximately 98 species of reptiles can potentially occur in the study area. The region possess several important endemic species: Three Endemic species are expected regionally: Haacke's Flat Gecko *Afroedura (multiporis) haackei*, (provincial Endangered status), Barberton Girdled Lizard *Cordylus warreni barbertonensis* and Wilhelm's Flat Lizard *Platysaurus wilhelmi*. All of these have a limited range of distribution roughly covering the area between Nelspruit, Barberton, Malelane and the southerly Kruger National Park. Thus these three last mentioned taxa are not expected on site or in the surrounding area.

The only Red Data species expected is the African rock python (*Python natalensis*), Natal Hinged Tortoise (*Kinixys natalensis*) and the variegated wolf snake (*Lycophidion variegatum*). However, due

to the site locality, small size and degraded quality of the remaining natural habitats it is not anticipated that any of the important species will be present. For the same reasons, it can be expected that the general reptile assemblage on site will be impoverished.

Table 11: Important reptiles of the larger study area.

Common name	Scientific name	Occurrence Potential	SA Red Data status	CITES	Endemism
Giant Legless Skink	<i>Acontias plumbeus</i>	Possible			Southern A
Haacke's Flat Gecko	<i>Afroedura (multiporis) haackei</i>	Unlikely			Mpumalanga
Flap-neck Chamaeleon	<i>Chamaeleo dilepis</i>	Possible		App II	
Barberton Girdled Lizard	<i>Cordylus (warreni) barbertonensis</i>	Unlikely		App II	Mpumalanga
Tropical Girdled Lizard	<i>Cordylus tropidosternum</i>	Possible		App II	
Transvaal Girdled Lizard	<i>Cordylus vittifer</i>	Possible		App II	Southern A
Southern Brown Eggeater	<i>Dasypeltis inornata</i>	Unlikely			Southern A
Leopard Tortoise	<i>Geochelone pardalis</i>	Possible		App II	
Natal Hinged Tortoise	<i>Kinixys natalensis</i>	Unlikely	Rare	App II	Southern A
Speke's Hinged Tortoise	<i>Kinixys spekii</i>	Unlikely		App II	
Spotted House Snake	<i>Lamprophis guttatus</i>	Possible			S A
Cape Thread Snake	<i>Leptotyphlops conjunctus conjunctus</i>	Possible			Southern A
Distant's Thread Snake	<i>Leptotyphlops distanti</i>	Possible			Southern A
Dusky-bellied Water Snake	<i>Lycodonomorphus laevisissimus</i>	Possible			SA
Variiegated Wolf Snake	<i>Lycophidion variegatum</i>	Possible	Peripheral		Southern A
Spotted Dwarf Gecko	<i>Lygodactylus ocellatus</i>	Unlikely			Southern A
Transvaal Thick-toed Gecko	<i>Pachydactylus affinis</i>	Possible			Southern A
Van Son's Thick-toed Gecko	<i>Pachydactylus vansoni</i>	Possible			Southern A
Wilhelm's Flat Lizard	<i>Platysaurus (intermedius) wilhelmi</i>	Unlikely			Mpumalanga
Sundevall's shovel snoute	<i>Prosymna sundevalli</i>	Unlikely			Southern A
Southern African Python	<i>Python natalensis</i>	Unlikely	Vulnerable	App II	
Hewiit's Dwarf Burrowing Skink	<i>Scelotes breviceps</i>	Possible			Southern A
Bibron's Blind Snake	<i>Typhlops bibronii</i>	Unlikely			Southern A
Rock Monitor	<i>Varanus albigularis</i>	Unlikely		App II	
Water Monitor	<i>Varanus niloticus</i>	Possible		App II	

Endemic: South Africa; Near Endemic: South Africa, Swaziland, Zimbabwe

Birds

The literature review indicates that a diverse group of birds may utilize the area. More than 200 species' range of distribution falls within the study area and are supported by the available habitats. Due to the topography and habitat types present in the study area, the expected birds will vary from grassland and savannah species to more specialized wetland specific species. A total of 15 endemic and near-endemic and 42 Red Data Listed species are included for the study area.

Table 12: Red Data and Endemic birds that may be present in the study area. National Red Data listed birds according to Barnes (2000).

Scientific name Common name (p Roberts)	Habitat requirements	National Red data Status (Endemis m)	Occurrence Potential
<i>Aegypius occipitalis</i> Whiteheaded vulture (p492)	Dry woodland, arid savannah, often associated with Baobab trees.	VU	Low
<i>Aegypius tracheliotos</i> Lappetfaced vulture (p491)	Open woodland in arid and semi-arid regions. <i>Acacia, Boscia, Terminalia.</i>	VU	Low
<i>Alcedo semitorquata</i> Half collared kingfisher (p173)	Fast flowing streams; clear water and well-wooded banks; rapids. Broken escarpment terrain. Riverbanks to excavate nest tunnels.	NT (Sthrn A)	Low
<i>Anastomus lamelligerus</i> Openbilled stork (p618)	Wetlands – floodplains, pans, marshes, ponds, streams, rivers, dams, lakes.	VU	Low
<i>Aquila ayresii</i> Ayre's eagle (p534)	Dense woodland and forest edges, often in hilly areas.	NT	Low
<i>Aquila rapax</i> Tawny eagle (p529)	Woodlands, lightly wooded areas: needs trees.	VU	Low
<i>Bucorcvus leadbeateri</i> Southern ground hornbill (p158)	Grassland, savanna, woodland. From higher than 2000m in grassland with patches of forests and gorges to lowland <i>Mopane</i> woodland.	VU	Low
<i>Buphagus erythrorhynchus</i> Redbilled oxpecker (p973)	Open savanna. Wide tolerance.	NT	Low
<i>Ciconia nigra</i> Black stork (p626)	Shallow water: streams, rivers, marshes, floodplains, coastal estuaries, large and small dams; dry land. Cliffs for breeding.	NT	Low
<i>Ephippiorhynchus</i>	Large rivers in open savanna, marshes, lake shores	EN	Low

Scientific name Common name (p Roberts)	Habitat requirements	National Red data Status (Endemism)	Occurrence Potential
<i>senegalensis</i> Saddlebilled stork (p625)	and flood plains.		
<i>Falco biarmicus</i> Lanner Falcon (p556)	Open grassland and cleared woodland habitats. Cliff-nester, also in old nests in trees.	NT	Occasional visitor
<i>Gyps africanus</i> Whitebacked vulture (p488)	Drier woodlands, mopane, arid Kalahari; tall trees for roosting and nesting.	VU	Low
<i>Gyps coprotheres</i> Cape Vulture (p489)	Both open country (grasslands) and woodland. Reliant on tall cliffs for breeding and roosting. Wanders widely.	VU	Low
<i>Leptoptilos crumeniferus</i> Marabou stork (p626)	Terrestrial and aquatic habitats, excluding desert and forests.	NT	Low
<i>Mycteria ibis</i> Yellowbilled stork (p617)	Dams, large marshes, swamps, estuaries, margins of lakes and rivers, seasonal wetlands.	NT	Low
<i>Necrosyrtes monachus</i> Hooded vulture (p486)	Mesic savanna. Well-developed woodlands with tall trees, e.g. Mopane, Jackal berry and Nyala tree.	VU	Low
<i>Nettapus auritus</i> Pygmy Goose (p99)	Inland wetlands, mainly in savanna, clear water and drifting vegetation especially water lilies.	NT	Low
<i>Pododica senegalensis</i> African finfoot (p314)	Forest and woodland areas: Streams and rivers lined with reeds, overhanging trees and shrubs. Avoids stagnant and fast flowing water. Perennial watercourses, clear water.	VU	Low
<i>Polemaetus bellicosus</i> Martial Eagle (p538)	Open grassland and scrub. Large trees for nests. Wide range of vegetation types: deserts densely wooded and forested areas.	VU	Low
<i>Sagittarius serpentarius</i> Secretary bird (p542)	Open country: Savanna, open woodland, grassland and dwarf shrubland.	NT	Low
<i>Stephanoaetus coronatus</i> Crowned eagle (p541)	Forests and plantations, dense woodland. Forested gorges in grassland.	NT	Low
<i>Terathopius</i>	Lowland and plains savannah	VU	Low

Scientific name Common name (p Roberts)	Habitat requirements	National Red data Status (Endemism)	Occurrence Potential
<i>ecaudatus</i> Bateleur			

Abbreviations as follows: CR=critically endangered; EN=endangered; VU=vulnerable; T=threatened; NT=near threatened; LC=least concern; DD=data deficient. Endemic status (SA = South Africa; Sthrn A = Southern Africa):

The assemblage of important birds consist mostly of Vultures, Raptors and Storks. However, due to the historic and present land uses in the immediate study area it is unlikely that any of these will be permanent residents. These birds will be permanently present in the relative safety of the KNP (Important Birding Area SA02). Birds residing in the KNP may visit the study site in search of food. It is not anticipated that birds will be significantly affected if mitigation measures are followed as the activity will have a very small ecological footprint and consequently loss of vegetation and habitat will be minimal.

Mammals

Several species of small to medium sized mammals will utilize the natural habitats on the property. The largest species expected to be present are common duiker, red duiker and bushbuck. Thirteen mammals categorized as Red Data may be found in the study area. A further 16 species are listed as “Data Deficient” (DD). It should be noted that “Data Deficient” is not a category of threat. A taxon is listed in this category when there is inadequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status (Friedman & Daly 2004).

Table 13: Red Data listed mammals of the study area (Friedman & Daly, 2004)

Scientific name	Common name	SA Red Data Status	Permanent occurrence	Motivation
<i>Atelerix frontalis</i>	SA Hedgehog	NT	Possible	Habitat inadequate
<i>Crocidura cyanea</i>	Reddish-grey musk shrew	DD	Possible	Habitat adequate
<i>Cloeotis percivali</i>	Short-eared trident bat	CR	Unlikely	Associated with caves
<i>Crocidura flavescens</i>	Greater Red musk shrew	DD	Possible	Habitat adequate
<i>Crocidura fuscomurina</i>	Tiny musk shrew	DD	Possible	Habitat adequate
<i>Crocidura hirta</i>	Lesser red musk shrew	DD	Unlikely	Not preferred habitat
<i>Crocidura marquensis</i>	Swamp musk shrew	DD	Possible	Habitat adequate
<i>Crocidura silacea</i>	Lesser grey-brown musk shrew	DD		

Scientific name	Common name	SA Red Data Status	Permanent occurrence	Motivation
<i>Dasymys incomtus</i>	Water rat	NT	Possible	Habitat adequate
<i>Elephantulus brachyrhynchus</i>	Short snouted elephant shrew	DD	Unlikely	Habitat inadequate
<i>Epomophorus gambianus crypturus</i>	Peter's (Gambian) fruit bat	DD	Possible	Habitat adequate
<i>Graphiurus platyops</i>	Rock dormouse	DD	Unlikely	Habitat inadequate
<i>Hippisideros caffer</i>	Sundevall's leaf-nosed bat	DD	Unlikely	Associated with caves
<i>Lemniscomys rosalia</i>	Single striped mouse	DD	Unlikely	Habitat inadequate
<i>Leptailurus serval</i>	Serval	NT	Unlikely	Habitat inadequate
<i>Lutra maculicollis</i>	Spotted-necked otter	NT	Unlikely	Habitat inadequate
<i>Manis temminckii</i>	Pangolin	VU	Unlikely	Habitat inadequate
<i>Mellivora capensis</i>	Honey badger	NT	Unlikely	Habitat inadequate
<i>Miniopterus schreibersii</i>	Schreiber's long fingered bat	NT	Unlikely	Associated with caves
<i>Myotis tricolor</i>	Temminck's bat	NT	Unlikely	Associated with caves
<i>Paracynictis selousi</i>	Selous' mongoose	DD	Unlikely	Habitat inadequate
<i>Pipistrellus rusticus</i>	Rusty bat	NT	Unlikely	Associated with rivers
<i>Poecilogale albiucha</i>	African weasel	DD	Unlikely	Habitat inadequate
<i>Rhinolophus blasii</i>	Peak saddle horseshoe bat	VU	Unlikely	Associated with caves
<i>Rhinolophus clivosus</i>	Geoffroy's horseshoe bat	NT	Possible	Habitat adequate
<i>Rhinolophus darlingii</i>	Darling's horseshoe bat	NT	Unlikely	Associated with caves
<i>Suncus infinitesimus</i>	Least dwarf shrew	DD	Unlikely	Associated with termitaria
<i>Suncus lixus</i>	Lesser dwarf shrew	DD	Unlikely	Habitat inadequate
<i>Tatera leucogaster</i>	Bushveld gerbil	DD	Unlikely	Habitat inadequate

NT=Near threatened; VU=Vulnerable; CR=Critically endangered; DD=Data deficient

The mobility of most mammals will ensure that they can adapt or relocate if disturbed by the activities. It is not anticipated that mammals will be significantly affected if mitigation measures are followed.

Invertebrate Report

Invertebrates - Excluding Butterfly families

Potentially, the natural habitats on site will offer refuge to all invertebrate groups with the available habitats on site. This consists of a large number of species for which field searches are too extensive to be accommodated for the present study. Picker *et. al.* (2002) can be referred to so as to get an idea of the large amount of invertebrate diversity that can be expected in the study area.

Butterflies

The habitats present have the potential to support approximately 275 species of butterflies. Cross-referenced larval host plants and prey items, a total of approximately 175 species may be present at one time or another. Due to the dynamic mobility of butterflies, any of these species has the potential to be present at a given time, although variable conditions will be a limiting factor. No Red Data Listed species are expected in the study area.

Pollinators

Pollinators provide an essential ecosystem service that result in the out-crossing and sexual reproduction of many plants. They benefit society by increasing food security in agricultural and natural ecosystem and they play an important role in conserving biological biodiversity (Eardly et al. 2006). Pollinator diversity includes an immense range of fauna, ranging from the tiniest invertebrates to relatively large vertebrates. Often, pollinators form part of a highly specific niche in pollinator-plant relationships and the ecosystem integrity as a whole. The loss of a single important habitat requirement (e.g. hides and cover objects, larval hosts, availability of water, etc.) for pollinators in an ecosystem could have far reaching effects, ultimately resulting in extinction. Fragmentation of habitats will undoubtedly also have a negative impact on the occurrence and distribution of pollinators and consequently on the genetic and population integrity of ecosystems. The successful survival of pollinators is thus further motivation for the conservation of undisturbed and unimpaired, interconnected ecological corridors crossing property boundaries in local areas.

7.1.5 *Aloe simii* Ecological Impact Assessment and Management

Results and Discussion of the Ecological Specialist Report (see Appendix E for the full report)

7.1.5.1 Extent of onsite distribution and condition of the population of the critically endangered species *Aloe simii*

This section will indicate the extent of the on-site distribution of the identified *Aloe simii* population on the proposed project site as well as the condition of their micro-habitat and current condition of individuals.

Number of individuals and their distribution extent

A small, isolated population of the Red Data Listed plant species *Aloe simii* (Status: Critically endangered) was discovered during the initial site visit conducted by Van der Walt in 2015. The population is located in the north-western portion of the proposed study area directly south of the existing homestead on site.

The individuals of the population were counted and all individuals were photographed during the follow up site visit of 13 September 2016 in order to record their locations and condition. Twenty one (21) individuals were positively identified during the site visit (see Appendix for figures). Due to their nature to grow in clusters, the different individual GPS coordinates could not be determined. However the outer extent of their distribution was verified and is illustrated in the distribution map below.



Figure 9: Distribution map indicating the extent of the distribution of the individuals of the *Aloe simii* population (see Appendix B for A 3 size)

Localised topography and drainage

The topography and elevation of the localised area slopes relatively steeply from the north-east downslope towards the south-west (see distribution map above). The majority of surface water runoff therefore occurs in this south-westerly direction and ultimately ends up in the White River. From the information received from the current landowners (whom have occupied the property for approximately 40 years) this steep topography has resulted in relatively intense surface water runoff events in the past and such runoffs still continue to occur on a frequent basis after rainfall events in the area.

The lack of adequate vegetation cover within the population's micro-habitat and subsequent lack of reduction in water runoff velocity and intensity poses a significant threat to the longevity of the *Aloe simii* population. Such strong runoff events could therefore potentially cause significant damage or even destruction and loss of individuals of the population if the issue of the unsuitably vegetated and unstable micro-habitat condition is not adequately addressed.

Condition of the micro-habitat and the individuals of the population

The micro-habitat within which the population is situated is in a highly degraded and ecologically unstable state (see Figures below). The habitat location is located in close proximity to the southern perimeter fencing of the existing homestead. For this reason the area has been constantly disturbed and degraded over time due to continual artificial management and maintenance of the vegetation through manual defoliation and uncontrolled anthropogenic movement/trampling through the area. As the property owners were never aware of the presence of the population, the negative impacts of the management practices on the micro-habitat and population could not have been foreseen.





Figure 10: Highly degraded and fragmented condition of the micro-habitat of the *Aloe simii* population

Uncontrolled, anthropogenically induced fires frequently occur in the area. These fires often occur during periods of the year when fire could damage the aloes. Although natural fires usually play an important role in the ecological functionality of the area and species, the effects of over frequent, uncontrolled burning have rather had a negative impact on the area and has further contributed to the degradation of the micro-habitat and community.

The majority of the individuals of the population are not in a healthy condition and rather seem to be struggling for survival due to the degraded condition of their micro-habitat. Several individuals have signs of physical damage and above ground biomass die-off is evident (see pictures in specialist report in Appendix E). The current withered state of the individuals of the population is mainly a result of the uncontrolled management practices on the micro-habitat as well as the other anthropogenic effects (fires and trampling) due to unrestricted access to the area.

The micro-habitat of the *Aloe simii* population is classified as having a **medium** sensitivity and significance rating. The medium rating refers to the transformed natural community which has a limited ecological function and a limited function for maintaining biodiversity. In this particular case it is mainly due to the negative effects of external anthropogenic impacts. External impacts must be managed and mitigated to reduce the significance of their effects.

The Present Ecological State (PES) of the micro-habitat within which the *Aloe simii* population is situated is classified as **largely modified**. This classification entails that a large loss of natural habitat, biota and basic ecosystem functions has occurred. This is also mainly due to the negative effects of external anthropogenic impacts. External impacts must be managed and mitigated to reduce the significance of their effects.

The Ecological Importance and Sensitivity (EIS) of the micro-habitat within which the *Aloe simii* population is situated is classified as **high**. This classification entails high ecological importance and sensitivity due to the restricted presence of the endangered species. Biodiversity may be sensitive to flow and habitat modifications. External impacts must be managed and mitigated to reduce the significance of their effects.

Conclusion

Due to the unstable, highly degraded condition of the micro-habitat, a passive conservation approach, which entails simply removing significant anthropogenic impacts will, unfortunately not succeed in significantly improving the condition of the micro-habitat. The habitat is also continually deteriorating and because of this, active intervention is needed and will have to be implemented in order to improve the current habitat condition. This will be the most suitable way in which the continued survival and hopefully successful reproduction of the *Aloe simii* population can be ensured. A habitat rehabilitation and restoration plan must be implemented in order to gradually and continually improve the ecological condition and functionality of the micro-habitat.

7.1.5.2 Role of the proposed development in the conservation of the *Aloe simii* population

The following measures with regards to the estate development project's role in the conservation and management of the *Aloe simii* population are proposed:

- The final design layout of the proposed estate must include an adequate physical buffer zone around the population.
- The developer must implement adequate rehabilitation, habitat restoration and continual maintenance measures in order to improve the ecological condition and functionality of the micro-habitat.

An adequate physical buffer around the population to be included into the final design layout of the proposed estate

Red List of South African Plants Buffer Guidelines

The guidelines incorporated into the Red List of South African Plants (Raimondo *et. al.*, 2009) prescribe the following important requirements with regards to conservation of critically endangered species:

- No further loss of natural habitat of this taxon should be permitted.
 - The current degraded and continually further deteriorating state of the micro-habitat is not representative of the composition and functionality of the desired pristine natural distribution habitat of the species. A virtually complete loss of the population's natural habitat has already taken place in the localised area and the development will therefore not contribute to a loss of any pristine natural habitat of the species. By implementing rehabilitation, habitat restoration and continual maintenance measures the development will in fact positively contribute to the improvement of the habitat.
- Sufficient space and a 200 m buffer must be implemented. The buffer must be sufficient to conserve pollinators and connectivity with natural vegetation on adjacent sites must be promoted.
 - The micro-habitat of the population and surrounding environment is already isolated and highly fragmented. The existing homestead is situated directly to the

north within 10 m of the population and beyond that, citrus orchards are present within 100 m isolating the habitat to the north. The natural habitat is also dissected and fragmented to the west by the presence of the R 40 main road within 60 m while rest of the remaining grassland area to the south and east of the population is also degraded and occupied by informal dirt tracks/roads and extensively infested by alien and invasive species. The presence of the population is therefore largely isolated within a small degraded micro-habitat area and an efficient 200 m natural buffer will not be viable.

Proposed buffer zone

A minimum 30 m buffer zone is proposed to be implemented around the western, southern and eastern boundaries of the population's distribution extent which will further extend 70 m – 80 m around the northern boundary (see map below) of their distribution extent. The proposed buffer area will be approximately 1.3 ha in surface size which should prove sufficient in allowing for remaining natural ecological processes to continue once rehabilitation and habitat restoration has occurred. This should subsequently ensure the sustainability of the population. The design of the proposed retirement estate will then accommodate and be developed outside the buffer zone (see map below).



Figure 11: Buffer map indicating the proposed buffer area to be implemented around the *Aloe simii* population (see Appendix B for A 3 size)

The 1.3 ha buffer area should provide sufficient natural surface area and buffer to enable pollinators such as sunbirds to readily visit the area during flowering season. The proposed buffer zone is located on the western boundary of the proposed development footprint and will therefore not be enclosed and isolated by the development but rather be open to the west in the direction of the R 40 main road. Only the entrance gate will be situated on the western boundary of the development which will provide access to the estate from the R 40 main road. Entrance gate infrastructure size and extent will be minimal and will not pose a significant obstacle in the anticipated flightpath corridor for sunbirds (pollinators) between the population and the existing other *Aloe simii* population situated across the R 40 main road. The design will therefore create a free flowing flight path/corridor for pollinators from the west. Sunbirds are also well adapted to urban conditions and should therefore not be significantly deterred from visiting the proposed buffer area and *Aloe simii* population.

By implementing rehabilitation and restoration measures and improving the habitat, pollinators can also be encouraged to visit the location of the population. The planting of other local indigenous species in the buffer zone which would attract sunbirds will assist to lure them to the buffer zone. The temporary implementation of sugar feeders could also further attract pollinator individuals to the location of the population during flowering periods.

The buffer zone must be properly fenced off to prevent any unauthorised access. Access to the buffered zone within which the population is located should be entirely restricted and only accessed for required vegetation management and maintenance purposes (this will be discussed later in the report). The buffer zone must be managed in such a way that natural ecological succession can take place to restore the *Aloe simii* site and buffer zone to a more stable and climatic natural condition.

Maintenance of natural surface water drainage

The natural surface water drainage which occurs from the north-eastern portion of the site needs to be maintained as far as possible to continue providing the current surface water runoff conditions required by the population. For this reason the proposed buffer zone is extended in that direction to between 70 m and 80 m. The proposed buffer zone will therefore extend to within close proximity of the edge of the existing citrus orchards to the north. This extension will ensure a large enough sub-catchment and surface water drainage area is maintained for the population. The demolition of the existing homestead as part of the proposed development plans will in fact result in an enlarged drainage area to provide water runoff to the population. The storm water management and drainage designs of the proposed estate layout should also allow for the adequate channelling and drainage of water on the southern boundary of the buffer zone in order for surface runoff not be significantly impeded and to prevent potential ponding. This will enable a degree of free drainage into the White River system.

Conclusion

By implementing a 30 m by 70 - 80 m (to the north) large buffer zone around the identified *Aloe simii* population, a buffered surface area of approximately 1.3 ha will be achieved. This buffer zone has been incorporated into the final proposed estate layout. This intervention along with the proposed mitigation and maintenance measures should prove sufficient in ensuring the sustainability and functionality of the micro-habitat and interaction with pollinators and will contribute to the

subsequent survival of the population. It will certainly ensure an improvement of the current degraded condition and instability of the micro-habitat.

The likelihood of survival of the population will therefore be higher if the development along with its proposed rehabilitation and mitigations is allowed to continue than if the area were left in its current unsuitable condition

Rehabilitation and habitat restoration measures

The main objective of rehabilitation and restoration of an area is to return it as far as reasonably/practicably possible to its original functional ecological state. In cases where the significance and duration of disturbance is relatively low, passive conservation interventions such as simple elimination/removal of external anthropogenic impacts can be used in order to enable the ecological condition of an area to naturally improve. However in cases where the threshold of ecological tolerance to disturbance has been crossed due to significant and continued disturbance, passive interventions will unfortunately not necessarily return an area to a desired state. In such cases, active physical rehabilitation interventions need to be introduced in order to attempt to reach the desired state.

It is the opinion of the specialist that the relevant ecological threshold has been crossed in the specific project area and that active intervention measures will have to be implemented during the rehabilitation of the habitat. The rehabilitation and restoration of the existing degraded micro-habitat within the proposed buffer zone will entail the following steps:

Pre-preparation for the rehabilitation and restoration process

- The fencing off of the buffered zone must be done to restrict access.
 - This must be in the form of minimum 1.8 m palisade/devils fork fence or another adequate form of barricading which will prevent unauthorised entry.
 - The access to the fenced off area must be restricted and regulated in order to prevent any unauthorised access to the population which could lead to accidental or intentional damage or destruction of species individuals. It will further also prevent potential illegal collection of *Aloe simii*.
 - Current management practices in the form of mowing or burning must immediately be ceased in order to enable current above ground biomass to start recovering.
- A suitable closely located natural area preferably in the vicinity of the second population present in the area across from the R 40 main road must be identified to serve as an ecological benchmark site for the restoration process.
 - This identified area must be representative of the natural habitat conditions which are normally associated with the *Aloe simii* species.
 - The area must be surveyed by an ecologist in order to obtain qualitative and quantitative species diversity data which will serve as a benchmark for comparison with the condition of the proposed buffer zone area.
- Collection of grass seed and shrubs for rehabilitation

- Important and dominant grass species present in the benchmark area must be identified by the ecologist and seeds of as many of the species as practically possible must be sourced from local seed distributors.
- Local harvesting of seed from the surrounding natural areas must also be done. A suitably qualified and experienced horticulturalist who is familiar with the specific area and grass species should be consulted to assist with the methodology and timing of the harvesting processes and the drying and storage processes.
- Important and dominant woody species present in the benchmark area must be identified by the ecologist and saplings of as many of the species as practically possible must be sourced from local nurseries. The required distribution densities of the woody component as per the benchmark site must also be indicated by the ecologist.
- Local indigenous plant species associated with sunbird pollination must also be sourced from local nurseries. This will aid in attracting required pollinators to the area. The horticulturalist must also assist in identifying such relevant species.
- An Alien and Invasive Species Management Plan must be developed and alien and invasive identification and removal training must be provided to relevant construction employees. This will equip them to adequately prevent and manage the establishment of undesired alien and invasive species on site during the demolition and construction phases.

Demolition of the existing homestead and rehabilitation of the footprint

- Prior the demolition of the existing homestead, the population must firstly be suitably barricaded/buffered and protected against potential damages during the demolition process.
 - A minimum 5m highly visible buffer must be placed around the distribution extent of the population. This buffer can be created with high visibility reflective shade netting which will prevent entry and 'no entry' signs must be placed on all sides of the barricaded area.
 - The buffer must prevent any construction machines or personnel from coming into any contact with the individuals of the population.
 - An adequate 1m high berm or cut off trench must be constructed between the buffer area and the demolition area to the north in order to channel dirty surface water runoff from the higher elevated demolition area around the location of the population. This will prevent any dirty surface water runoff from the demolition area of potentially coming into contact with the population and will prevent undesired contamination of the location of the population. This berm/trench will only be temporary for the duration of the demolition and re-shaping period.
- Once the demolition of the existing homestead has been completed, the surface area must be adequately rehabilitated and grassed.
 - Mechanical surface shaping of the area must be conducted in order to ensure that the final surface profile forms part of the natural surrounding water drainage network and allows for free flowing surface drainage that prevents potential ponding.
 - Soil preparation must then take place in the form of mechanically ripping the area to a depth of 500 mm in order to alleviate soil compaction and aerate the soils.

- Soil berms of approximately 300 mm high must be constructed at perpendicular angles to the slope gradient at 10 m intervals. This will break surface water runoff and reduce runoff speeds to prevent significant erosion and wash away of prepared soils.
- Soil samples representative of the area must be chemically and biologically analysed by an accredited laboratory in order to determine the amelioration requirements of the soil to create a suitable growth medium. The soil amelioration recommendations must be provided on the basis of the sample results by a suitably qualified and experienced agronomist.
- The demolition area must be manually fertilised based on the amelioration recommendations. Manual fertilisation will prevent any further unnecessary machine impacts on the area.
- The distributed fertilisers must be manually incorporated into the soil with garden forks to a depth of 100 mm. Manual incorporation will prevent any further unnecessary machine impacts on the area.
- Harvested and purchased grass seed must be mixed into a suitable ratio of pioneer and climax species as determined by the horticulturist and manually spread over the area at a seeding density as determined by the horticulturist.
- Seed must be manually incorporated to a depth of not more than 20 mm. This can be achieved by simply using tree branches to sweep over areas and ensure adequate soil-seed contact.
- Purchased shrubs and local indigenous plant species associated with sunbird pollination must be planted in the species mixtures and densities as determined by the horticulturist.
- Germination of seeds and development of the shrubs must then be monitored by an ecologist on a two-weekly basis for the first month after seeding in order to determine germination and establishment success. A monthly site inspection must then be conducted for the remainder of the first growing season.
- The establishment of alien and invasive species must also be monitored on the two-weekly basis for the first month after seeding and then monthly thereafter. Identified weeds must be manually removed and adequately disposed of at a suitable green-waste site. This must be done in accordance with the developed Alien and Invasive Species Management Plan.
- Once the vegetation has suitably established (expected period of 2 – 3 months), the 1 m high berm or cut off trench can be removed and its footprint also ameliorated and seeded. The smaller 300 mm berms can be left intact or also rehabilitated if desired.

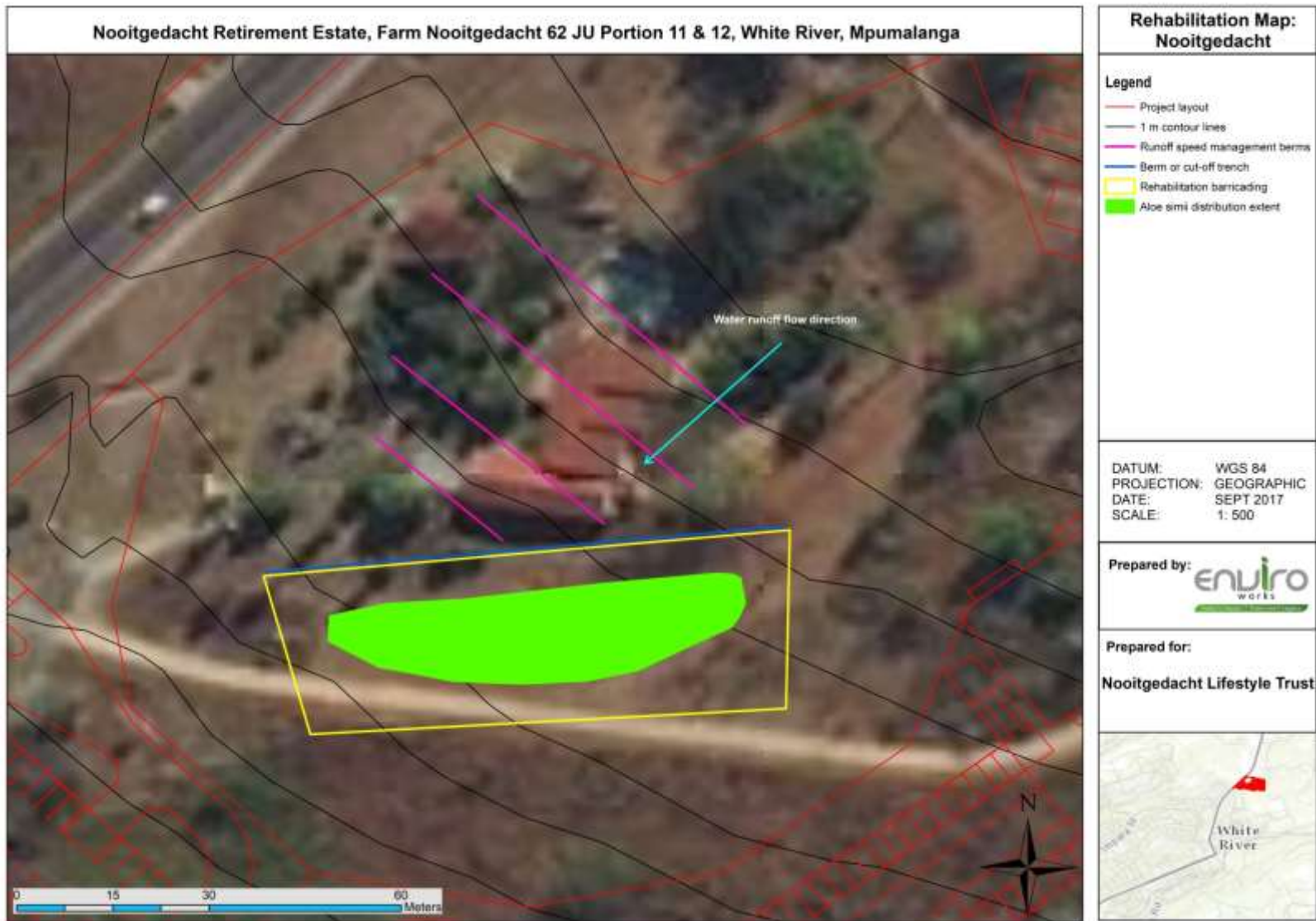


Figure 12: Existing homestead footprint rehabilitation map indicating the required barricading, cut-off trench and runoff management berms layout (see Appendix B for A 3 size)

- Initial annual maintenance of established vegetation on the demolition area must take place for a period of three years.
 - Vegetation must be manually defoliated after the first season of growth by slashing and leaving slashed material on site. By leaving the slashed material it will provide the soil the opportunity to start building up a seedbank and organic component.
 - Alien and invasive species must be manually removed and adequately disposed of at a suitable green-waste site on an annual basis. This must be done in accordance with the developed Alien and Invasive Species Management Plan.
 - Soil samples should be taken at the commencement of the second growing season and analysed at an accredited laboratory. Potential nutrient deficiencies must be identified from the analyses results by an agronomist and follow up top dress fertilisers must be applied manually if required.
 - Vegetation must be manually defoliated after the second season of growth by slashing and removing slashed material from site. The removal of material will prevent any potential smothering of established vegetation from occurring due to surface decomposition processes of cut materials. This will prevent aboveground grass material from potentially becoming moribund over time.
 - Final soil samples should be taken at the commencement of the third growing season and analysed at an accredited laboratory. Potential nutrient deficiencies must be identified from the analyses results by an agronomist and follow up top dress fertilisers must be applied manually if required.
 - Vegetation must be manually defoliated after the third season of growth by slashing and leaving slashed material on site. By leaving the slashed material it will provide the soil the opportunity to start building up a seedbank and organic component.
 - This will then conclude the initial rehabilitation and restoration process of the existing homestead footprint.

Rehabilitation of the remainder of the buffer zone footprint

- All initially significant alien and invasive species situated within the buffered zone need to be identified and actively removed either through physical or chemical intervention. Material must be adequately disposed of at a suitable green-waste site. This must be done in accordance with the developed Alien and Invasive Species Management Plan. The removal intervention must ensure that no further re-growth or seed distribution of such species occurs.
- A minimum 10m area around the distribution extent of the population must be actively rehabilitated and the habitat restored. This must take place concurrently with the rehabilitation of the existing homestead footprint after the demolition has been completed.
 - Soil preparation must take place in the form of manual loosening of the soil with garden forks to a depth of 100 mm in order to alleviate soil compaction. Soils must not be turned during loosening and the existing vegetation must not be removed. **The individuals of the population must be clearly marked for identification purposes. No manual loosening is allowed within 1 m of any of the individuals. This must be strictly managed during the soil preparation process.**
 - Soil samples representative of the area must be chemically and biologically analysed by an accredited laboratory in order to determine the amelioration requirements of

the soil to create a suitable growth medium. The soil amelioration recommendations must be provided on the basis of the sample results by a suitably qualified and experienced agronomist.

- The area must be manually fertilised based on the amelioration recommendations.
- The distributed fertilisers must be manually incorporated into the soil with garden forks to a depth of 100 mm. **Once again, no manual incorporation is allowed within 1 m of any of the individuals of the population. This must be strictly managed during the soil preparation process**
- Harvested and purchased grass seed must be mixed into a suitable ratio of pioneer and climax species as determined by the horticulturist and manually spread over the area at a seeding density as determined by the horticulturist.
- Seed must be manually incorporated to a depth of not more than 20 mm. This can be achieved by simply using tree branches to sweep over areas and ensure adequate soil-seed contact.
- Purchased shrubs and local indigenous plant species associated with sunbird pollination must be planted in the species mixtures and densities as determined by the horticulturist.
- Germination of seeds and development of the shrubs must then be monitored by an ecologist on a two-weekly basis for the first month after seeding in order to determine germination and establishment success. A monthly site inspection must then be conducted for the remainder of the first growing season.
- The establishment of alien and invasive species must also be monitored on the two-weekly basis for the first month after seeding and then monthly thereafter. Identified weeds must be manually removed and adequately disposed of at a suitable green-waste site. This must be done in accordance with the developed Alien and Invasive Species Management Plan.

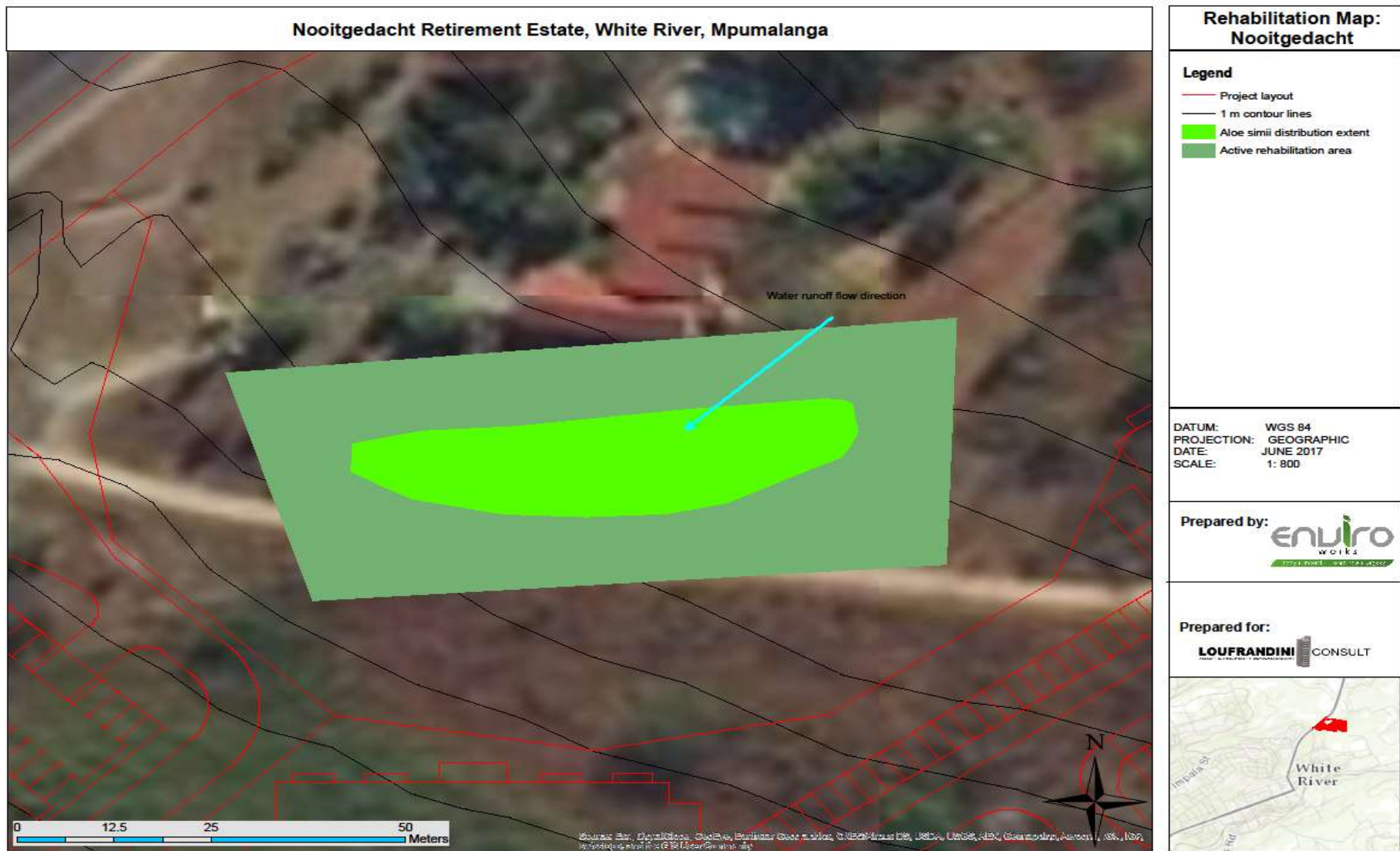


Figure 13: Rehabilitation map indicating the required area to be actively rehabilitated around the population location (see Appendix B for A 3 size)

- Initial annual maintenance of established vegetation on the area must take place for a period of three years. This must take place concurrently with the maintenance of the existing homestead footprint after the rehabilitation has been completed.
 - Vegetation must be manually defoliated after the first season of growth by slashing and leaving slashed material on site. By leaving the slashed material it will provide the soil the opportunity to start building up a seedbank and organic component. **The individuals of the population must be clearly marked for identification purposes. Manual slashing within 1 m of any of the individuals must not take place lower than 200 mm from the ground. Extreme care must be taken not to damage any individuals as this will constitute a contravention of the law and is criminally punishable. This must be strictly managed during the maintenance processes.**
 - Alien and invasive species must be manually removed and adequately disposed of at a suitable green-waste site on an annual basis. This must be done in accordance with the developed Alien and Invasive Species Management Plan.
 - Soil samples should be taken at the commencement of the second growing season and analysed at an accredited laboratory. Potential nutrient deficiencies must be identified from the analyses results by an agronomist and follow up top dress fertilisers must be applied manually if required.
 - Additional sugar feeders must be temporarily installed in close proximity to the individuals of the population at the commencement of the second flowering season. This will aid in the attraction of pollinators such as sunbirds. **It is important to note that NO artificial sweeteners such as xylitol should be used as these sweeteners are toxic to sunbirds.**
 - Vegetation must be manually defoliated after the second season of growth by slashing and removing slashed material from site. The removal of material will prevent any potential smothering of established vegetation from occurring due to surface decomposition processes of cut materials. This will prevent aboveground grass material from potentially becoming moribund over time.
 - Final soil samples should be taken at the commencement of the third growing season and analysed at an accredited laboratory. Potential nutrient deficiencies must be identified from the analyses results by an agronomist and follow up top dress fertilisers must be applied manually if required.
 - Vegetation must be manually defoliated after the third season of growth by slashing and leaving slashed material on site. By leaving the slashed material it will provide the soil the opportunity to start building up a seedbank and organic component.
 - This will then conclude the initial rehabilitation and restoration process of the immediate area surrounding the population.
- After removal of all alien and invasive species, the remainder of the buffer zone outside the active rehabilitation area will be left 'in situ' for the first growing season to allow for suitable passive recovery/re-growth and increase in above ground biomass of graminoids and other herbaceous species.
 - The remainder of the buffer zone outside the active rehabilitation area must be inspected by an ecologist at the end of the first growing season and then on an annual basis for the first three years concurrently with the rehabilitation maintenance of the homestead footprint. The ecologist must annually determine

whether defoliation through slashing and leaving of materials and alien and invasive species removal is required for the remainder of the buffer zone outside the active rehabilitation area.

Continued monitoring and maintenance of the buffer zone

- A suitably qualified and experienced horticulturalist who is familiar with the specific area and specific species *Aloe simii* must continue to conduct an annual assessment of the population to determine the condition and health of the individuals.
 - If any individuals are found to be suffering from potential pests or diseases they should be suitably treated whether by chemical or physical interventions. The horticulturalist must advise on the most appropriate intervention measures.
 - Care must be taken that the planting of indigenous ornamental vegetation within the proposed estate does not pose any potential health risk to the identified *Aloe simii* individuals such as scale lice infection.
- The horticulturalist must also continually determine on an annual basis whether defoliation, alien and invasive removal or any other management measures are required for the buffer zone. The recommended measures must then be implemented.

Harvesting of *Aloe simii* seed and propagation

It is highly recommended that the developer considers the opportunity of entering into a potential partnership with the Mpumalanga Tourism and Parks Association (MTPA) and a suitable local nursery to develop a programme for harvesting of required propagation materials from the localised populations in the White River area. No propagation material is available of the specific populations in the particular area. Individuals can then be propagated for re-planting initiatives by the local nursery in collaboration with the suitably qualified and experienced horticulturalist.

7.1.5.3 Conclusions and Recommendations

The implementation of the approximately 1.3 ha access restricted buffer zone along with the adequate rehabilitation, habitat restoration and maintenance of the micro-habitat within which the identified *Aloe simii* population is located will contribute positively in a significant manner towards the ensured sustainability and subsistence of the population. Ecological functionality and services of the micro-habitat will be maintained and in fact improved through the buffer zone and rehabilitation measures which will improve the likelihood of the subsistence and ultimately envisaged thriving of the *Aloe simii* population.

Mitigation, management and monitoring measures as recommended in the specialist report must be strictly adhered to and implemented during the construction as well as operational phases. This must be strictly regulated by the appointment of a suitably qualified and experienced independent Environmental Compliance Officer (ECO) who must conduct frequent environmental audits during the construction and rehabilitation phases.

It is therefore the opinion of the specialist that this proposed development may continue in the event that all mitigation measures and recommendations as per this report are adhered to as well as all necessary authorisations and permits are successfully obtained.

7.1.6 An adequate buffer distance required from the 1:100 year floodline of the White River

The southern boundary of the proposed development footprint is situated in close proximity to the identified 1:100 year flood line of the White River. A buffer recommendation to prevent development inside the 1:100 year flood line is required for the proposed estate.

Condition of habitat

From the visual observations made during the site visit as well as the information obtained from the original Ecological Impact Assessment (Van der Walt, 2015), it is evident that the White River is not in a healthy/pristine condition. Although the aquatic vegetation associated with the instream and surrounding riparian areas seem to be in a favourable climatic state of succession, large areas of algal blooms and pipes disposing of fluids directly into the river indicate that the water quality is being severely negatively affected by raw sewage and other undesired products. The instream vegetation is mostly dominated by *Phragmites australis* and *Typha capensis*.

The riparian zone and directly adjacent grassland transitional areas potentially serve as an important corridor for the adequate movement of faunal species. An adequate buffer between the riparian zone and proposed development boundary must therefore be implemented in order to maintain the integrity and efficiency of the important faunal corridor.

As one moves away from the riparian area, the grassland transitional zone however exerts significant signs of progressive degradation and decrease in biodiversity as is also evident in the adjacently situated degraded terrestrial grassland. The condition of this transitional zone is therefore only regarded as **medium** sensitivity while the riparian and instream zones are classified as **high** sensitivity as per the original Ecological Impact Assessment (Van der Walt, 2015).

The Present Ecological State (PES) of the grassland transitional zone is classified as **moderately modified** while the riparian zone is classified as **largely natural**.

The Ecological Importance and Sensitivity (EIS) of the grassland transitional zone is classified as **low/marginal** while the riparian zone is classified as **high**.

The ecological importance and value of the grassland transitional zone is therefore decreased and lower than would be expected due to its undesired degraded state.

Alien and Invasive weeds

The major encroaching weed species in the grassland transitional zone include *Nephrolepis sp.*, bamboo and to a lesser extent *Tecoma stans* while the riparian zone and instream water habitats are not as infested. The alien species *Morus nigra* and invasive *Ricinus communis* are however present in isolated stands on the banks and instream areas of the river.

Conclusion

It is important for the entire riparian zone to be preserved as a faunal corridor while the degraded transitional grassland zone would not necessarily play such a significant additional role or add significant benefit to faunal movement due to its degraded state.

A portion of the transitional zone should however also form part of the riparian buffer in order to widen the corridor and protect the riparian zone from impact of possible ecological 'edge effects'. A 2 m buffer outside the identified 1:100 year flood line will provide a riparian corridor area of suitable width which should prove sufficient for achieving the objective of adequate faunal movement and riparian zone preservation.



Figure 14: Flood line Map indicating the proposed buffer outside the 1:100 year flood line of the White River (see Appendix B for A 3 size)

The following recommendations should be considered:

- The design of the estate needs to ensure that a sufficient buffer area is established outside the identified riparian area.
 - No development is allowed within the identified 1:100 year flood line of the White River. Ensure that the development footprint stays a minimum of 2 m outside the identified 1:100 year flood line.
 - The 2 m buffer zone outside the 1:100 year flood line should be sufficient to allow for adequate free faunal movement between the identified riparian area and the proposed development footprint. A wider buffer is not deemed necessary as widening the buffer will simply move the corridor into the degraded transitional grassland areas and will therefore not pose a significantly increased benefit for biodiversity or faunal movement.
- Once the operational phase of the estate commences, management practices need to be implemented to ensure that no illegal dumping of waste by residents potentially occurs over the southern boundary walls into the established riparian buffer zone.
- A storm-water management plan needs to be implemented for the proposed estate in order to ensure adequate clean/dirty water separation between the estate and the surrounding natural landscape. This must and prevent undesired dirty water runoff from occurring into the surrounding natural landscape.
- Illegal upstream disposal of raw sewage and other waste products should be brought under the attention of the Mpumalanga Department of Environment and Nature Conservation in order for them to implement suitable intervention strategies to prevent the continued degradation of the White River's water quality.

7.1.7 Heritage Impact Assessment

Results and Discussion of the Heritage Specialist Report (see Appendix E for the full report)

A Phase 1 Heritage Impact Assessment (HIA) regarding archaeological and other cultural heritage resources was conducted on the footprint for the proposed Nooitgedacht Retirement Village, on portion 11 and 12 of the farm Nooitgedacht 62JU.

The National Heritage Resources Act, no 25 (1999) (NHRA), protects all heritage resources, which are classified as national estate. The NHRA stipulates that any person who intends to undertake a development, is subjected to the provisions of the Act.

The area for the proposed development is currently vacant land that extends down to the White River in the south. Historical Google Earth imagery (2004/2013) shows that most of the study area is situated on transformed agricultural lands. The area comprises largely of alien vegetation with small sections of indigenous bush.

A small graveyard was identified to the north-east of the study area. Mitigation measures are proposed. The survey revealed no other archaeological or historical features in the study area. Some ruins, an old bridge and road were identified during the survey but they are not older than 60 years and are of no significance. No archaeological material or features with heritage value were identified during the survey.

Based on the survey and the findings of the specialist report, the specialist states that there are no compelling reasons which may prevent the proposed development to continue if the mitigation measures for the small graveyard are adhered to.

7.2 SOCIO-ECONOMIC DESCRIPTION

The proposed project does not hold any overriding negative social impacts to suggest a no development option. The investment, employment and income generation potential linked to the project will positively contribute to the socio-economic development objectives described in the local IDP (as discussed under headings 3 & 5).

According to Census 2011 the Mbombela Local Municipality has a total population estimated at 588 794 with a growth rate of 2.11. Unemployment is 28.1 %. The establishment of the development will take approximately 3 years to complete and the construction phase will provide significant employment opportunities and the experience and skills involved in completing the establishment processes will provide valuable capacity building and skills development and transfer. Thirty individuals will also be permanently employed for the proposed development.

Construction and operational phase job creation (principle of local employment will be followed as far as practicably possible) and sustainable capacity building (skills, experience and resources development) of this project will aid in immediate and continuous local community upliftment and poverty alleviation and are therefore regarded as significant socio-economic benefits associated with the proposed project to motivate the need and desirability. As discussed in section 3, the outcomes of this project are also in line with the requirements and objectives of the National Development Plan and the Mbombela Local Municipality Spatial Development Framework.

8. PUBLIC PARTICIPATION PROCESS

A comprehensive Public Participation Process (PPP) will be undertaken with all stakeholders and Interested and Affected Parties (I & AP's), including the relevant Organs of State and competent authority as identified.

The PPP will be conducted in accordance with the requirements of Regulation 41 of the EIA Regulations, 2014 and the designated Public Participation Officer ensured that the PPP is facilitated in a manner which ensures reasonable opportunity for all stakeholders and registered I & AP's to comment and provide input on the proposed project.

- The Draft Basic Assessment Report will be completed and submitted to the competent authority on 16 October 2017 for comments. The competent authority acknowledgement of receipt letter will be included into the final PPP Report.
- An advertisement was placed in the NewsHorn and Low Velder newspaper on 27 September 2017. The NewsHorn is a free local newspaper distributed in the Mbombela Local Municipal area. The advertisement will provide details on the project and an invitation for the public to register an interest in the project. The advertisement also indicated the Public Participation Process commencement and closing dates as well as all the other necessary information required. Proof of advertisement will be included into the final PPP Report.
- Site notices were placed on 23 September 2017 at strategic, conspicuous and accessible locations in the vicinity of the proposed project area. Site Notices were also placed at the Municipal Building and Local White River Library. The site notices provide details on the project and an invitation for the public to register an interest in the project. The site notices also indicate that the Public Participation Process for the proposed project would commence on 27 September 2017 as well as all the other necessary information required. Proof of site notices will be included into the final PPP Report.
- One hardcopy of the draft Basic Assessment Report will be made available to the public for comment at the White River Library. Proof of hardcopies placement will be included into the final PPP Report.
- A hardcopy will be couriered to the competent authority on 16 October 2017
- A notification email will be sent to all the identified stakeholders, I & AP's and relevant organs of state on 16 October 2017. The email will provide details on the project and an invitation for all to register an interest in the project. The email will also indicate that the 30 day Public Participation Process for the proposed project commence as well as all the other necessary information required. Proof of email and delivery receipts will be included into the final PPP Report.

The Public Participation Process on the draft Basic Assessment Report will conclude on 9 November 2017. All comments received and responses provided during the PPP will be incorporated into the final PPP Report.

It is concluded that the level and time period of advertising, notification and additional mechanisms and communication incorporated into this Public Participation Process on the draft Basic Assessment Report, to inform surrounding land owner/users, stakeholders, I & AP's and identified organs of state, will be adequate for providing sufficient opportunity for participation and engagement.

See Appendix C for the Public Participation Information

9. ENVIRONMENTAL IMPACT ASSESSMENT

The following section identifies the potential environmental impacts (both positive and negative) which the construction as well as operational phases of the proposed project will have on the surrounding environment.

Once the potential environmental impacts are identified, they are assessed by rating their Environmental Risk after which the final Environmental Significance is calculated and rated for each identified environmental impact.

The same Environmental Risk rating process is then followed for each environmental impact to determine the Environmental Significance if the recommended mitigation measures were to be implemented.

The objective of this section is therefore firstly to identify all the potential environmental impacts of the proposed project and secondly to determine the significance of the impacts and how effective the recommended mitigation measures will be able to reduce their significance. The potential environmental impacts which are still rated as highly significant, even after implementation of mitigations, can then be identified in order to specifically focus on implement of effective management strategies for them.

9.1 METHODOLOGY FOR IMPACT ASSESSMENT AND RISK RATING

The tables below indicate and explain the methodology and criteria used for the evaluation of the Environmental Risk Ratings as well as the calculation of the final Environmental Significance Ratings of the identified potential environmental impacts.

Each potential environmental impact is scored for each of the Evaluation Components as per the table below.

Table 14: Scale utilised for the evaluation of the Environmental Risk Ratings

Evaluation Component	Rating Scale and Description/criteria
MAGNITUDE of NEGATIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high: Bio-physical and/or social functions and/or processes might be <i>severely</i> altered.</p> <p>8 - High: Bio-physical and/or social functions and/or processes might be <i>considerably</i> altered.</p> <p>6 - Medium: Bio-physical and/or social functions and/or processes might be <i>notably</i> altered.</p> <p>4 - Low : Bio-physical and/or social functions and/or processes might be <i>slightly</i> altered.</p> <p>2 - Very Low: Bio-physical and/or social functions and/or processes might be <i>negligibly</i> altered.</p> <p>0 - Zero: Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	<p>10 - Very high (positive): Bio-physical and/or social functions and/or processes might be <i>substantially</i> enhanced.</p> <p>8 - High (positive): Bio-physical and/or social functions and/or processes might be <i>considerably</i> enhanced.</p> <p>6 - Medium (positive): Bio-physical and/or social functions and/or processes might be <i>notably</i> enhanced.</p> <p>4 - Low (positive): Bio-physical and/or social functions and/or processes might be <i>slightly</i> enhanced.</p> <p>2 - Very Low (positive): Bio-physical and/or social functions and/or processes might be <i>negligibly</i> enhanced.</p> <p>0 - Zero (positive): Bio-physical and/or social functions and/or processes will remain <i>unaltered</i>.</p>
DURATION	5 - Permanent

Evaluation Component	Rating Scale and Description/criteria
	<p>4 - Long term: Impact ceases after operational phase/life of the activity > 60 years.</p> <p>3 - Medium term: Impact might occur during the operational phase/life of the activity – 60 years.</p> <p>2 - Short term: Impact might occur during the construction phase - < 3 years.</p> <p>1 - Immediate</p>
<p>EXTENT (or spatial scale/influence of impact)</p>	<p>5 - International: Beyond National boundaries.</p> <p>4 - National: Beyond Provincial boundaries and within National boundaries.</p> <p>3 - Regional: Beyond 5 km of the proposed development and within Provincial boundaries.</p> <p>2 - Local: Within 5 km of the proposed development.</p> <p>1 - Site-specific: On site or within 100 m of the site boundary.</p> <p>0 - None</p>
<p>IRREPLACEABLE loss of resources</p>	<p>5 – Definite loss of irreplaceable resources.</p> <p>4 – High potential for loss of irreplaceable resources.</p> <p>3 – Moderate potential for loss of irreplaceable resources.</p> <p>2 – Low potential for loss of irreplaceable resources.</p> <p>1 – Very low potential for loss of irreplaceable resources.</p> <p>0 - None</p>
<p>REVERSIBILITY of impact</p>	<p>5 – Impact cannot be reversed.</p> <p>4 – Low potential that impact might be reversed.</p> <p>3 – Moderate potential that impact might be reversed.</p> <p>2 – High potential that impact might be reversed.</p> <p>1 – Impact will be reversible.</p> <p>0 – No impact.</p>
<p>PROBABILITY (of occurrence)</p>	<p>5 - Definite: >95% chance of the potential impact occurring.</p> <p>4 - High probability: 75% - 95% chance of the potential impact occurring.</p> <p>3 - Medium probability: 25% - 75% chance of the potential impact occurring</p> <p>2 - Low probability: 5% - 25% chance of the potential impact occurring.</p> <p>1 - Improbable: <5% chance of the potential impact occurring.</p>

Evaluation Component	Rating Scale and Description/criteria
CUMULATIVE impacts	High: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern.
	Medium: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern.
	Low: The activity is localised and might have a negligible cumulative impact.
	None: No cumulative impact on the environment.

Once the Environmental Risk Ratings have been evaluated for each potential environmental impact, the Significance Score of each potential environmental impact is calculated by using the following formula:

- **SS (Significance Score) = (magnitude + duration + extent + irreplaceable + reversibility) x probability.**
The maximum Significance Score value is 150.

The Significance Score is then used to rate the Environmental Significance of each potential environmental impact as per Table 5 below. The Environmental Significance rating process is completed for all identified potential environmental impacts both before and after implementation of the recommended mitigation measures.

Table 15: Scale used for the evaluation of the Environmental Significance Ratings

Significance Score	Environmental Significance	Description/criteria
125 – 150	Very high (VH)	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	High (H)	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.
75 – 99	Medium-high (MH)	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked.
40 – 74	Medium (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	Low (L)	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

9.2 DESCRIPTION OF POTENTIAL IMPACTS AND THEIR RECOMMENDED MITIGATION MEASURES

The following section provides descriptions of the potential environmental impacts which the proposed project will have as well as the recommended mitigation measures to be implemented for each impact as identified during the Scoping phase.

9.2.1 Construction Phase

The potential environmental impacts associated with the construction phase of the proposed development.

Transformation of terrestrial grassland vegetation of the proposed project footprint area associated with the Legogote Sour Bushveld vegetation type (SVI 9)

The proposed development will in all probability completely transform the majority of the existing surface vegetation on the project footprint area. Although the Legogote Sour Bushveld vegetation type (SVI 9) is classified as having a vulnerable status in terms of the national threatened ecosystems map, the specific proposed project footprint area is situated within an area classified as 'heavily/moderately modified' and 'other natural areas' by the Provincial Spatial Biodiversity Plan. The area therefore does not fall within any Critical Biodiversity Areas (CBA) or Ecological Support Areas (ESA). The area also falls within the municipal urban edge and does not form part of any planned municipal open space areas. The proposed project area is mostly degraded and fragmented due to historic disturbance and transformation resulting from continued anthropogenic activities and the area therefore scored relatively low PES and EIS values. The project area is not viewed as being of high conservational significance for habitat preservation or ecological functionality persistence in support of the surrounding ecosystem or broader vegetation type. The significance of this potential impact on vegetation will therefore be medium.

Mitigation measures to reduce potential impacts:

- The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place.
- No site camp to be established outside the proposed development footprint.
- Adequately fence off the construction area and ensure that no construction activities, machines or equipment operate or impact outside the fenced off area.
- Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. No new roads or tracks to be constructed or implemented through any of the surrounding areas.

Destruction of the population of the critically endangered species *Aloe simii*

The earthworks associated with the development of the proposed estate will completely transform the surface vegetation and destroy the individuals of the identified *Aloe simii* population on the development footprint. If the population is however left 'in situ' without any active intervention, there is a high likelihood that the individuals will also be destroyed by means of uncontrolled external anthropogenic impacts. The significance of this potential impact will therefore be very high.

Mitigation measures to reduce potential impacts:

- Implement a minimum 30 m buffer zone around the western, southern and eastern boundaries of the population's distribution extent and an extended 70 m – 80 m buffer zone around the northern boundary of the population's distribution extent. The proposed buffer area will be approximately 1.3 ha in surface size.
- The buffer zone must be physically fenced off or another adequate form of barricading must be implemented around it. Access to within the buffered zone where the population is located should be entirely restricted.

Destruction of/damage to the micro-habitat of the *Aloe simii* population

The earthworks associated with the development of the proposed estate will completely transform the surface vegetation and destroy the micro-habitat within which the *Aloe simii* population is located on the development footprint. The current condition of the micro-habitat is however severely degraded and continually further deteriorating due to uncontrolled external anthropogenic impacts. The micro-habitat has also crossed threshold of ecological tolerance to disturbance and will not be able to adequately recover if left 'in situ' through mere passive conservation measures. The significance of this potential impact will therefore be very high. Active rehabilitation and restoration measures are required to adequately improve the condition of the micro-habitat.

Mitigation measures to reduce potential impacts:

- Implement a minimum 30 m buffer zone around the western, southern and eastern boundaries of population's distribution extent and an extended 70 m – 80 m buffer zone around the northern boundary of the population's distribution extent. The proposed buffer area will be approximately 1.3 ha in surface size.
- The buffer zone must be physically fenced off or another adequate form of barricading must be implemented around it. Access to within the buffered zone where the population is located should be entirely restricted.
- Implement active rehabilitation and habitat restoration measures in order to improve the condition and functionality of the buffered micro-habitat.
- An Alien and Invasive Species Management Plan must be developed and implemented in order to enable adequate management and prevention of significant weed establishment on the site during construction.

Alien invasive species establishment

The semi-natural areas within and around the proposed project footprint could potentially be prone to significant alien invasive species establishment due to disturbances caused by construction activities. Due to the isolated, degraded and transformed status of the areas surrounding the proposed project area, the significance of this potential impact will be low.

Mitigation measures to reduce potential impacts:

- Alien invasive vegetation material cleared during construction activities must be adequately disposed of at a suitable, certified 'green waste' disposal site in order to prevent further spreading.
- Implement suitable alien invasive species establishment prevention measures during the construction phase.
- Areas around the proposed project footprint must be adequately rehabilitated in accordance with the *Aloe simii* Ecological Impact Assessment Report recommendations to prevent significant alien invasive species establishment.

Surface material erosion

The semi-natural areas within and around the proposed project footprint could potentially be prone to significant surface soil erosion due to the loosening of materials and potential removal of vegetation during

construction which would usually bind the surface material. Due to the steep local topography, the risk of erosion is medium and the significance of this potential impact will be medium.

Mitigation measures to reduce potential impacts:

- Implement suitable erosion prevention measures during the construction phase.
- Areas around the proposed project footprint must be adequately rehabilitated in accordance with the *Aloe simii* Ecological Impact Assessment Report recommendations to prevent significant erosion.
- Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the construction and operational phases. This must be done to ensure that no significant contamination of the drainage line occurs.
 - Adequate management of stormwater runoff quality, quantities and flow speed will be required.

Dust generation and emissions

The activities associated with the proposed project construction phase could potentially result in significant fugitive dust emissions due to vegetation removal. This could spread into the surrounding areas but the significance of this potential impact will however be low.

Mitigation measures to reduce potential impacts:

- Implement suitable dust management and prevention measures during the construction phase.
- Areas around the proposed project footprint must be adequately rehabilitated in accordance with the *Aloe simii* Ecological Impact Assessment Report recommendations to prevent significant dust emissions.

Impeding of the White River flow regime

The proposed development will potentially impact negatively on the watercourse condition or impediment of the flow regime could occur if development occurs within the 1:100 year floodline. This will subsequently have a negative effect on the White River's continued ecological functionality and persistence. The significance of these potential impacts on the drainage line will therefore be medium-high.

Mitigation measures to reduce potential impacts:

- The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion in the surrounding areas may take place.
- An adequate buffer zone of approximately 2 m outside the 1:100 year floodline must be demarcated and implemented around the drainage line and no future development should occur within this zone.
- Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the construction and operational phases. This must be done to ensure that no significant contamination of the drainage line occurs.
 - Adequate management of stormwater runoff quality, quantities and flow speed will be required.
- A Water Use License Application (WULA) must be submitted to the Department of Water and Sanitation in accordance with the National Water Act (Act 36 of 1998).

Contamination of the White River and reduction of surface water quality

Dirty water runoff from the proposed project surface area during the construction phase could potentially move into the drainage line which could contaminate and negatively impact on the water quality. This will subsequently have a negative effect on the White River's continued ecological functionality and persistence. The significance of potential contamination of the drainage line will therefore be medium-high.

Mitigation measures to reduce potential impacts:

- An adequate buffer zone of approximately 2 m outside the 1:100 year floodline must be demarcated and implemented around the drainage line and no future development should occur within this zone.
- Implement suitable erosion prevention measures during the construction phase.
- Areas around the proposed project footprint must be adequately rehabilitated in accordance with the *Aloe simii* Ecological Impact Assessment Report recommendations to prevent significant erosion.
- Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the construction and operational phases. This must be done to ensure that no significant contamination of the drainage line occurs.
 - Adequate management of stormwater runoff quality, quantities and flow speed will be required.
- Water samples of the drainage line must be collected directly downstream of the proposed project area prior to commencement of the construction phase. The quality of these samples must be chemically and biologically analysed by an accredited laboratory in order to serve as baseline values for the drainage line water quality.
 - Subsequent water sample analyses of the drainage line must be continually conducted on a 6 month basis and compared with the baseline data.
 - If any contamination or reduction in water quality is determined, the competent authority must immediately be notified and the necessary steps must be followed by the project owner to locate and remediate the source of contamination as soon as practicably possible.
- A Water Use License Application (WULA) must be submitted to the Department of Water and Sanitation in accordance with the National Water Act (Act 36 of 1998).

Damage or destruction of the graveyard identified on site

The proposed development will in all probability completely transform the majority of the project footprint area. Although the small identified graveyard consisting of 5 unmarked graves falls outside the proposed development footprint, it must be conserved. The significance of potential impact on the graveyard will be low.

Mitigation measures to reduce potential impacts:

- The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place.
- The small graveyard is of high significance and should be fenced off. Access must be allowed to family members, and a buffer zone of at least 10 m should be left around the graveyard.
- If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM

Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Itumeleng Masiteng/Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required.

Job creation and capacity building (skills, experience and resources development)

The proposed project will result in the creation of a significant amount of employment opportunities during both the construction and operational phases. This will provide a financial advantage/benefit to members of the local community and is therefore seen as a positive local socio-economic impact associated with the project

Mitigation measures to reduce potential impacts:

- Ensure that the principle of local employment is applied as far as possible during the project.

9.2.2 Operational Phase

The potential environmental impacts associated with the operational phase of the proposed development.

Destruction of/damage to the population of the critically endangered species *Aloe simii*

The operational phase of the proposed development could potentially cause damage to the population if the buffer zone is not adequately maintained and management and maintenance processes are neglected. The significance of this potential impact will therefore be very high.

Mitigation measures to reduce potential impacts:

- Adequately manage and maintain the buffer zone in accordance with the *Aloe simii* Ecological Impact Assessment recommendations.

Prevention/deterrence of pollinators to visit the *Aloe simii* population for pollination

Isolation of the population through the proposed estate development could potentially impede the flight path corridors of pollinators such as sunbirds and deter them from visiting the area where the population is located.

Mitigation measures to reduce potential impacts:

- Adequately manage and maintain the buffer zone in accordance with the *Aloe simii* Ecological Impact Assessment recommendations. This should provide a sufficient undisturbed area for pollinators to visit.
- The proposed buffer zone is located on the western boundary of the proposed development footprint and will therefore not be enclosed and isolated by the development but rather be open to the west in the direction of the R 40 main road. Only the entrance gate will be situated on the western boundary of the development which will provide access to the estate from the R 40 main road. Entrance gate infrastructure size and extent will be minimal and will not pose a significant obstacle in the anticipated flightpath corridor for sunbirds (pollinators) between the population and the existing other *Aloe simii*

population situated across the R 40 main road. The design will therefore create a free flowing flight path/corridor for pollinators from the west.

- Implement active rehabilitation and habitat restoration measures in order to improve the condition and functionality of the buffered micro-habitat. Planting of local indigenous plant species associated with sunbird pollination should encourage the pollinators to visit the area.
- Install temporary sugar feeders in close proximity to the population in order to further encourage pollinators to visit the area during flowering season. It is important to note that NO artificial sweeteners such as xylitol should be used as these sweeteners are toxic to sunbirds.

Impeding of the natural surface water catchment and drainage area

The natural surface topography of the localised area moves from a higher elevation in the north-east towards a lower elevation in the south-west. Natural surface water runoff and drainage therefore occurs in this direction which provides required water to the micro-habitat of the *Aloe simii* population. The proposed project development will isolate the micro-habitat on its north-eastern edge and subsequently impede any significant surface water runoff from reaching the population. This would result in the population not receiving sufficient water supply and could highly likely lead to the demise of the population.

Mitigation measures to reduce potential impacts:

- The buffer zone will be extended to between 70 m – 80 m on the north-western boundary of the population. This will result in the majority of the current exiting surface runoff and drainage area being included in the buffer zone and kept intact.
- The rehabilitation and restoration of the micro-habitat will also aid in improved, more controlled and less volatile surface water runoff occurring which could potentially damage the population.

Destruction of/damage to the micro-habitat of the *Aloe simii* population

The operational phase of the proposed development could potentially cause damage to the habitat inside the buffer zone if it is not adequately maintained and management and maintenance processes are neglected. The significance of this potential impact will therefore be very high.

Mitigation measures to reduce potential impacts:

- Adequately manage and maintain the buffer zone in accordance with the *Aloe simii* Ecological Impact Assessment recommendations.

Alien invasive species establishment

The buffer zone could potentially be prone to significant alien invasive species establishment if it is not adequately maintained and management and maintenance processes are neglected. The significance of this potential impact will be medium.

Mitigation measures to reduce potential impacts:

- Adequately manage and maintain the buffer zone in accordance with the *Aloe simii* Ecological Impact Assessment recommendations.
- Implement suitable alien invasive species establishment prevention measures during the construction phase.

Surface material erosion

The buffer zone could potentially be prone to significant surface soil erosion due to the steep local topography, if it is not adequately maintained and management and maintenance processes are neglected. The significance of this potential impact will be medium.

Mitigation measures to reduce potential impacts:

- Adequately manage and maintain the buffer zone in accordance with the *Aloe simii* Ecological Impact Assessment recommendations.
- Implement suitable erosion prevention measures during the construction phase.
- Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the operational phase. This must be done to ensure that no significant contamination of the drainage line occurs.
 - Adequate management of stormwater runoff quality, quantities and flow speed will be required.

Contamination of the White River and reduction of surface water quality

Dirty water runoff from the proposed project surface area during the operational phase could potentially move into the drainage line which could contaminate and negatively impact on the water quality. This will subsequently have a negative effect on the White River's continued ecological functionality and persistence. The significance of potential contamination of the drainage line will therefore be medium-high.

Mitigation measures to reduce potential impacts:

- Adequately manage and maintain the 1:100 year floodline buffer zone in accordance with the *Aloe simii* Ecological Impact Assessment recommendations.
- Implement suitable erosion prevention measures during the operational phase.
- Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the operational phases. This must be done to ensure that no significant contamination of the drainage line occurs.
 - Adequate management of stormwater runoff quality, quantities and flow speed will be required.
- Water sample analyses of the drainage line must be continually conducted on a 6 month basis and compared with the baseline data.
 - If any contamination or reduction in water quality is determined, the competent authority must immediately be notified and the necessary steps must be followed by the project owner to locate and remediate the source of contamination as soon as practicably possible.

Damage or destruction of the graveyard identified on site

The operational phase of the proposed development could potentially cause damage to the small identified graveyard if the buffer zone is not adequately maintained and management and maintenance processes are neglected. The significance of potential impact on the graveyard will be low.

Mitigation measures to reduce potential impacts:

- Adequately manage and maintain the buffer zone implemented around the graveyard.

Continued job creation and capacity building (skills, experience and resources development)

Permanent job creation during the operational phase will be considerably lower than for the initial construction phase. It will however still provide a positive economic input/financial benefit into the local community and is therefore seen as a positive local socio-economic impact associated with the project.

Mitigation measures to reduce potential impacts:

- Ensure that the principle of local employment is applied as far as possible during the project.

9.2.3 Cumulative Impacts

The proposed development will in all probability completely transform the majority of the existing surface vegetation on the project footprint area. Although the proposed project area and surrounding areas are mostly already degraded due to historic disturbance and transformation resulting from continued anthropogenic activities, the Legogote Sour Bushveld vegetation type (SVI 9) is still classified as having a vulnerable status in terms of the national threatened ecosystems map.

The current state and functionality of the micro-habitat within which the *Aloe simii* population is located is highly degraded and continually further deteriorating due to external anthropogenic impacts. The implementation of the access restricted buffer zone and rehabilitation and habitat restoration measures as suggested in this document will therefore in fact contribute positively towards the cumulative conservation of the natural habitat of the species and subsequent conservation and subsistence of the species itself.

9.3 RISK RATINGS OF POTENTIAL IMPACTS

The following section provides the Environmental Risk as well as the Environmental Significance Ratings for the potential environmental impacts for the proposed project both before and after implementation of the recommended mitigation measures.

9.3.1 Construction Phase

Table 16: Environmental Risk and Significance Ratings for the Construction Phase

Identified Environmental Impacts	Transformation of terrestrial grassland vegetation of the proposed project footprint area associated with the Legogote Sour Bushveld vegetation type (SVI 9)	
	1	2
Proposed project layout alternative		
Magnitude of Impact	Medium (6)	Medium (6)
Duration of impact:	Long term (4)	Long term (4)
Extent of the impact	Local (2)	Local (2)
Degree to which local resources are irreplaceable	Moderate (3)	Moderate (3)
Degree to which the impact can be reversed:	Moderate (3)	Moderate (3)
Probability of occurrence:	High probability (4)	High probability (4)
Cumulative impact prior to mitigation:	Medium	Medium
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (72)	Medium (72)
Proposed mitigation:	The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and	The project construction footprint must be kept as small as practicably possible to reduce the

	<p>no unnecessary/unauthorised footprint expansion into the surrounding areas may take place.</p>	<p>actual surface impact on vegetation and no unnecessary/unauthorised</p>
	<p>No site camp to be established outside the proposed development footprint.</p>	<p>footprint expansion into the surrounding areas may take place.</p>
	<p>Adequately fence off the construction area and ensure that no construction activities, machines or equipment operate or impact outside the fenced off area.</p>	<p>No site camp to be established outside the proposed development footprint.</p>
	<p>Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. No new roads or tracks to be constructed or implemented through any of the surrounding areas.</p>	<p>Adequately fence off the construction area and ensure that no construction activities, machines or equipment operate or impact outside the fenced off area.</p>
	<p>Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. No new roads or tracks to be constructed or implemented through any of the surrounding areas.</p>	<p>Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. No new roads or</p>
	<p>Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. No new roads or</p>	<p>Existing roads and farm tracks in close proximity to the proposed project area must be used during construction. No new roads or</p>



		tracks to be constructed or implemented through any of the surrounding areas.
Cumulative impact post mitigation:	Medium	Medium
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (51)	Medium (51)
Identified Environmental Impacts		
	Destruction of the population of the critically endangered species <i>Aloe simii</i>	
Proposed project layout alternative	1	2
Magnitude of Impact	Very High (10)	Very High (10)
Duration of impact:	Permanent (5)	Permanent (5)
Extent of the impact	Site specific (1)	Site specific (1)
Degree to which local resources are irreplaceable	Definite (5)	Definite (5)
Degree to which the impact can be reversed:	Impact cannot be reversed (5)	Impact cannot be reversed (5)
Probability of occurrence:	Definite (5)	Definite (5)
Cumulative impact prior to mitigation:	Very High	Very High

Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Very High (130)	Very High (130)
Proposed mitigation:	<p>Implement a minimum 30 m buffer zone around the western, southern and eastern boundaries of the population’s distribution extent and an extended 70 m – 80 m buffer zone around the northern boundary of the population’s distribution extent. The proposed buffer area will be approximately 1.3 ha in surface size.</p> <p>The buffer zone must be physically fenced off or another adequate form of barricading must be implemented around it. Access to within the buffered zone where the population is located should be entirely restricted.</p>	Layout Alternative 1 (preferred) is recommended
Cumulative impact post mitigation:	Positive	Very High
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Positive (+24)	Very High (130)



Identified Environmental Impacts	Destruction/damage to the micro-habitat of the <i>Aloe simii</i> population	
	1	2
Proposed project layout alternative		
Magnitude of Impact	Very High (10)	Very High (10)
Duration of impact:	Permanent (5)	Permanent (5)
Extent of the impact	Site specific (1)	Site specific (1)
Degree to which local resources are irreplaceable	Definite (5)	Definite (5)
Degree to which the impact can be reversed:	Impact cannot be reversed (5)	Impact cannot be reversed (5)
Probability of occurrence:	Definite (5)	Definite (5)
Cumulative impact prior to mitigation:	Very High	Very High
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Very High (130)	Very High (130)
Proposed mitigation:	Implement a minimum 30 m buffer zone around the western, southern and eastern boundaries of population's distribution extent and an extended 70 m – 80 m buffer zone around the northern boundary of the population's distribution extent. The	Layout Alternative 1 (preferred) is recommended

	<p>proposed buffer area will be approximately 1.3 ha in surface size.</p> <p>The buffer zone must be physically fenced off or another adequate form of barricading must be implemented around it. Access to within the buffered zone where the population is located should be entirely restricted.</p> <p>Implement active rehabilitation and habitat restoration measures in order to improve the condition and functionality of the buffered micro-habitat.</p> <p>An Alien and Invasive Species Management Plan must be developed and implemented in order to enable adequate management and prevention of significant weed establishment on the site during construction.</p>	
Cumulative impact post mitigation:	Positive	Very High
Significance rating of impact after mitigation	Positive (+24)	Very High (130)



(Low, Medium, Medium-High, High, or Very-High)		
Identified Environmental Impacts	Alien invasive species establishment	
Proposed project layout alternative	1	2
Magnitude of Impact	Low (4)	Low (4)
Duration of impact:	Medium term (3)	Medium term (3)
Extent of the impact	Local (2)	Local (2)
Degree to which local resources are irreplaceable	Low (2)	Low (2)
Degree to which the impact can be reversed:	High (2)	High (2)
Probability of occurrence:	Medium probability (3)	Medium probability (3)
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (39)	Low (39)
Proposed mitigation:	Alien invasive vegetation material cleared during construction activities must be adequately disposed of at a suitable, certified 'green waste' disposal site in order to prevent	Alien invasive vegetation material cleared during construction activities must be adequately disposed of at a suitable, certified



	<p>further spreading.</p> <p>Implement suitable alien invasive species establishment prevention measures during the construction phase.</p> <p>Areas around the proposed project footprint must be adequately rehabilitated in accordance with the <i>Aloe simii</i> Ecological Impact Assessment Report recommendations to prevent significant alien invasive species establishment.</p>	<p>‘green waste’ disposal site in order to prevent further spreading.</p> <p>Implement suitable alien invasive species establishment prevention measures during the construction phase.</p> <p>Areas around the proposed project footprint must be adequately rehabilitated in accordance with the <i>Aloe simii</i> Ecological Impact Assessment Report recommendations to prevent significant alien invasive species establishment.</p>
Cumulative impact post mitigation:	Low	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (26)	Low (26)



Identified Environmental Impacts	Surface material erosion	
	1	2
Proposed project layout alternative		
Magnitude of Impact	Medium (6)	Medium (6)
Duration of impact:	Short term (2)	Short term (2)
Extent of the impact	Site specific (1)	Site specific (1)
Degree to which local resources are irreplaceable	Moderate (3)	Moderate (3)
Degree to which the impact can be reversed:	High (2)	High (2)
Probability of occurrence:	Medium probability (3)	Medium probability (3)
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (42)	Medium (42)
Proposed mitigation:	<p>Implement suitable erosion prevention measures during the construction phase.</p> <p>Areas around the proposed project footprint must be adequately rehabilitated in accordance with the <i>Aloe simii</i> Ecological</p>	<p>Implement suitable erosion prevention measures during the construction phase.</p> <p>Areas around the proposed project footprint must be</p>

	<p>Impact Assessment Report recommendations to prevent significant erosion.</p> <p>Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the construction and operational phases. This must be done to ensure that no significant contamination of the drainage line occurs.</p> <p>Adequate management of stormwater runoff quality, quantities and flow speed will be required.</p>	<p>adequately rehabilitated in accordance with the <i>Aloe simii</i> Ecological Impact Assessment Report recommendations to prevent significant erosion.</p> <p>Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the construction and operational phases. This must be done to ensure that no significant contamination of the drainage line occurs.</p> <p>Adequate management of stormwater runoff quality, quantities and flow speed will be required.</p>
<p>Cumulative impact post mitigation:</p>	<p>Low</p>	<p>Low</p>



Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (14)	Low (14)
Identified Environmental Impacts	Dust generation and emissions	
Proposed project layout alternative	1	2
Magnitude of Impact	Very Low (2)	Very Low (2)
Duration of impact:	Short term (2)	Short term (2)
Extent of the impact	Local (2)	Local (2)
Degree to which local resources are irreplaceable	Very low (1)	Very low (1)
Degree to which the impact can be reversed:	High (2)	High (2)
Probability of occurrence:	Medium probability (3)	Medium probability (3)
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (27)	Low (27)
Proposed mitigation:	Implement suitable dust management and prevention measures during the construction phase.	Implement suitable dust management and prevention measures during the construction phase.

	Areas around the proposed project footprint must be adequately rehabilitated in accordance with the <i>Aloe simii</i> Ecological Impact Assessment Report recommendations to prevent significant dust emissions.	phase. Areas around the proposed project footprint must be adequately rehabilitated in accordance with the <i>Aloe simii</i> Ecological Impact Assessment Report recommendations to prevent significant dust emissions.
Cumulative impact post mitigation:	Low	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (18)	Low (18)
Identified Environmental Impacts		
	Impeding of the White River flow regime	
Proposed project layout alternative	1	2
Magnitude of Impact	Medium (6)	Medium (6)
Duration of impact:	Long term (4)	Long term (4)
Extent of the impact	Regional (3)	Regional (3)

Degree to which local resources are irreplaceable	Moderate (3)	Moderate (3)
Degree to which the impact can be reversed:	Moderate (3)	Moderate (3)
Probability of occurrence:	High probability (4)	High probability (4)
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium-High (76)	Medium-High (76)
Proposed mitigation:	<p>The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion in the surrounding areas may take place.</p> <p>An adequate buffer zone of approximately 2 m outside the 1:100 year floodline must be demarcated and implemented around the drainage line and no future development should occur within this zone.</p> <p>Adequate storm water management measures</p>	<p>The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion in the surrounding areas may take place.</p> <p>An adequate buffer zone of approximately 2 m outside the 1:100 year floodline must be demarcated and implemented</p>



	<p>must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the construction and operational phases. This must be done to ensure that no significant contamination of the drainage line occurs.</p> <p>Adequate management of stormwater runoff quality, quantities and flow speed will be required.</p> <p>A Water Use License Application (WULA) must be submitted to the Department of Water and Sanitation in accordance with the National Water Act (Act 36 of 1998).</p>	<p>around the drainage line and no future development should occur within this zone.</p> <p>Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the construction and operational phases. This must be done to ensure that no significant contamination of the drainage line occurs.</p> <p>Adequate management of stormwater runoff quality, quantities and flow speed will be required.</p> <p>A Water Use License Application (WULA) must be submitted to the</p>
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		Department of Water and Sanitation in accordance with the National Water Act (Act 36 of 1998).
Cumulative impact post mitigation:	Low	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (38)	Low (38)
Identified Environmental Impacts	Contamination of the White River and reduction of surface water quality	
Proposed project layout alternative	1	2
Magnitude of Impact	Medium (6)	Medium (6)
Duration of impact:	Long term (4)	Long term (4)
Extent of the impact	Regional (3)	Regional (3)
Degree to which local resources are irreplaceable	Moderate (3)	Moderate (3)
Degree to which the impact can be reversed:	Moderate (3)	Moderate (3)
Probability of occurrence:	High probability (4)	High probability (4)
Cumulative impact prior to mitigation:	Low	Low

Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium-High (76)	Medium-High (76)
<p>Proposed mitigation:</p>	<p>An adequate buffer zone of approximately 2 m outside the 1:100 year floodline must be demarcated and implemented around the drainage line and no future development should occur within this zone.</p> <p>Implement suitable erosion prevention measures during the construction phase.</p> <p>Areas around the proposed project footprint must be adequately rehabilitated in accordance with the Aloe simii Ecological Impact Assessment Report recommendations to prevent significant erosion.</p> <p>Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the construction and operational phases. This must be done to</p>	<p>An adequate buffer zone of approximately 2 m outside the 1:100 year floodline must be demarcated and implemented around the drainage line and no future development should occur within this zone.</p> <p>Implement suitable erosion prevention measures during the construction phase.</p> <p>Areas around the proposed project footprint must be adequately rehabilitated in accordance with the Aloe simii Ecological Impact Assessment Report recommendations to prevent significant erosion.</p>



	<p>ensure that no significant contamination of the drainage line occurs.</p> <p>Adequate management of stormwater runoff quality, quantities and flow speed will be required.</p> <p>Water samples of the drainage line must be collected directly downstream of the proposed project area prior to commencement of the construction phase. The quality of these samples must be chemically and biologically analysed by an accredited laboratory in order to serve as baseline values for the drainage line water quality.</p> <p>Subsequent water sample analyses of the drainage line must be continually conducted on a 6 month basis and compared with the baseline data.</p> <p>If any contamination or reduction in water quality is determined, the competent authority must</p>	<p>Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the construction and operational phases. This must be done to ensure that no significant contamination of the drainage line occurs.</p> <p>Adequate management of stormwater runoff quality, quantities and flow speed will be required.</p> <p>Water samples of the drainage line must be collected directly downstream of the proposed project area prior to commencement of the construction phase. The quality of these samples must be chemically</p>
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	<p>immediately be notified and the necessary steps must be followed by the project owner to locate and remediate the source of contamination as soon as practicably possible.</p> <p>A Water Use License Application (WULA) must be submitted to the Department of Water and Sanitation in accordance with the National Water Act (Act 36 of 1998).</p>	<p>and biologically analysed by an accredited laboratory in order to serve as baseline values for the drainage line water quality.</p> <p>Subsequent water sample analyses of the drainage line must be continually conducted on a 6 month basis and compared with the baseline data.</p> <p>If any contamination or reduction in water quality is determined, the competent authority must immediately be notified and the necessary steps must be followed by the project owner to locate and remediate the source of contamination as soon as practicably possible.</p> <p>A Water Use License Application (WULA) must be submitted to the Department of Water and</p>
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		Sanitation in accordance with the National Water Act (Act 36 of 1998).
Cumulative impact post mitigation:	Low	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (38)	Low (38)
Identified Environmental Impacts	Damage or destruction of the graveyard identified on site	
Proposed project layout alternative	1	2
Magnitude of Impact	Medium (6)	Medium (6)
Duration of impact:	Long term (4)	Long term (4)
Extent of the impact	Site specific (1)	Site specific (1)
Degree to which local resources are irreplaceable	High (4)	High (4)
Degree to which the impact can be reversed:	Moderate (3)	Moderate (3)
Probability of occurrence:	Low probability (2)	Low probability (2)
Cumulative impact prior to mitigation:	Low	Low

Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (36)	Low (36)
<p>Proposed mitigation:</p>	<p>The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place.</p> <p>The small graveyard is of high significance and should be fenced off. Access must be allowed to family members, and a buffer zone of at least 10 m should be left around the graveyard.</p> <p>If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA</p>	<p>The project construction footprint must be kept as small as practicably possible to reduce the actual surface impact on vegetation and no unnecessary/unauthorised footprint expansion into the surrounding areas may take place.</p> <p>The small graveyard is of high significance and should be fenced off. Access must be allowed to family members, and a buffer zone of at least 10 m should be left around the graveyard.</p> <p>If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures,</p>



	<p>APM Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Itumeleng Masiteng/Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required.</p>	<p>indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/John Gribble 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Itumeleng Masiteng/Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or</p>
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		palaeontological significance, a Phase 2 rescue operation may be required.
Cumulative impact post mitigation:	Low	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (18)	Low (18)
Identified Environmental Impacts		
	Job creation and capacity building (skills, experience and resources development)	
Proposed project layout alternative	1	2
Magnitude of Impact	High (8)	High (8)
Duration of impact:	Medium term (3)	Medium term (3)
Extent of the impact	Regional (3)	Regional (3)
Degree to which local resources are irreplaceable	None (0)	None (0)
Degree to which the impact can be reversed:	0	0
Probability of occurrence:	High probability (4)	High probability (4)
Cumulative impact prior to mitigation:	Positive	Positive

Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Positive (+ 56)	Positive (+ 56)
Proposed mitigation:	Ensure that the principle of local employment is applied as far as possible during the project.	Ensure that the principle of local employment is applied as far as possible during the project.
Cumulative impact post mitigation:	Positive	Positive
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Positive (+ 56)	Positive (+ 56)



9.3.2 Operational Phase

Table 17: Environmental Risk and Significance Ratings for the Operational Phase

Identified Environmental Impacts	Destruction of the population of the critically endangered species <i>Aloe simii</i>	
	1	2
Proposed project layout alternative		
Magnitude of Impact	Very High (10)	Very High (10)
Duration of impact:	Permanent (5)	Permanent (5)
Extent of the impact	Site specific (1)	Site specific (1)
Degree to which local resources are irreplaceable	Definite (5)	Definite (5)
Degree to which the impact can be reversed:	Impact cannot be reversed (5)	Impact cannot be reversed (5)
Probability of occurrence:	Definite (5)	Definite (5)
Cumulative impact prior to mitigation:	Very High	Very High
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Very High (130)	Very High (130)
Proposed mitigation:	Adequately manage and maintain the buffer zone in accordance with the <i>Aloe simii</i> Ecological Impact Assessment recommendations.	Layout Alternative 1 (preferred) is recommended

Cumulative impact post mitigation:	Positive	Very High
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Positive (+24)	Very High (130)
Identified Environmental Impacts		
	Prevention/deterrence of pollinators to visit the <i>Aloe simii</i> population for pollination	
Proposed project layout alternative	1	2
Magnitude of Impact	Medium (6)	Medium (6)
Duration of impact:	Long term (4)	Long term (4)
Extent of the impact	Local (2)	Local (2)
Degree to which local resources are irreplaceable	High (4)	High (4)
Degree to which the impact can be reversed:	Moderate (3)	Moderate (3)
Probability of occurrence:	High probability (4)	High probability (4)
Cumulative impact prior to mitigation:	Medium High	Medium High
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium High (76)	Medium High (76)

<p>Proposed mitigation:</p>	<p>Adequately manage and maintain the buffer zone in accordance with the <i>Aloe simii</i> Ecological Impact Assessment recommendations. This should provide a sufficient undisturbed area for pollinators to visit.</p> <p>The proposed buffer zone is located on the western boundary of the proposed development footprint and will therefore not be enclosed and isolated by the development but rather be open to the west in the direction of the R 40 main road. Only the entrance gate will be situated on the western boundary of the development which will provide access to the estate from the R 40 main road. Entrance gate infrastructure size and extent will be minimal and will not pose a significant obstacle in the anticipated flightpath corridor for sunbirds (pollinators) between the population and the existing other <i>Aloe simii</i> population situated across</p>	<p>Layout Alternative 1 (preferred) is recommended</p>
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	<p>the R 40 main road. The design will therefore create a free flowing flight path/corridor for pollinators from the west.</p> <p>Implement active rehabilitation and habitat restoration measures in order to improve the condition and functionality of the buffered micro-habitat. Planting of local indigenous plant species associated with sunbird pollination should encourage the pollinators to visit the area.</p> <p>Install temporary sugar feeders in close proximity to the population in order to further encourage pollinators to visit the area during flowering season. It is important to note that NO artificial sweeteners such as xylitol should be used as these sweeteners are toxic to sunbirds.</p>	
Cumulative impact post mitigation:	Low	Medium High
Significance rating of impact after mitigation	Low (34)	Medium High (76)



(Low, Medium, Medium-High, High, or Very-High)		
Identified Environmental Impacts	Impeding of the natural surface water catchment and drainage area	
Proposed project layout alternative	1	2
Magnitude of Impact	High (8)	High (8)
Duration of impact:	Permanent (5)	Permanent (5)
Extent of the impact	Site specific (1)	Site specific (1)
Degree to which local resources are irreplaceable	High (4)	High (4)
Degree to which the impact can be reversed:	Low (4)	Low (4)
Probability of occurrence:	High probability (4)	High probability (4)
Cumulative impact prior to mitigation:	Medium High	Medium High
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium High (88)	Medium High (88)
Proposed mitigation:	The buffer zone will be extended to between 70 m – 80 m on the north-western boundary of the population. This will result in the majority of the current exiting surface runoff	Layout Alternative 1 (preferred) is recommended

	and drainage area being included in the buffer zone and kept intact. The rehabilitation and restoration of the micro-habitat will also aid in improved, more controlled and less volatile surface water runoff occurring which could potentially damage the population.	
Cumulative impact post mitigation:	Positive	Medium High
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Positive (+24)	Medium High (88)
Identified Environmental Impacts		
	Destruction/damage to the micro-habitat of the <i>Aloe simii</i> population	
Proposed project layout alternative	1	2
Magnitude of Impact	Very High (10)	Very High (10)
Duration of impact:	Permanent (5)	Permanent (5)
Extent of the impact	Site specific (1)	Site specific (1)
Degree to which local resources are irreplaceable	Definite (5)	Definite (5)



Degree to which the impact can be reversed:	Impact cannot be reversed (5)	Impact cannot be reversed (5)
Probability of occurrence:	Definite (5)	Definite (5)
Cumulative impact prior to mitigation:	Very High	Very High
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Very High (130)	Very High (130)
Proposed mitigation:	Adequately manage and maintain the buffer zone in accordance with the <i>Aloe simii</i> Ecological Impact Assessment recommendations.	Layout Alternative 1 (preferred) is recommended
Cumulative impact post mitigation:	Positive	Very High
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Positive (+24)	Very High (130)
Identified Environmental Impacts	Alien invasive species establishment	
Proposed project layout alternative	1	2
Magnitude of Impact	Low (4)	Low (4)
Duration of impact:	Medium term (3)	Medium term (3)



Extent of the impact	Local (2)	Local (2)
Degree to which local resources are irreplaceable	Low (2)	Low (2)
Degree to which the impact can be reversed:	High (2)	High (2)
Probability of occurrence:	Medium probability (3)	Medium probability (3)
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (39)	Low (39)
Proposed mitigation:	<p>Adequately manage and maintain the buffer zone in accordance with the <i>Aloe simii</i> Ecological Impact Assessment recommendations.</p> <p>Implement suitable alien invasive species establishment prevention measures during the construction phase.</p>	<p>Adequately manage and maintain the buffer zone in accordance with the <i>Aloe simii</i> Ecological Impact Assessment recommendations.</p> <p>Implement suitable alien invasive species establishment prevention measures during the construction phase.</p>
Cumulative impact post mitigation:	Low	Low

Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (26)	Low (26)
Identified Environmental Impacts	Surface material erosion	
Proposed project layout alternative	1	2
Magnitude of Impact	Medium (6)	Medium (6)
Duration of impact:	Short term (2)	Short term (2)
Extent of the impact	Site specific (1)	Site specific (1)
Degree to which local resources are irreplaceable	Moderate (3)	Moderate (3)
Degree to which the impact can be reversed:	High (2)	High (2)
Probability of occurrence:	Medium probability (3)	Medium probability (3)
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium (42)	Medium (42)
Proposed mitigation:	Adequately manage and maintain the buffer zone in accordance with the <i>Aloe simii</i> Ecological Impact Assessment	Adequately manage and maintain the buffer zone in accordance with the <i>Aloe simii</i> Ecological

	<p>recommendations.</p> <p>Implement suitable erosion prevention measures during the construction phase.</p> <p>Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the operational phase. This must be done to ensure that no significant contamination of the drainage line occurs.</p> <p>Adequate management of stormwater runoff quality, quantities and flow speed will be required.</p>	<p>Impact Assessment recommendations.</p> <p>Implement suitable erosion prevention measures during the construction phase.</p> <p>Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the operational phase. This must be done to ensure that no significant contamination of the drainage line occurs.</p> <p>Adequate management of stormwater runoff quality, quantities and flow speed will be required.</p>
<p>Cumulative impact post mitigation:</p>	<p>Low</p>	<p>Low</p>
<p>Significance rating of impact after mitigation</p>	<p>Low (14)</p>	<p>Low (14)</p>



(Low, Medium, Medium-High, High, or Very-High)		
Identified Environmental Impacts	Contamination of the White River and reduction of surface water quality	
Proposed project layout alternative	1	2
Magnitude of Impact	Medium (6)	Medium (6)
Duration of impact:	Long term (4)	Long term (4)
Extent of the impact	Regional (3)	Regional (3)
Degree to which local resources are irreplaceable	Moderate (3)	Moderate (3)
Degree to which the impact can be reversed:	Moderate (3)	Moderate (3)
Probability of occurrence:	High probability (4)	High probability (4)
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium-High (76)	Medium-High (76)
Proposed mitigation:	Adequately manage and maintain the 1:100 year floodline buffer zone in accordance with the <i>Aloe simii</i> Ecological Impact Assessment recommendations.	Adequately manage and maintain the 1:100 year floodline buffer zone in accordance with the <i>Aloe simii</i> Ecological Impact

	<p>Implement suitable erosion prevention measures during the operational phase.</p> <p>Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the operational phases. This must be done to ensure that no significant contamination of the drainage line occurs.</p> <p style="padding-left: 40px;">Adequate management of stormwater runoff quality, quantities and flow speed will be required.</p> <p>Water sample analyses of the drainage line must be continually conducted on a 6 month basis and compared with the baseline data.</p> <p style="padding-left: 40px;">If any contamination or reduction in water quality is determined, the competent authority must immediately be notified and the necessary steps</p>	<p>Assessment recommendations.</p> <p>Implement suitable erosion prevention measures during the operational phase.</p> <p>Adequate storm water management measures must be implemented on site in order to sufficiently manage storm water runoff and clean/dirty separation during the operational phases. This must be done to ensure that no significant contamination of the drainage line occurs.</p> <p>Adequate management of stormwater runoff quality, quantities and flow speed will be required.</p> <p>Water sample analyses of the drainage line must be continually</p>
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	<p>must be followed by the project owner to locate and remediate the source of contamination as soon as practicably possible.</p>	<p>conducted on a 6 month basis and compared with the baseline data.</p> <p>If any contamination or reduction in water quality is determined, the competent authority must immediately be notified and the necessary steps must be followed by the project owner to locate and remediate the source of contamination as soon as practicably possible.</p>
Cumulative impact post mitigation:	Low	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (38)	Low (38)
Identified Environmental Impacts		
Damage or destruction of the graveyard identified on site		
Proposed project layout alternative	1	2
Magnitude of Impact	Medium (6)	Medium (6)



Duration of impact:	Long term (4)	Long term (4)
Extent of the impact	Site specific (1)	Site specific (1)
Degree to which local resources are irreplaceable	High (4)	High (4)
Degree to which the impact can be reversed:	Moderate (3)	Moderate (3)
Probability of occurrence:	Low probability (2)	Low probability (2)
Cumulative impact prior to mitigation:	Low	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (36)	Low (36)
Proposed mitigation:	Adequately manage and maintain the buffer zone implemented around the graveyard.	Adequately manage and maintain the buffer zone implemented around the graveyard.
Cumulative impact post mitigation:	Low	Low
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low (18)	Low (18)
Identified Environmental Impacts	Continued job creation and capacity building (skills, experience and resources development)	

Proposed project layout alternative	1	2
Magnitude of Impact	High (8)	High (8)
Duration of impact:	Medium term (3)	Medium term (3)
Extent of the impact	Regional (3)	Regional (3)
Degree to which local resources are irreplaceable	None (0)	None (0)
Degree to which the impact can be reversed:	0	0
Probability of occurrence:	High probability (4)	High probability (4)
Cumulative impact prior to mitigation:	Positive	Positive
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Positive (+ 56)	Positive (+ 56)
Proposed mitigation:	Ensure that the principle of local employment is applied as far as possible during the project.	Ensure that the principle of local employment is applied as far as possible during the project.
Cumulative impact post mitigation:	Positive	Positive
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Positive (+ 56)	Positive (+ 56)

9.4 PREFERRED ALTERNATIVE CONCLUDING STATEMENT

In identifying, evaluating and comparing impact ratings associated with the proposed development and considered design layout alternatives, it has been concluded that the preferred Alternative 1 layout can be utilised for the proposed project. The design of the layout does not pose significant environmental risk specifically towards the critically endangered *Aloe simii* population and the buffering and rehabilitation mitigations for the area will in fact have a positive impact on the persistence of the population.

10. ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

The processes of investigation which have led to the production of this report, harbours several **assumptions**, which include the following:

- All information provided by the applicant and his/her assistants to the environmental team was correct and valid at the time that it was provided;
- Strategic level investigations undertaken by the agricultural specialist upon instruction from the applicant prior to the commencement of the BA process, determined that the development site represents a potentially suitable and technically acceptable location;
- The public will receive a fair and sufficient opportunity to participate in the BA, through the provision of adequate public participation timeframes stipulated in the Regulations;
- The need and desirability was based on strategic national, provincial and local plans and policies which reflect the interests of both statutory and public viewpoints;
- The information provided by specialists is accurate and unbiased;
- The BA process is a project-level framework and is limited to assessing the anticipated environmental impacts associated with the construction and operational phases of the proposed facility
- Strategic level decision making is conducted through cooperative governance principles with the consideration of sustainable and responsible development principles underpinning all decision making.

Given that a BA involves prediction, **uncertainty** forms an integral part of the process. Two types of uncertainty are associated with the BA process, namely process-related and prediction-related.

- Uncertainty of prediction is critical at the data collection phase as final certainty will only be obtained upon implementation of the proposed development. Adequate research, experience and expertise may minimise this uncertainty;
- Uncertainty of values depicts the approach assumed during the BA process, while final certainty will be determined at the time of decision making. Enhanced communication and widespread/comprehensive coordination can lower uncertainty;
- Uncertainty of related decision relates to the interpretation and decision making aspect of the BA process, which shall be appeased once monitoring of the project phases is undertaken.

The significance/importance of widespread/comprehensive consultation towards minimising the risk/possibility of omitting significant impacts is further stressed. The use of quantitative impact significance rating formulas (as utilised in this document) can further standardise the interpretation of results and limit the occurrence and scale of uncertainty.

Gaps in knowledge can be attributed to:

The BA process is being undertaken prior to the availing of certain technical information which would be derived from the final project design and layout. As such, technical aspects included herein are mainly derived through personal communication with the applicant and the project manager. The technical information will however pose no additional or higher threats of impact.

The principle of human nature also provides for uncertainties with regards to the identified socio-economic impacts of the proposed development.

Enviroworks is an independent environmental consulting firm and as such, all processes and attributes of the BA are addressed in a fair and objective manner. It is believed that through the running of a transparent and participatory process, risks associated with assumptions, uncertainties and gaps in knowledge can be and have been acceptably reduced.

11. PROFESSIONAL OPINION OF THE EAP AND ENVIRONMENTAL IMPACT STATEMENT

11.1 PROFESSIONAL OPINION OF THE EAP

After careful consideration of the findings and outcomes during the BA phase, Enviroworks is of the opinion that the development of the proposed retirement estate can be undertaken without unacceptable or unmanageably significant negative impacts or fatal flaws on the environment, should the prescribed mitigation measures be adequately implemented. Based on all information that was captured in this report, the proposed development will not lead to unacceptable impacts or fatal flaws and should be considered plausible in the framework of NEMA. The majority of the anticipated impacts have low to medium ratings while the impacts determined to have medium-high to high ratings (impacts on the *Aloe simiii* population and White River) can be suitably reduced to within acceptable levels by the implementation of the mitigation and management measures identified and recommended by the specialists.

An Environmental Control Officer (ECO) must be appointed by the applicant/developer to actively assist and undertake environmental compliance audits to ensure that the construction phase of the development is acceptably implemented in an environmentally responsible and sustainable manner in accordance with the recommendations of the EMPr. The ECO must also ensure compliance with the conditions of approval in the EA to be issued by the competent authority.

The results of the appointed ECO's audits should be used to inform an Environmental Close-out Audit Report, which should be submitted to the competent authority at the end of the construction phase.

11.2 ENVIRONMENTAL IMPACT STATEMENT

The key findings of the Scoping phase can be summarised as follows:

The Receiving Environment

Due to the already disturbed and degraded condition of the *Aloe simii* population micro-habitat associated with the proposed project area, the development along with the proposed environmental management recommendations will in fact improve the environmental state of the area and subsequently assist with the persistence of the *Aloe simii* population on site.

Public Participation

To support public interest and BA process, a comprehensive public consultation process will occur throughout the duration of the assessment processes. A diverse mix of authorities, stakeholders and I & AP's will be consulted during this time, representing the environment, social, economic and political sectors of local, regional and provincial bodies.

12. CONCLUSION

This BA process has adequately assessed the potential impacts associated with the proposed development and has determined, based on the outcomes of a multitude of contributing information, that the proposed development would not result in any unacceptable environmental impacts or fatal flaws and as such may be authorised.

The project phase within which this report falls is the Draft Basic Assessment Report, which was coupled with it a 30 day PPP comment period. All stakeholders and registered I & AP's will be informed of the commencement of the PPP via email. Site notices will be put up at various public locations within the area and hardcopies of the report will be made available at various public locations within the area.

13. REFERENCES

Conservation of Agricultural Resources Act (Act 43 of 1983)

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Mucina, L. & Rutherford, M.C. (eds.) 2006. *The Vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

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