



**WRE VENTERSBURG CONSOLIDATED PROSPECTING RIGHT
PROJECT**

**FINAL REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN, INCORPORATING AN
ANNUAL REHABILITATION PLAN AND ENVIRONMENTAL RISK ASSESSMENT**

Submitted in support of the Prospecting Right and Environmental Authorisation Application

Prepared on Behalf of:

**WESTERN ALLEN RIDGE GOLD MINES (PTY) LTD
(Subsidiary of White Rivers Exploration (Pty) Ltd)**

DMR REFERENCE NUMBER: FS 30/5/1/1/3/2/1/1/10489 EM

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Compiled by: Ms Mmakoena Adelaide Mmola
Geologist, Shango Solutions
Cell: (076) 714 7937
E-mail: mmakoena@shango.co.za

Ms Nangamso Zizo Siwendu
Environmental Scientist, Shango Solutions
Cell: (076) 859 2686
E-mail: zizo@shango.co.za

Reviewed by: Dr Jochen Schweitzer
Principal Geologist, Shango Solutions
Cell: (082) 448 2303
E-mail: jochen@shango.co.za

Ms Stefanie Weise
Principal Geologist, Shango Solutions
Cell: (081) 549 5009
E-mail: stefanie@shango.co.za

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Definitions

Abbreviation	Definition
EA	Environmental Authorisation. This constitutes the approval or dismissal of a project as issued by the relevant Competent Authority.
Applicant	The person or party applying for Environmental Authorisation for a listed activity and who is responsible for ensuring the development complies with all relevant legislation whether or not they are the land owner.
BAR and EMPR	Basic Assessment Report and Environmental Management Programme. DMR document for joint BAR and EMP related for mineral applications.
CA	Competent Authority.
DEA	The National Department of Environmental Affairs.
DMR	The Department of Mineral Resources. CA in South Africa for mineral right applications.
DWS	The Department of Water and Sanitation – both national offices and their various regional offices, which are divided across the country on the basis of water catchment areas.
EAR	Environmental Audit Report.
EAP	Environmental Assessment Practitioner.
ECO	Environmental Control Officer.
EIA Regulations	Environmental Impact Assessment Regulations.
EIR and EMP	Environmental Impact Report and Environmental Management Programme. DMR document for joint EIR and EMP related to mineral applications.
Environment	The Environment is defined in terms of the National Environmental Management Act (Act 107 of 1998) as the surroundings within which humans exist and that are made up of: The land, water and atmosphere of the earth: Micro-organisms, plant and animal life, any part or combination of the first three items and the inter-relationships between them the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.
FP	Financial Provision.
FP Regulations	Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations No. 1147 (effective 20 November 2015).
FRDCP	Final Rehabilitation, Decommissioning and Closure Plan.
Fauna	All living biological creatures, usually capable of motion, including insects and predominantly of protein-based consistency.
Fence	A physical barrier in the form of posts and barbed wire or any other concrete construction, (“palisade”-type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.
Flora	All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and usually capable of photosynthesis.
GN	Government Notice.
HSE	Health, Safety and Environment.
I&AP	Interested and Affected Parties.
MPDRA	Minerals and Petroleum Development Act, No 28 of 2002.
PPP	Public Participation Process in terms of the NEMA and MPRDA.
MPDRA	Minerals and Petroleum Development Act, No 28 of 2002.
MP	Mining Permit in terms of the MPRDA.
MR	Mining Right in terms of the MPRDA.
PR	Prospecting Right in terms of the MPRDA.
SAHRA	South African Heritage and Resources Act, No25 of 1999.
SAMRAD	The web-based portal for mineral right applications and management – managed by the DMR.

1 INTRODUCTION

Western Allen Ridge Gold Mines (Pty) Ltd (Subsidiary of White Rivers Exploration (Pty) Ltd) (the Applicant) has submitted an application for a Prospecting Right in terms of Section 16 of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002 – MPRDA) and an application for Environmental Authorisation in terms of Chapter 6 of the GNR 326 (of 2017) promulgated under the National Environmental Management Act (Act No. 107 of 1998 - NEMA) for prospecting of the following minerals:

- Silver
- Gold
- Coal
- Cobalt
- Copper
- Diamond (Alluvial)
- Iron
- Manganese
- Molybdenum
- Nickel
- Lead
- Platinum Group Metals
- Rare Earths
- Sulphur
- Uranium
- Tungsten
- Zinc

The proposed project will aim to ascertain if economically viable mineral deposits exist within the application area. In order to undertake prospecting activities, Western Allen Ridge Gold Mines (Pty) will require a Prospecting Right in terms of the Mineral and Petroleum Resources Development Act (MPRDA, Act No. 28 of 2002). The Applicant is also required to obtain an Environmental Authorisation (EA) in terms of the National Environmental Management Act (NEMA, Act No. 107 of 1998) which involves the submission of a Basic Assessment Report (BAR). Shango Solutions have been appointed by Western Allen Ridge Gold Mines (Pty) to compile the BAR (this report) in support of the Prospecting Right application.

In accordance with Section 24P of the NEMA the Applicant must, before the Minister responsible for mineral resources issues the EA, comply with the prescribed financial provision for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts. This Final Rehabilitation, Decommissioning and Closure Plan (FRDCP) aims to meet this requirement and has been prepared in accordance with the requirements of the NEMA Financial Provisioning Regulations (2015) (NEMA GNR 1147).

According to the regulations, financial provision must be made for rehabilitation and remediation; decommissioning and closure activities at the end of prospecting, exploration, mining or production operations; and remediation and management of latent or residual environmental impacts which may become known in the future. In order to address these requirements, this document includes an annual rehabilitation plan, a final rehabilitation, decommissioning and mine closure plan, and an environmental risk assessment report.

2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

The contact details of the professionals who contributed to the preparation of the annual rehabilitation plan (ARP), final rehabilitation, decommissioning and mine closure plan (FRDCP) and the environmental risk assessment (ERA) are provided in Table 1.

Table 1: Details of EAP.

Name	Role	Qualifications/ Experience
Nangamso Zizo Siwendu	Environmental Scientist/EAP	B.Sc. Hons Environmental Management ~7 years environmental consulting experience
Mmakoena Mmola	EAP	B.Sc. Hons Geochemistry

2.1 EXPERTISE OF THE EAP

2.1.1 Qualifications of the EAP

In terms of Regulation 13 of the 2014 EIA Regulations (Government Notice R. 326 of 2017), an independent EAP, must be appointed by the Applicant to manage the application. Shango Solutions has been appointed by the Applicant as the EAP and is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations and Section 1 of the NEMA. This includes, inter alia, the requirement that Shango Solutions is:

- 1) Objective and independent
- 2) Has expertise in conducting EIA's
- 3) Comply with the NEMA, the Regulations and all other applicable legislation
- 4) Takes into account all relevant factors relating to the application
- 5) Provides full disclosure to the Applicant and the relevant environmental authority

2.1.2 Summary of EAP's Past Experience

Shango Solutions, registered as Dunrose Trading 186 (Pty) Ltd and established in April 2004, provides a diverse range of services to the mineral and mining sectors. Currently, 27 permanent multi-disciplinary employees and about 24 nationally and internationally recognised affiliates are employed. The company has a track record of successful project management and leadership, including complex multi-disciplinary assignments.

Consultancy activities straddle the entire mining value chain from exploration to beneficiation, thereby providing the client with complete solutions. Activities are performed in multi-disciplinary teams. Areas of specialisation include target generation, exploration, geodatabase compilation and management, geological modelling, resource estimation, mineral asset valuations, due diligences, desktop project reviews and technical reporting. The company services the majority of the major mining houses, but also junior exploration companies, mineral resource investment firms, government institutions and departments and the artisanal and small-scale mining sectors. Shango Solutions collaborates closely with local and international experts in the mining and corporate industries. This, in conjunction with our affiliations with academic and parastatal institutions, ensures provision of the most innovative and appropriate solutions to clients.

Shango has completed in excess of 400 projects, of which the majority were located in Africa. The company consequently has extensive ground-based mining related experience throughout Africa, especially southern, eastern and north-west African states. Our extensive knowledge of the African minerals industry has attracted

some of the largest names in mineral extraction to our client base. The project portfolio highlights our cross-sectorial approach and capability.

Shango incorporates in excess of 500 years of Africa-based mining and exploration experience. This includes, but is not limited to, gold, platinum, rare earth elements, base metals, uranium, coal, natural gas, ferrochrome, aggregate, heavy mineral sands and diamonds. Over the last decades, we have established comprehensive 2D Geographic Information Systems (GIS) databases throughout Africa, which consider geological and geophysical data, mineral occurrences, defunct and existing mines, infrastructure and mining statistics.

Ms Siwendu holds a B.Sc. Honours Degree in Environmental Management. She has extensive auditing and environmental management experience, specifically in the mining environment. She has compiled several environmental studies in support of mineral right applications such as for Sungu Sungu Gas (Pty) Ltd, Motuoane Energy (Pty) Ltd, African Exploration, Mining and Finance Corporation, Atoll Metal Recovery, Mafuri Mining and Construction (Pty) Ltd and Tetra 4 (previously known as Molopo South African Exploration).

Ms Mmola holds a B.Sc. Honours Degree in Geochemistry. She has compiled Environmental Auditing and Financial Provision Reports, Environmental Authorisation Applications, Prospecting Work Programmes and Comments and Responses Reports in support of White Rivers Exploration's various Prospecting Right applications.

The declaration of independence of the EAPs and the Curricula Vitae (indicating the experience with environmental impact assessment and relevant application processes) of the consultants involved in the Basic Assessment Report (BAR) process and the compilation of this report are attached as Appendix B in the BAR.

3 LEGISLATIVE FRAMEWORK

The requirement for final rehabilitation, decommissioning and closure stems primarily from the legislative requirements of the MPRDA and NEMA. The relevant extracts from each of these are presented in this section.

3.1 MINERALS AND PETROLEUM RESOURCES DEVELOPMENT ACT, ACT 28 OF 2002

The following extracts relate to the principle of closure for any right issued under the MPRDA:

- Section 43(1): The holder of a prospecting right, mining right, retention permit, mining permit, or previous holder of an old order right or previous owner of works that has ceased to exist, remains responsible for any environmental liability, pollution, ecological degradation, the pumping and treatment of extraneous water, compliance to the conditions of the environmental authorisation and the management and sustainable closure thereof, until the Minister has issued a closure certificate in terms of this Act to the holder or owner concerned
- Section 43(4): An application for a closure certificate must be made to the Regional Manager in whose region the land in question is situated within 180 days of the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment or completion contemplated in subsection (3) and must be accompanied by the required information, programmes, plans and reports prescribed in terms of this Act and the NEMA
- Section 43 (5): No closure certificate may be issued unless the Chief Inspector and each government department charged with the administration of any law which relates to any matter affecting the environment have confirmed in writing that the provisions pertaining to health and safety and

Financial Rehabilitation, Decommissioning and Closure Plan, Incorporating an Annual Rehabilitation Plan and Environmental Risk Assessment FS 30/5/1/1/3/2/1/1/10489 EM management of pollution to water resources, the pumping and treatment of extraneous water and compliance to the conditions of the environmental authorisation have been addressed

- Section 43 (7): The holder of a prospecting right, mining right, retention permit, mining permit, or previous holder of an old order right or previous owner of works that has ceased to exist, or the person contemplated in subsection (2), as the case may be, must plan for, manage and implement such procedures and such requirements on mine closure as may be prescribed
- Section 43 (8): Procedures and requirements on prospecting or mine closure as it relates to the compliance of the conditions of an environmental authorisation, are prescribed in terms of the NEMA

3.2 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT REGULATIONS

The following extracts from the MPRDA Regulations are specifically applicable to the preparation of this FRDCP:

- Regulation 51 (a)(i): An EMPR contemplated in section 39(1) of the Act must include the following: A description of the environmental objectives and specific goals for mine closure
- Regulation 54: Quantum of financial provision:
 - (1) The quantum of the financial provision as determined in a guideline document published by the Department from time to time, include a detailed itemization of all actual costs required for:
 - a. premature closure regarding: (i) the rehabilitation of the surface of the area; (ii) the prevention and management of pollution of the atmosphere; and (iii) the prevention and management of pollution of water and the soil; and (iv) the prevention of leakage of water and minerals between subsurface formations and the surface
 - b. decommissioning and final closure of the operation
 - c. post closure management of residual and latent environmental impacts
 - (2) The holder of a prospecting right, mining right or mining permit must annually update and review the quantum of the financial provision:
 - a. in consultation with a competent person
 - b. as required in terms of the approved EMPR or EMP
 - c. as requested by the Minister
- Regulation 56: Principles for mine closure: In accordance with applicable legislative requirements for mine closure, the holder of a prospecting right, mining right, retention permit or mining permit must ensure that:
 - (a) the closure of a prospecting or mining operation incorporates a process which must start at the commencement of the operation and continue throughout the life of the operation
 - (b) risks pertaining to environmental impacts must be quantified and managed pro-actively, which includes the gathering of relevant information throughout the life of a prospecting or mining operation
 - (c) the safety and health requirements in terms of the Mine Health and Safety Act (Act 29 of 1996) are complied with

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- (d) residual and possible latent environmental impacts are identified and quantified
- (e) the land is rehabilitated, as far as is practicable, to its natural state, or to a predetermined and agreed standard or land use which conforms with the concept of sustainable development
- (f) prospecting or mining operations are closed efficiently and cost effectively
- Regulation 61: Closure objectives- Closure objectives form part of the draft EMPR or EMP, as the case may be, and must:
 - (a) identify the key objectives for mine closure to guide the project design, development and management of environmental impacts
 - (b) provide broad future land use objective(s) for the site
 - (c) provide proposed closure costs
- Regulation 62: Contents of closure plan: A closure plan contemplated in section 43(3)(d) of the Act, forms part of the EMPR or EMP, as the case may be, and must include:
 - (a) a description of the closure objectives and how these relate to the prospecting or mine operation and its environmental and social setting
 - (b) a plan contemplated in regulation 2(2), showing the land or area under closure
 - (c) a summary of the regulatory requirements and conditions for closure negotiated and documented in the EMPR or EMP, as the case may be
 - (d) a summary of the results of the Environmental Risk Report and details of identified residual and latent impacts
 - (e) a summary of the results of progressive rehabilitation undertaken
 - (f) a description of the methods to decommission each prospecting or mining component and the mitigation or management strategy proposed to avoid, minimise and manage residual or latent impacts
 - (g) details of any long-term management and maintenance expected
 - (h) details of a proposed closure cost and financial provision for monitoring, maintenance and post closure management
 - (i) a sketch plan drawn on an appropriate scale describing the final and future land use proposal and arrangements for the site
 - (j) a record of interested and affected persons consulted
 - (k) technical appendices, if any

3.3 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

Prior to the 8th December 2014, the environmental aspects of prospecting activities were regulated in terms of the MPRDA. Recent legislative amendments and the drive towards a 'one environmental system' have resulted in the inclusion of the requirement for rehabilitation, decommissioning and closure planning and associated financial provisions into the NEMA. Specific sections of the act are extracted below:

- Section 24P: Financial provision for remediation of environmental damage:

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- (1) An applicant for an Environmental Authorisation relating to prospecting, exploration, mining or production must, before the Minister responsible for mineral resources issues the Environmental Authorisation, comply with the prescribed financial provision for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts
- (2) If any holder or any holder of an old order right fails to rehabilitate or to manage any impact on the environment, or is unable to undertake such rehabilitation or to manage such impact, the Minister responsible for mineral resources may, upon written notice to such holder, use all or part of the financial provision contemplated in subsection (1) to rehabilitate or manage the environmental impact in question
- (3) Every holder must annually:
 - a. assess his or her environmental liability in a prescribed manner and must increase his or her financial provision to the satisfaction of the Minister responsible for mineral resources
 - b. submit an audit report to the Minister responsible for mineral resources on the adequacy of the financial provision from an independent auditor
- (4) (a) If the Minister responsible for mineral resources is not satisfied with the assessment and financial provision contemplated in this section, the Minister responsible for mineral resources may appoint an independent assessor to conduct the assessment and determine the financial provision. (b) Any cost in respect of such assessment must be borne by the holder in question
- (5) The requirement to maintain and retain the financial provision contemplated in this section remains in force notwithstanding the issuing of a closure certificate by the Minister responsible for mineral resources in terms of the MPRDA to the holder or owner concerned and the Minister responsible for mineral resources may retain such portion of the financial provision as may be required to rehabilitate the closed mining or prospecting operation in respect of latent, residual or any other environmental impacts, including the pumping of polluted or extraneous water, for a prescribed period
- (6) The Insolvency Act (Act No. 24 of 1936), does not apply to any form of financial provision contemplated in subsection (1) and all amounts arising from that provision
- (7) The Minister, or a Member of the Executive Committee (MEC) in concurrence with the Minister, may in writing make subsections (1) to (6) with the changes required by the context applicable to any other application in terms of this Act

3.4 FINANCIAL PROVISIONING REGULATIONS

The prescribed manner in which the environmental liability is to be assessed, is outlined in the Financial Provisioning Regulations, 2015 (GNR1147) was published on the 20th of November 2015. Amendments published under GN 1314 in Government Gazette 40371 on the 26th of October 2016 extend the transitional arrangements by 39 months from the published date for holders of an existing right. The Regulations aim to regulate the determination and making of financial provision as contemplated in the NEMA for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from

Financial Rehabilitation, Decommissioning and Closure Plan, Incorporating an Annual Rehabilitation Plan and Environmental Risk Assessment FS 30/5/1/1/3/2/1/1/10489 EM prospecting, exploration, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. These regulations provide for, inter alia:

- Determination of financial provision: An applicant or holder of a right or permit must determine and make financial provision to guarantee the availability of sufficient funds to undertake rehabilitation and remediation of the adverse environmental impacts of prospecting, exploration, mining or production operations, as contemplated in the Act and to the satisfaction of the Minister responsible for mineral resources
- Scope of the financial provision: Rehabilitation and remediation; decommissioning and closure activities at the end of operations; and remediation and management of latent or residual impacts
- Regulation 6: Method for determining financial provision: An applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for:
 - Annual rehabilitation: annual rehabilitation plan
 - Final rehabilitation, decommission and closure at end of life of operations: rehabilitation, decommissioning and closure plan
 - Remediation of latent and residual impacts: environmental risk assessment report
- Regulation 10: An applicant must:
 - Ensure that a determination is made of the financial provision and the plans contemplated in Regulation 6 are submitted as part of the information submitted for consideration by the Minister responsible for mineral resources of an application for Environmental Authorisation, the associated EMPR and the associated right or permit in terms of the MPRDA
 - Provide proof of payment or arrangements to provide the financial provision prior to commencing with any prospecting, exploration, mining or production operations
- Regulation 11: Requires annual review, assessment and adjustment of the financial provision. The review of the adequacy of the financial provision including the proof of payment must be independently audited (annually) and included in the audit of the EMPR as required by the EIA regulations
- Regulation 17: The holders of rights have until January 2020 to align with the NEMA Closure Regulations

3.5 OTHER GUIDELINES

The following additional guidelines which relate to financial provisioning and closure have been published in the South African context:

- Best Practice Guideline G5: Water Management Aspects for Mine Closure: This guideline was prepared by the Department of Water and Sanitation and aims to provide a logical and clear process that can be applied by mines and the competent authorities to enable proper mine closure planning that meets the requirements of the relevant authorities. This guideline is aimed primarily at larger scale mines and does not specifically address closure issues related to closure of prospecting activities

4 FINAL REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN (FRDCP)

According to the NEMA GNR 1147 the objective of the final rehabilitation, decommissioning and closure plan, is to identify a post-mining land use that is feasible through-

- a) Providing the vision, objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project
- b) Outlining the design principles for closure
- c) Explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation
- d) Detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure
- e) Committing to a schedule, budget, roles and responsibilities for final rehabilitation
- f) decommissioning and closure of each relevant activity or item of infrastructure
- g) Identifying knowledge gaps and how these will be addressed and filled
- h) Detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed
- i) h) Outlining monitoring, auditing and reporting requirements

4.1 PROJECT AND ENVIRONMENTAL CONTEXT

This section aims to provide context and focus attention on the material information and issues that have guided the development of this FRDCP. Further details on the project and environmental context can be obtained from the Basic Assessment Report.

4.1.1 PROJECT CONTEXT

Please refer to the detailed description of the project as provided for in Section 2 of the BAR. The planned invasive prospecting activities, which would require inclusion in the FRDCP are extracted and described below.

4.1.1.1 Location

The area of interest occupies a total of approximately 7 943.07 hectares (ha) and is situated 14 kilometres (km) north-northeast of Ventersburg in the Free State Province of South Africa (Figure 1). The prospecting area is located in the Kroonstad, Ventersburg and Hennenman Magisterial Districts and extends over fifty-three (53) farm portions. Table 2 indicates the property details within the Prospecting Right application area.

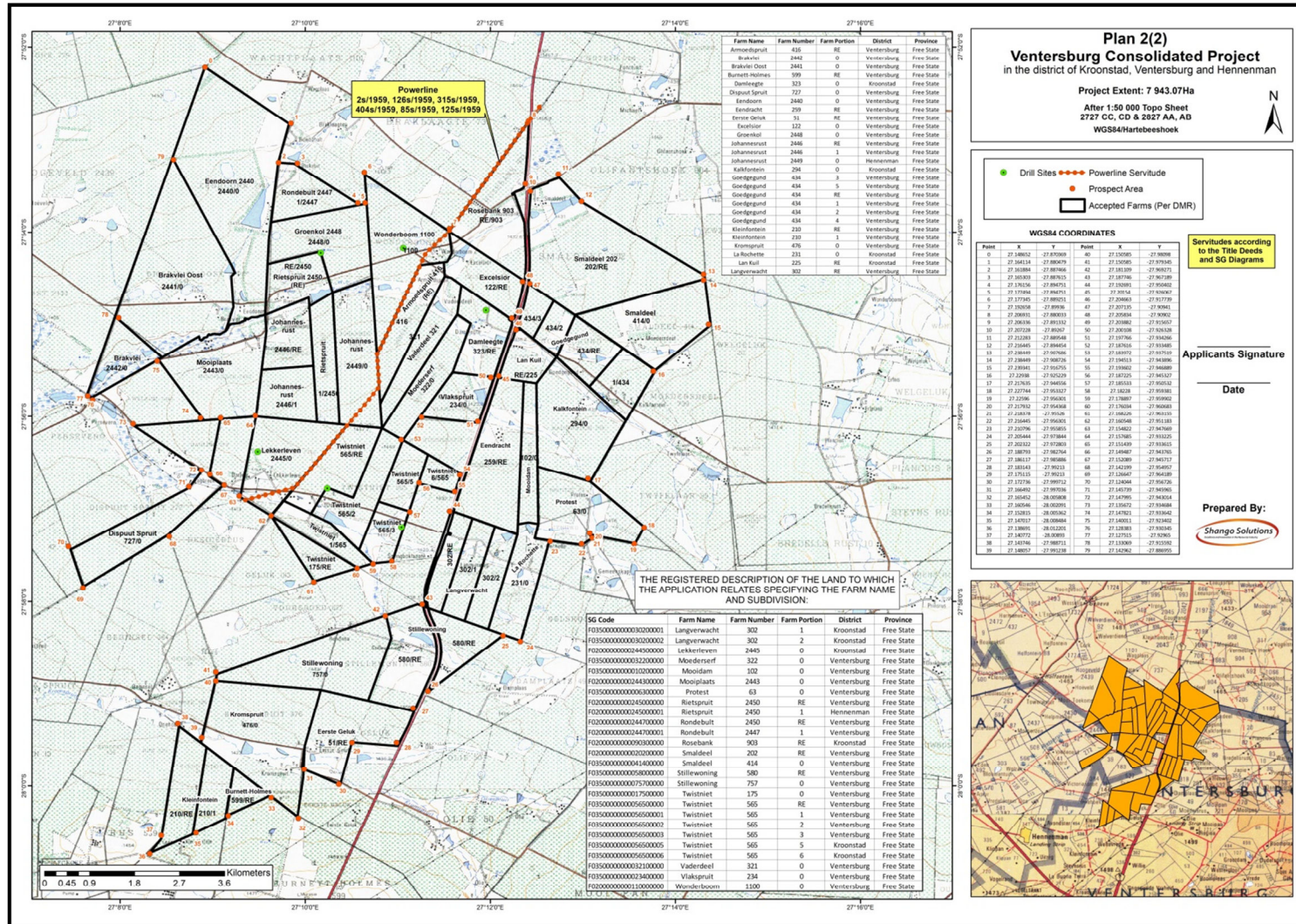


Figure 1: Locality map indicating the farm portions.

Table 2: Locality details.

Farm Name	
	1- Amoedspruit 416 Portion RE
	2- Brakvlei 2442 Portion 0
	3- Brakvlei Oost 2441 Portion 0
	4- Burnett-Holmes 599 Portion RE
	5- Damleegte 323 Portion 0
	6- Dispuut Spruit 272 Portion 0
	7- Eendoorn 2440 Portion 0
	8- Eendracht 259 Portion RE
	9- Eerste Geluk 51 Portion RE
	10- Excelsior 122 Portion 0
	11- Groenkol 2448 Portion 0
	12- Johannesrust 2446 Portion RE
	13- Johannesrust 2446 Portion 1
	14- Johannesrust 2449 Portion 0
	15- Kalkfontein 294 Portion 0
	16- Goedgegund 434 Portion 3
	17- Goedgegund 434 Portion 5
	18- Goedgegund 434 Portion RE
	19- Goedgegund 434 Portion 1
	20- Goedgegund 434 Portion 2
	21- Goedgegund 434 Portion 4
	22- Kleinfontein 210 Portion RE
	23- Kleinfontein 210 Portion 1
	24- Kromspruit 476 Portion 0
	25- La Rochette 231 Portion 0
	26- Lan Kuil 225 Portion RE
	27- Langverwacht 302 Portion RE
	28- Langverwacht 302 Portion 1
	29- Langverwacht 302 Portion 2
	30- Lekkerleven 2445 Portion 0
	31- Moederserf 322 Portion 0
	32- Mooidam 102 Portion 0
	33- Mooiplaats 2443 Portion 0
	34- Protest 63 Portion 0
	35- Rietspruit 2450 Portion RE
	36- Rietspruit 2450 Portion 1
	37- Rondebult 2447 Portion RE

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	38- Rondebult 2447 Portion 1 39- Rosebank 903 Portion RE 40- Smaldeel 202 Portion RE 41- Smaldeel 414 Portion 0 42- Stillewoning 580 Portion RE 43- Stillewoning 757 Portion 0 44- Twistniet 175 Portion 0 45- Twistniet 565 Portion RE 46- Twistniet 565 Portion 1 47- Twistniet 565 Portion 2 48- Twistniet 565 Portion 3 49- Twistniet 565 Portion 5 50- Twistniet 565 Portion 6 51- Vaderdeel 321 Portion 0 52- Vlakspruit 234 Portion 0 53- Wonderboom 1100 Portion 0		
Application Area (Ha)	The application area extends over fifty-three (53) farm portions with a total area of 7 943.07 ha.		
Magisterial District	Kroonstad, Ventersburg and Hennenman Magisterial Districts		
Distance and direction from nearest town	The WRE Ventersburg Consolidated Prospecting Right application area is located 14 kilometres (km) north-northeast of Ventersburg in the Free State Province of South Africa. The application area approximately 25 km south of Kroonstad, 10 km north-northwest of Hennenman and is bisected by the N1 highway.		
21 digit Surveyor General Code for each Portion	Farm Name:	Portion:	SG Codes:
	1- Amoedspruit 416	RE	F03500000000041600000
	2- Brakvlei 2442	0	F02000000000244200000
	3- Brakvlei Oost 2441	0	F02000000000244100000
	4- Burnett-Holmes 599	0	F03500000000059900000
	5- Damleegte 323	0	F03500000000032300000
	6- Dispuut Spruit 272	0	F03500000000072700000
	7- Eendoorn 2440	0	F02000000000244000000
	8- Eendracht 259	RE	F03500000000025900000
	9- Eerste Geluk 51	RE	F0350000000005100000

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10- Excelsior 122	0	F03500000000012200000
11- Groenkol 2448	0	F02000000000244800000
12- Johannesrust 2446	RE	F02000000000244600000
13- Johannesrust 2446	1	F02000000000244600001
14- Johannesrust 2449	0	F02000000000244900000
15- Kalkfontein 294	0	F03500000000029400000
16- Goedgegund 434	3	F02000000000043400003
17- Goedgegund 434	5	F02000000000043400005
18- Goedgegund 434	RE	F03500000000043400000
19- Goedgegund 434	1	F03500000000043400001
20- Goedgegund 434	2	F03500000000043400002
21- Goedgegund 434	4	F03500000000043400004
22- Kleifontein 210	RE	F03500000000021000000
23- Kleifontein 210	1	F03500000000021000001
24- Kromspruit 476	0	F03500000000047600000
25- La Rochette 231	0	F03500000000023100000
26- Lan Kuil 225	RE	F03500000000022500000
27- Langverwacht 302	RE	F03500000000030200000
28- Langverwacht 302	1	F03500000000030200001
29- Langverwacht 302	2	F03500000000030200002
30- Lekkerleven 2445	0	F02000000000244500000
31- Moederserf 322	0	F03500000000032200000
32- Moidam 102	0	F03500000000010200000
33- Mooiplaats 2443	0	F02000000000244300000
34- Protest 63	0	F03500000000006300000
35- Rietspruit 2450	RE	F02000000000245000000
36- Rietspruit 2450	1	F02000000000245000001
37- Rondebult 2447	RE	F02000000000244700000

	38- Rondebult 2447	1	F02000000000244700001
	39- Rosebank 903	0	F02000000000090300000
	40- Smaldeel 202	RE	F02000000000020200000
	41- Smaldeel 414	0	F02000000000020200000
	42- Stillewoning 580	RE	F03500000000058000000
	43- Stillewoning 757	0	F03500000000043400004
	44- Twistniet 175	0	F03500000000017500000
	45- Twistniet 565	RE	F03500000000056500000
	46- Twistniet 565	1	F03500000000056500001
	47- Twistniet 565	2	F03500000000056500002
	48- Twistniet 565	3	F03500000000056500003
	49- Twistniet 565	5	F03500000000056500005
	50- Twistniet 565	6	F03500000000056500006
	51- Vaderdeel 321	0	F03500000000032100000
	52- Vlakspruit 234	0	F03500000000023400000
	53- Wonderboom 1100	0	F02000000000110000000

5 DESCRIPTION AND SCOPE OF THE PROPOSED ACTIVITIES

Invasive and non-invasive prospecting activities will be undertaken as part of the proposed Prospecting Work Programme (PWP). Seven (7) non-invasive activities will be undertaken, namely desktop studies and acquisition of historical data, data inventory and capturing, data synthesis and database creation, generation of geological models, location of key historic borehole core (if available), re-logging and re-sampling of historic drillholes and resource estimation. Only one (1) invasive activity will be undertaken, which is the drilling of six (6) diamond core drillholes.

The scope of these activities is as follows:

Phase 1

1.1 Investigate all sources for historical data

[Year 1: 6 months]

Prospecting for gold in the Free State area started in the 1930's resulting in nearly 90 years' worth of exploration in the area. Hence, there exists a significant amount of historical exploration data in the Free State and over the project area. Obtaining and analysing this historical data will allow the fast-tracking of prospecting activities. Heavy mineral sands can also be investigated as a potential resource and as an aid to the development of the geological model.

1.2 Obtain all relevant historical data**[Year 1: 6 months]**

Historical data detailing the position and economic potential of the target horizons will be identified for potential acquisition. The data obtained is anticipated to be in the form of historical borehole information, cadastral maps, geological maps, geophysical surveys (including existing published gravimetric, radiometric, magnetic, seismic and remote sensing data), as well as any information pertaining to previous exploration or mining will be consulted and integrated. The data will be scrutinised and verified (QA/QC procedure).

Data acquisition will begin with commercial negotiations to allow Western Allen Ridge to gain access to the drillholes for use in the desktop study, geological model and potential resource estimate.

1.3 Desktop study**[Year 1: 6 months]**

A desktop study will be performed utilising all the historical reports obtained during Step 1.2.

Phase 2**2.1 Inventorise, capture and QA/QC all available historical data****[Year 2: 5 months]**

The data located and acquired during Year One will be inventorised in Microsoft Access databases for future reference and ease of access to relevant information. The capturing of data will transform hard copy information into an electronic format, creating a powerful tool for use in 3 dimensional (3D) geological modelling and efficient resource estimation.

2.2 Data synthesis and database creation**[Year 2: 5 months]**

The above data will be compiled into a geological database, which will be utilised to present the relevant data in useable Geographic Information System (GIS) digital map format. The different data sets will be plotted on a base map of the project and surrounding areas in order to develop a geological model. This model will be used to further refine the exploration programme for the target area.

2.3 Definition of regional geological characteristics**[Year 2: 2 months]**

With the improved geological and geophysical datasets it will be possible to increase the confidence in the basic sedimentological and structural geological models and identify areas where the initial geological model should be created.

Phase 3**3.1 Generate the initial geological model****[Year 3: 6 months]**

Utilising the historical data, a preliminary 3D geological model will be developed. This model will be employed to further refine the exploration programme for the prospect area.

3.2 Location of key historic borehole core, if available**[Year 3: 6 months]**

Based on the initial geological model, specific key drillholes previously drilled in the area will be identified and negotiations with the owners undertaken to obtain access to the core.

3.3 Re-logging and re-sampling of historical drillholes**[Year 3: 6 months]**

Once access to the historical core is obtained, the core will be re-logged and, if necessary, re-sampled. This activity will allow verification of the historical borehole logs and consequently increase confidence in the data underpinning the geological model.

Phase 4**4.1 Drilling of 2 diamond drillholes to a depth of 500m****[Year 4: 5 months]**

Depending on the initial geological model established, a diamond drilling programme (Figures 2 and 3) comprising of two drillholes will be undertaken.

Drilling will be conducted in a competent and environmentally responsible manner including rehabilitation of the drill sites to their original state. Plastic lining will be placed underneath the rig motors to prevent oil seepage. It is noted that no drilling fluids other than water for dust suppression, will be utilised in the case of diamond drilling. Environmental rehabilitation measures will be included in the contract with the drilling company and environmental rehabilitation costs will be included in the drilling costs.

4.2 Logging and sampling of drillholes [Year 4: 4 months]

Once the holes are drilled, logging and sampling will be performed to capture the drillhole information into the database.

4.3 Refinement of geological model [Year 4: 3 months]

The data obtained from the drilling and logging of the holes will be integrated into the geological model to confirm the geology and refine the future drilling targets. The updated geological model will be utilised to site the drillholes planned during the Year 5 drilling programme.

Phase 5

5.1 Drilling of 4 diamond drill holes to a depth of 500m [Year 5: 7 months]

Additional four diamond drillholes will be drilled. Should the drilling programme prove to be successful, additional holes will be considered. This will be indicated in the form of a S102 application together with the proposed revised prospecting plan and EMPR.

5.2 Logging and sampling of drillholes [Year 5: 4 months]

Once the holes are drilled, logging and sampling will be performed to capture the drillhole information into the database.

5.3 Finalisation of 3D geological model [Year 5: 4 months]

Based on the re-logging and re-sampling of the historical core, the 3D geological model will be updated and finalised for use during resource estimation.

5.4 Resource estimation [Year 5: 2 months]

Utilising the finalised geological model together with historical assay results and any results from re-sampling, a resource estimate will be performed.



Figure 2: A typical drill rig.



Figure 3: Typical diamond drill bits.

Table 3: Planned invasive and non-invasive activities.

Phase	Activity	Skill(s) required	Timeframe	Outcome	Timeframe for outcome	What technical expert will sign off on the outcome?
1	Non-invasive Prospecting	Qualified geologists (B.Sc. (Hons.) a minimum qualification)	6 months	Establishment of historical data inventory	Month 12	Principal Geologist
	Investigate possible sources for historical data			Database of historical data		
	Obtain relevant historical data		6 months	Characterisation of geological features on the project area and surrounds		
2	Non-invasive Prospecting	Qualified geologists (B.Sc. Hons. a minimum qualification)	12 months	Complete, detailed database of historic exploration activities and results	Month 24	Senior Geologist
	Inventorise, capture and QA/QC historical data					
	Data synthesis and database creation			Definition of regional geological characteristics		
3	Non-invasive Prospecting	Qualified geologists (B.Sc. Hons. a minimum qualification)	12 months	Initial geological model	Month 36	Principal Geologist
	Generate the initial geological model			Report detailing the availability of the historical drillhole core		
	Location of key historic drillhole core, if available			Resampled core for QA/QC and confidence for resource estimation		
4	Non-invasive Prospecting	Qualified geologists (B.Sc. Hons. a minimum qualification)	4 months	Drillhole core	Month 48	Senior Geologist
	Drilling of 2 diamond drillholes to a depth of 500 m					
	Invasive Prospecting		4 months	Geological log and assay results		
	Logging and sampling of					

Phase	Activity	Skill(s) required	Timeframe	Outcome	Timeframe for outcome	What technical expert will sign off on the outcome?
	new drillholes					
	Revise geological model		4 months	Refined geological model		
5	Invasive Prospecting	Qualified geologists (B.Sc. Hons. a minimum qualification)	12 months	Drillhole core	Month 60	Senior Geologist
	Drilling of 4 diamond drillholes to a depth of 500 m					
	Non-invasive Prospecting					
	Logging and sampling of new drillholes					
	Finalisation of 3D geological model	Geological log and assay results				
	Final geological model					
	Resource estimation	Qualified resource geologist		Resource estimate		Principal Geologist, Resource Geologist

5.1 DESCRIPTION OF SITE ACTIVITIES

5.1.1 Access Roads

The application area is predominately natural grasslands and is used for commercial dry land agricultural activities (crop production (maize) and livestock (cattle)). There are existing farm roads. These farm roads will be used to access drilling areas and where there are no access roads, new roads will be created. No multiple roads will be created to access a single area. Roads created to gain access to drilling sites will be rehabilitated on completion of the drilling operations to the satisfaction of the relevant landowner.

5.1.2 Water Supply

It is not known if there are any water drillholes located on the site and if access and supply will be granted by landowners. Water sourced from the Local Municipality will be trucked to the drill sites. In order to prevent dust pollution on untarred roads, water bowsers must be utilised when required.

Continuous water supply will be required during drilling. An on-site water storage tanks with a capacity of at least 15 000 litres will be required. Additional water requirements relate to the potable water supply for employees and workers. A temporary 260 litre on-site vertical water storage tank for drinking water is recommended during the drilling operations.

5.1.3 Ablution

Ablution facilities at the drill site will be required and may involve the installation of drum or tank type portable toilets. The toilets should be emptied twice every week through the services of a registered sewage waste service provider. The ablution facilities must be provided at a ratio of 15: 1 (15 people per 1 toilet).

5.1.4 Temporary Office Area

A temporary shaded site office area may be erected on site. The office must be established away from the water drainage lines. A shaded eating area may be provided.

5.1.5 Accommodation

No accommodation for staff and workers will be provided on-site and all persons will be accommodated in nearby towns (i.e. Hennenman, Kroonstad and Ventersburg). Workers will be transported to and from the prospecting site on a daily basis. Night security staff may be employed once equipment is stationed on-site. No fires will be allowed on site.

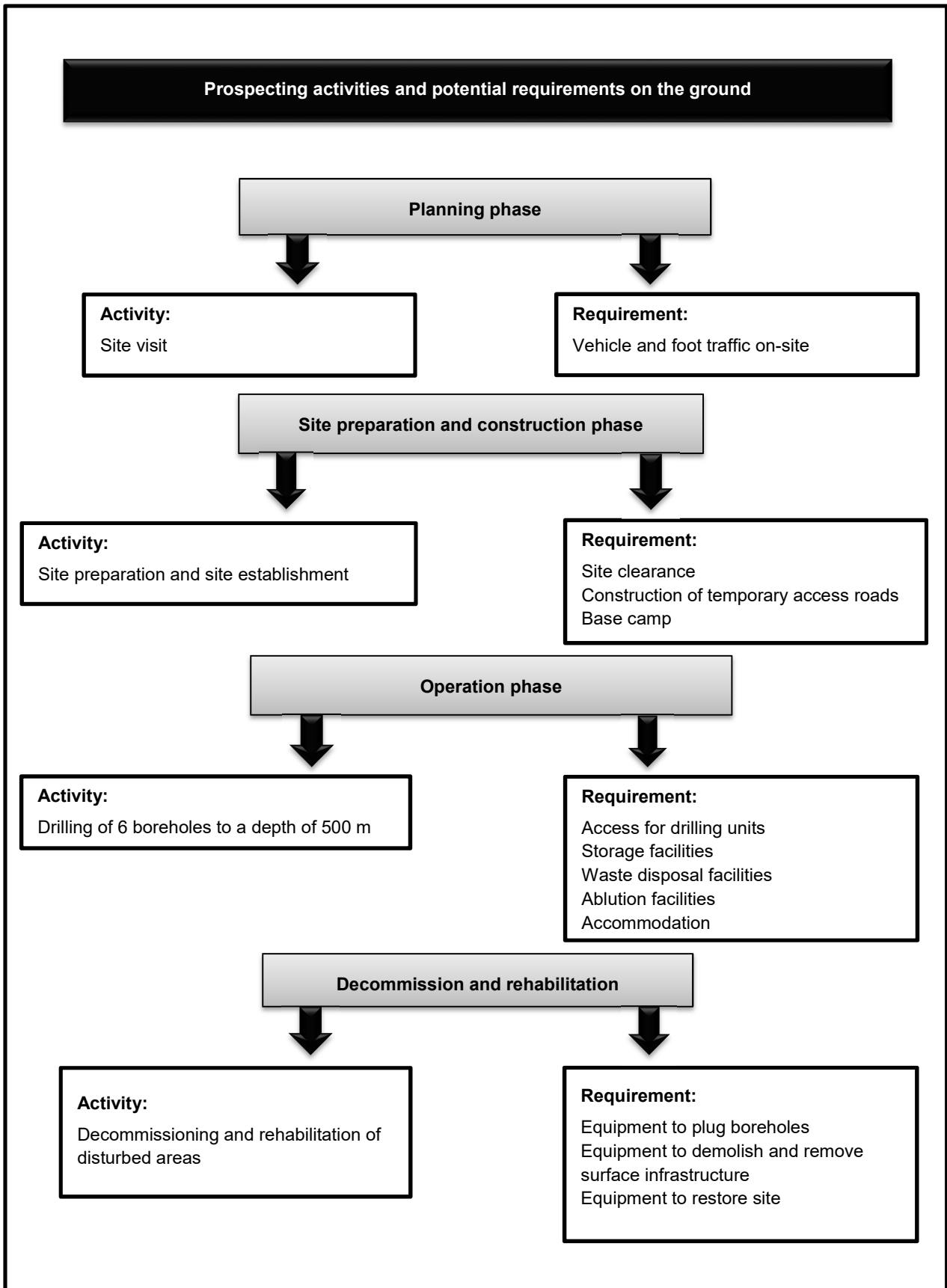
5.1.6 Storage of Dangerous Goods

During drilling activities, limited quantities of diesel fuel, oil and lubricants may be stored on-site. The only dangerous good that may be stored is diesel fuel. A maximum amount of 60 m³ of diesel fuel may be stored in above ground diesel storage tanks with elevated bunded walls.

5.1.7 Equipment and/or Technology That May Be Used

- Drill rig/s
- A water tanker
- 4x4 Bakkie/s
- Geological modelling software

Figure 4: Prospecting activities and potential requirements associated with each phase.



5.2 ENVIRONMENTAL AND SOCIAL CONTEXT

The description and definition of the pre-prospecting environmental context is critical to ensure that the ultimate closure objectives and associated end land-use are achieved. In this regard please refer to Section 8 of the BAR for a detailed description of the receiving environment applicable to this specific project. Based on the description of the receiving environmental and social context, this FRDCP is based on the understanding that the predominant land-uses on the application area are:

- Wetlands
- Cultivated Fields (high and medium)
- Grassland
- Woodland/Open Bush

The description of the baseline environment (on site and surrounding) was obtained from the studies undertaken by the specialist team and in conjunction with Shango Solutions. All specialist studies undertaken for the proposed WRE Ventersburg Consolidated Prospecting Right project are included as supporting technical appendices to the BAR. The key environmental aspects related to the Prospecting Right area are summarised below.

5.2.1 Geology, Soils and Topography

The Free State Goldfield was discovered by geophysical means during the 1930's, when Dr. R Krahnmann delineated the edge of the Witwatersrand Basin by mapping magnetic shales of the West Rand Group with a magnetometer. This was followed by extensive diamond exploration drilling, which intersected the auriferous conglomerates of the Central Rand Group. As a result, one of the major goldfields on Earth was developed.

Mining in the Free State Goldfield concentrated on the extraction of the Basal, Steyn, Saaiplaas and Leader reefs of the Central Rand Group. Several other ore bodies were extracted, also belonging to the Kimberley and Elsburg formations. Formations are generally marked by angular, erosional unconformities, which are onlapping towards the edge of the Witwatersrand Basin. Major structural displacements, several hundreds of metres in magnitude, are encountered in the Free State Goldfield. Faulting, but also folding, predominantly occurred during extrusion of the Ventersdorp Supergroup flood basalts.

The surface geology of the area is dominated by thin Quaternary sediments. The main targets for prospecting are the conglomerates (reefs) of the Central Rand Group within the Witwatersrand Supergroup. These are overlain by 500 m of Karoo Supergroup strata, predominantly horizontally bedded sandstones and shales of the Ecca Group. The Ecca Group contains coal at shallow depths which might be exploitable (Figure 5).

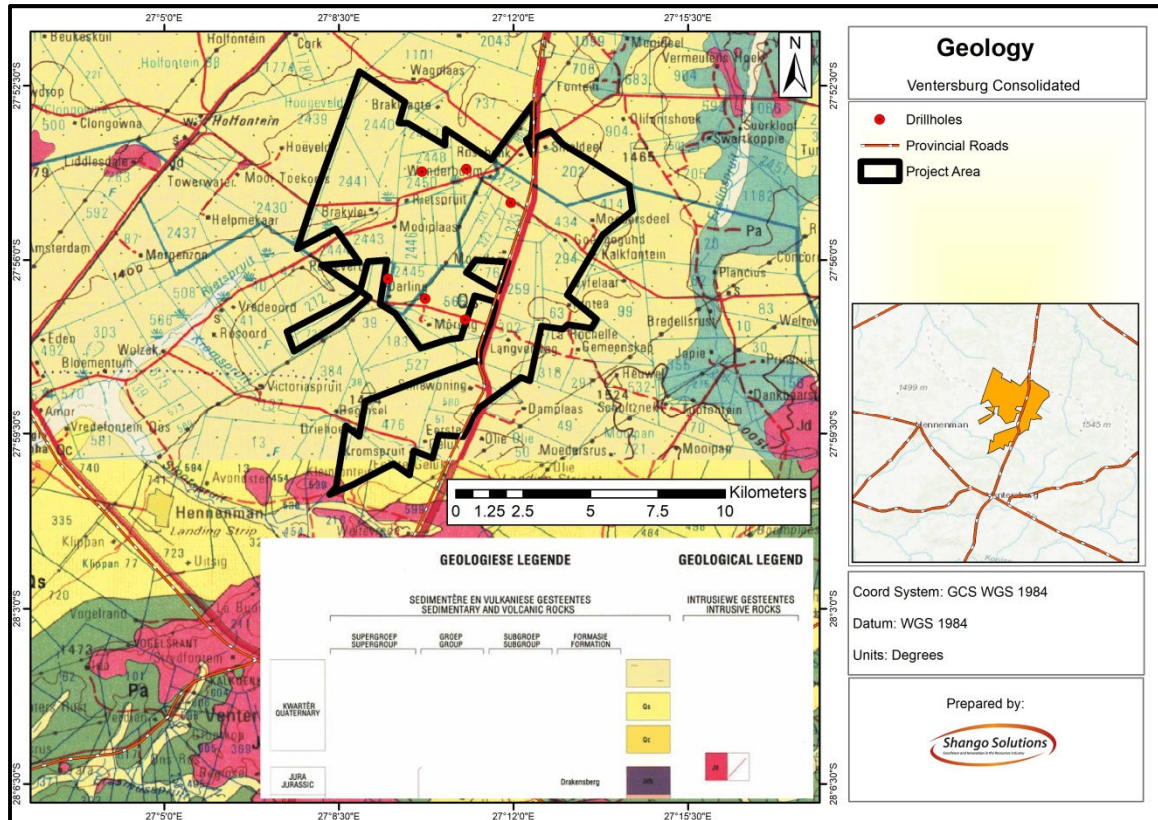


Figure 5: Geology of the application area.

Soil reflects the influence of geology, topography and climate over time and is an important indicator of agricultural potential. The dominant soil type is Bd, closely followed by Bc, Ae, and Ba. These soils are mainly red and yellow apedal soils. They range from moderate to high fertility status with large variability in texture, and are mostly characterised as sandy to sandy clay loams. The Bd, Bc, and Ba types contain a greyish subsoil layer where iron and manganese accumulate in mottles caused by to a seasonally fluctuating water table. These mottles eventually harden to form concretions which cause restricted water infiltration (AGIS, 2015).

The topography of the application area comprises of plains varying in altitude between 1 000 and 1 500 metres above mean sea level (MAMSL).

5.2.2 Climate

The climate of the area is characterised by mild to hot summers with rainfall (November to March) and extremely cold winter temperatures.

5.2.3 Culture and Heritage Assessment

Cultural and heritage features have been identified within the proposed application area (a family burial site and the Barn Guesthouse). According to the Heritage Impact Assessment undertaken over the application area, the areas for the proposed drilling activities are largely utilised for commercial crop production (Figure 6). As such, the proposed six drillhole sites are located on transformed land with very little possibility of the presence of archaeological finds or heritage resources.

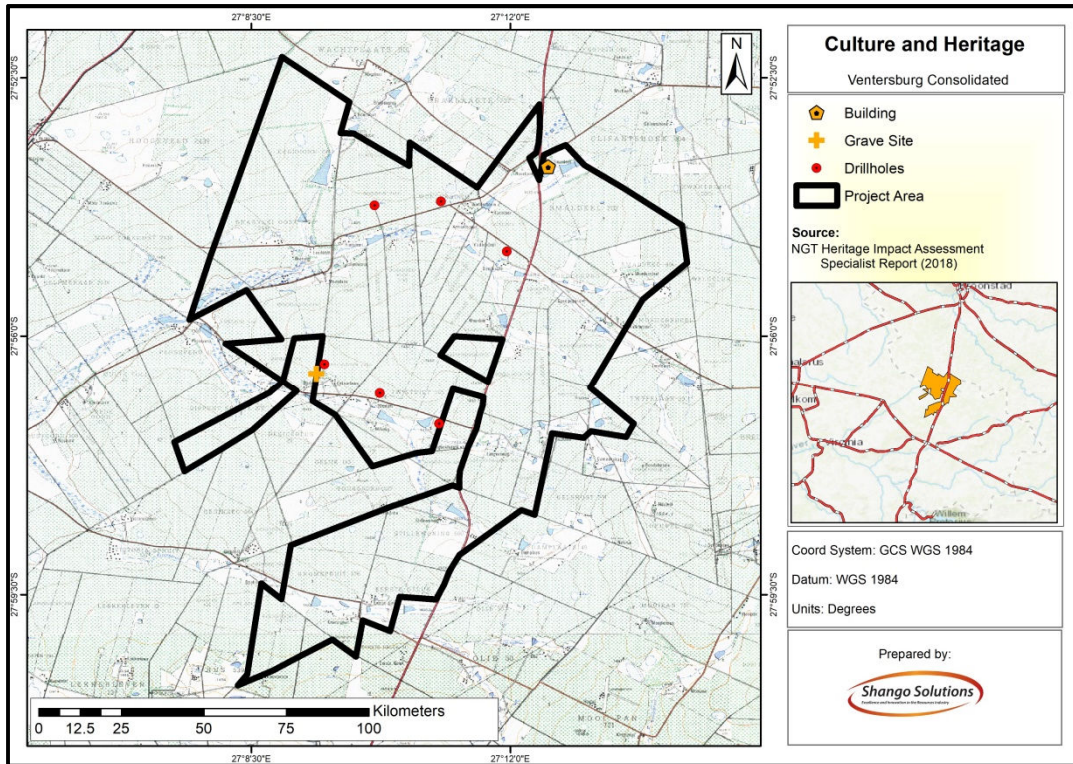


Figure 6: Map showing drillholes.

The two heritage sites identified within the application area during the Heritage Impact Assessment are of high sensitivity (Figure 7). However, these two sites will not be impacted by the proposed prospecting activities as they are located outside the areas where the proposed drilling activities will take place

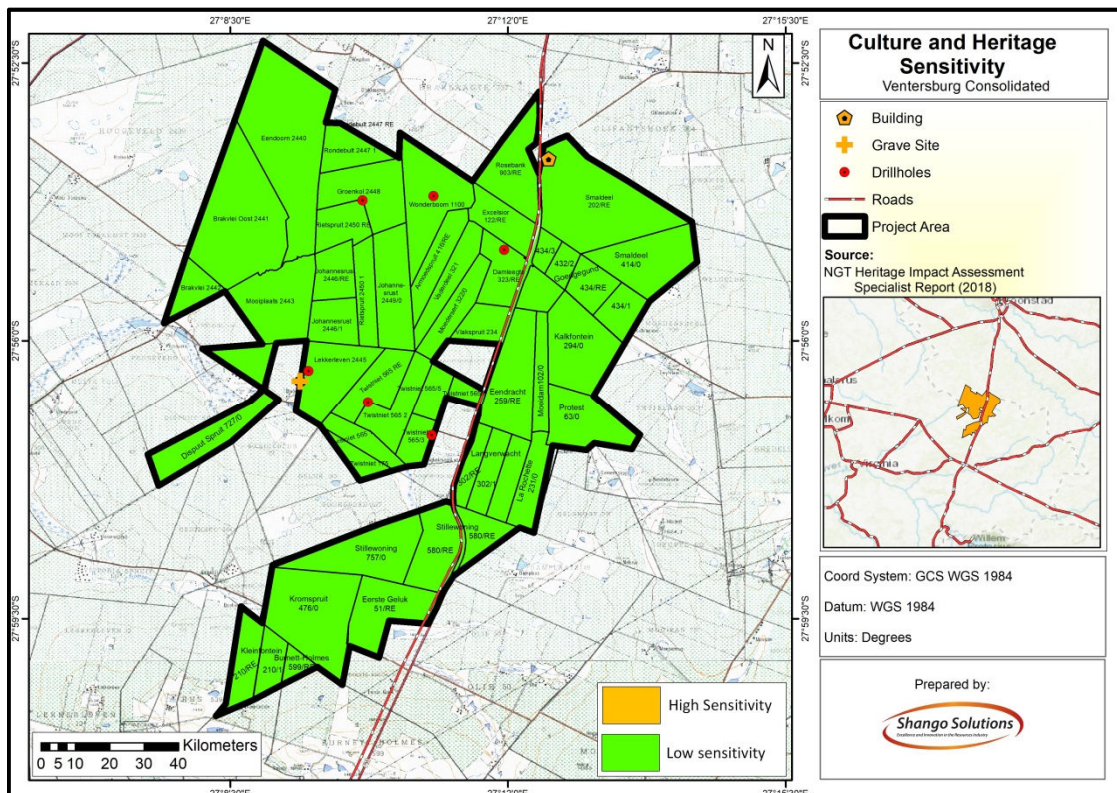


Figure 7: Culture and heritage sensitivity map.

5.2.4 Surface Hydrology

The application area falls in the Vaal Water Management Area (Figure 8), which includes major rivers such as the Vaal, Wilge, Liebenbergsvlei, Mooi, Renoster, Vals, Sand, Vet, Harts and Molopo Rivers.

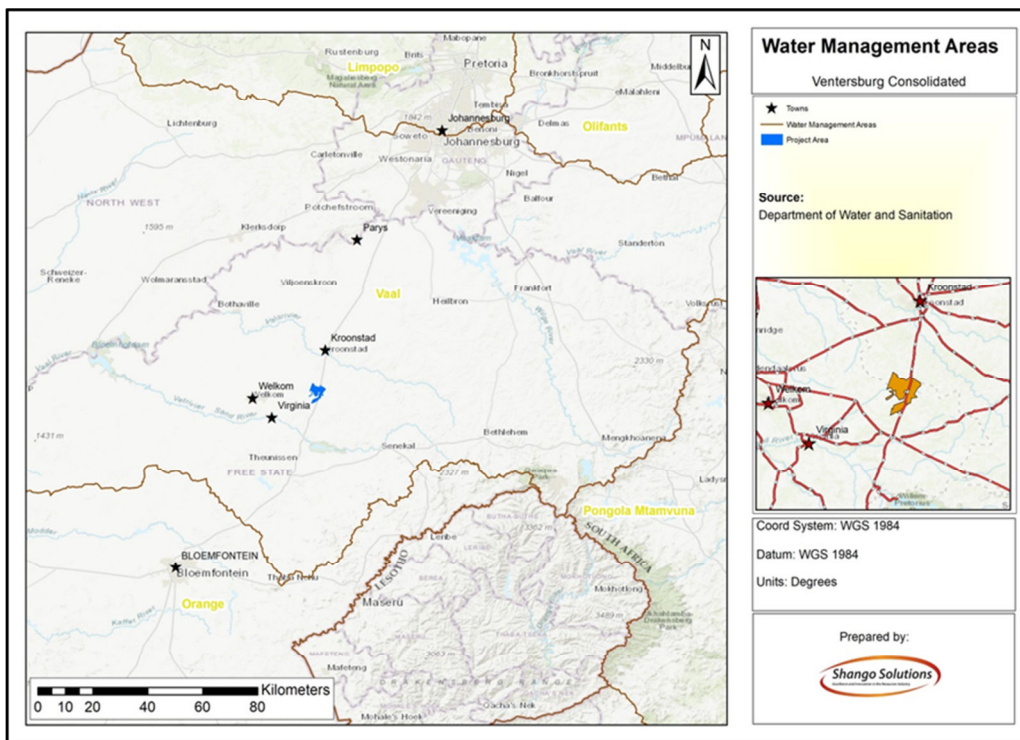


Figure 8: Water Management Areas of central and northern South Africa.

The Vaal Water Management Area comprises 12 tertiary catchment areas and the application area is situated in the Quaternary Catchment C42J (Figure 9).

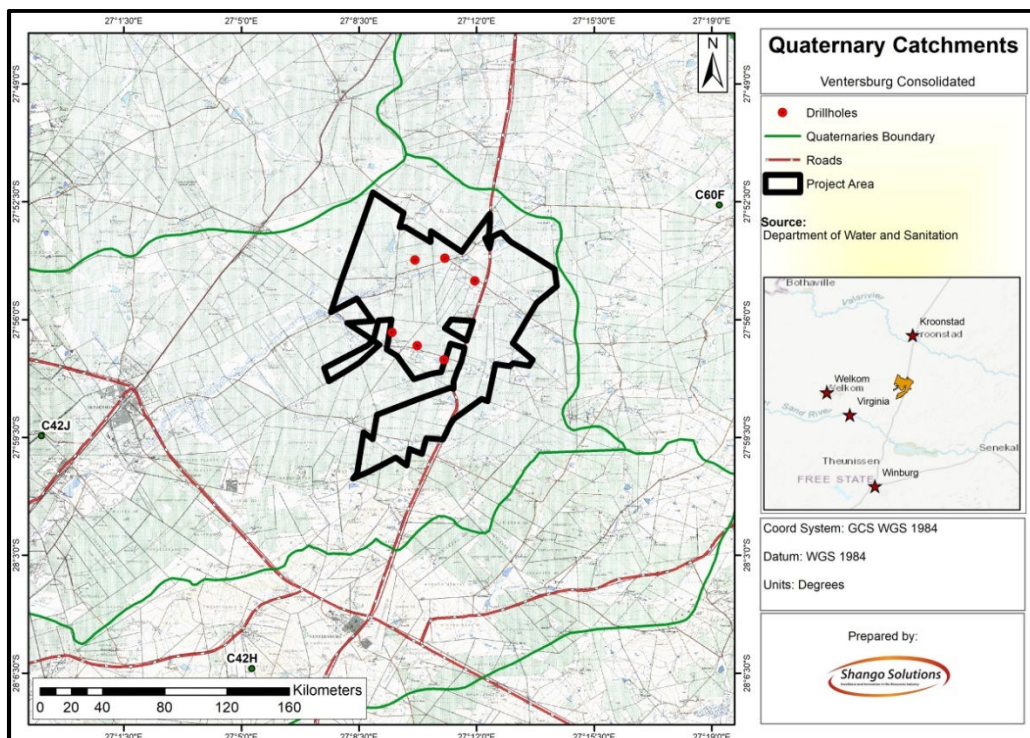


Figure 9: Quaternary Catchment Areas of the study and surroundings.

5.2.5 Flora

The application area falls within three vegetation types. These three vegetation types are Vaal-Vet Sandy Grassland, Central Free State Grassland and Highveld Salt Pans (Figure 10).

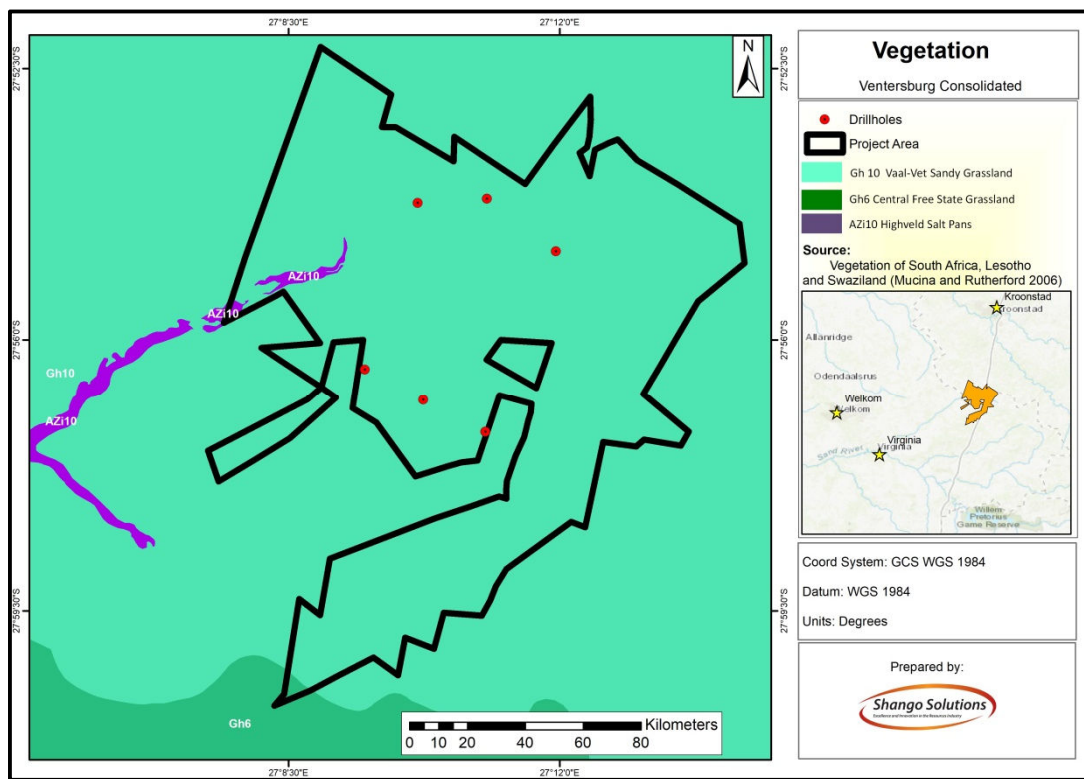


Figure 10: Vegetation of the application area.

The vegetation units are discussed in more detail below:

Vaal-Vet Sandy Grassland (Gh 10)

Vaal-Vet Sandy Grassland within the grassland biome is the most dominant vegetation unit in the project application area and it can be found in the North West and Free State Provinces, south of Lichtenberg and Venterdorp and stretching southwards to Klerksdorp, Leeudoringstad, Bothaville and Brandfort areas in the North of Bloemfontein. The vegetation unit can be found at an altitude of 1260 - 1360 metres above mean sea level (MAMSL). Vaal-Vet Sandy Grassland supports mainly low tussock grasslands with an abundant karroid element. The dominance of *Themeda triandra* is an important feature of this vegetation unit. Important taxa include:

- Graminoids: *Antheophora pubescens* (d), *Aristida congesta*, *Chloris virgata* (d), *Cymbopogon caesius* (d), *Cynodon dactylon* (d), *Digitaria argyrograpta*, *Elionurus muticus*, *Eragrostis chloromelas* (d), *E. lehmanniana* (d), *E. plana* (d), *E. tichophora* (d), *Heteropogon contortus* (d), *Panicum gilvum* (d), *Setaria Sphacelata* (d), *Themeda triandra* (d), *Targus berteronianus* (d), *Brachiaria serrata*, *Cymbopogon pospischilii*, *Digitaria eriantha*, *Eragrostis curvula*, *E. obtusa*, *E. superba*, *Panicum coloratum*, *Pogonarthria squarrosa*, *Trichoneura grandiglumis*, *Triraphis andropogonoides*
- Herbs: *Stachys spathulata* (d), *Berleria macrostegia*, *Berkheya onopordifolia* var. *onopordifolia*, *Chamaesyce inaequilatera*, *Geigeria aspera* var. *aspera*, *Helichrysum caespitium*, *Hermannia depressa*, *Hibiscus pusillus*, *Monsonia burkeana*, *Rhynchosia adenodes*, *Selago densiflora*, *Vernonia oligocephala*.
- Geophytic Herbs: *Bulbine narcissifolia*, *Ledebouria marginata*
- Succulent Herbs: *Tripteris aghillana* var. *integrifolia*

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- Low Shrubs: *Felicia muricata* (d), *Pentzia globosa* (d), *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum dregeanum*, *H. Paronychioides*, *Ziziphus zeyheriana*.

Vaal-Vet Sandy Grassland is considered **Endangered** and is a **Protected** ecosystem under the National Environmental Management Biodiversity Act, 2004 (Act 10 of 2004). Only 0.3 % of this vegetation unit is statutorily conserved within the Bloemhof Dam, Faan Meintjies, Sandveld, Schoonspruit, Soetdoring, and Wolwespruit Nature Reserves. A loss in the vegetation type is generally associated with transformed land for cultivation, for commercial crops and grazing for cattle and sheep. . Historically Gh10 covered the largest portion of the study area, but was virtually totally destroyed due to crop cultivation and other agricultural activities.

Central Free State Grassland (Gh 6)

Central Free State Grassland, also within the grassland, is found in the Free State and also marginally in the Gauteng Province. Other major settlements located within this unit include Kroonstad, Ventersburg, Steynsrus, Winburg, Lindley and Edenville. The vegetation unit can be found at an altitude of 1 300 –1 640 MAMSL. The Central Free State Grassland supports mainly short grassland. In natural condition the dominant grassland type is *Themeda triandra* while *Eragrostis curvula* and *E. chloromelas* become dominant in degraded habitats. *Dwarf karoo* bushes establish in severely degraded clayey bottomlands. Overgrazed and trampled low-lying areas with heavy clayey soils are prone to *Acacia Karoo* encroachment.

Important taxa include:

- Graminods: *Aristida adscensionis* (d), *A. congesta* (d), *Cynodon dactylon* (d), *Eragrostis chloromelas* (d), *E. curvula* (d), *E. plana* (d), *Panicum coloratum* (d), *Setaria sphaceolata* (d), *Themeda triandra* (d), *Tragus koelerioides* (d), *Agrostis lachnantha*, *Andropogon appendiculatus*, *Aristida bipartita*, *A. canescens*, *Cymbopogon pospischilii*, *Cynodon transvaalensis*, *Digitaria argyrograpta*, *Elionurus muticus*, *Eragrostis lehmanniana*, *E. micrantha*, *E. obtusa*, *E. racemosa*, *E. trichophora*, *Heteropogon contortus*, *Microchloa caffra*, *Setaria incrassata*, *Sporobolus discosporus*
- Herbs: *Berkheya onopordifolia* var. *onopordifolia*, *Chamaesyce inaequilatera*, *Conyza pinnata*, *Crabbea acaulis*, *Geigeria aspera* var. *aspera*, *Hermannia depressa*, *Hibiscus pusillus*, *Pseudognaphalium luteoalbum*, *Salvia stenophylla*, *Selago densiflora*, *Sonchus dregeanus*. Geophytic Herbs: *Oxalis depressa*, *Raphionacme dyeri*
- Succulent Herb: *Tripteris aghillana* var. *integrifolia*
- Low Shrubs: *Felicia muricata* (d), *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum dregeanum*, *Melolobium candicans*, *Pentzia globosa*

Central Free State Grassland is considered **Vulnerable**. Of the 24% conservation target, only small portions areas are subject to statutory conservation (Willem Pretorius, Rustfontein and Koppies Dam Nature Reserves) as well as some protection in private nature reserves. Almost a quarter of the area has been transformed either for cultivation or by building of dams (Allemanskraal, Erfenis, Groothoek, Koppies, Kroonstad, Lace Mine, Rustfontein and Weltevrede). No serious infestation by alien flora has been observed, but encroachment of *Dwarf Karoo* shrubs becomes a problem in the degraded southern parts of this vegetation unit.

Highveld Salt Pans (AZi 10)

Highveld Salt Pans within the inland azonal vegetation is distributed in the Northern Cape, Eastern Cape, North-West, Free State and Gauteng provinces: Pans scattered on broad Grassland/Karoo and Grassland/Savanna interface roughly between Mafikeng/Koster in the north and Britstown/Middelburg in the south. The highest

Financial Rehabilitation, Decommissioning and Closure Plan, Incorporating an Annual Rehabilitation Plan and Environmental Risk Assessment FS 30/5/1/1/3/2/1/1/10489 EM concentrations of pans are found around Dealesville, Bultfontein, Wesselsbron, Delareyville and Petrusburg. The vegetation unit can be found at an altitude of 1 000-1 600 MAMSL.

Depressions in plateau landscape contain temporary (and less frequently also permanent) water bodies. Central parts of the pans often seasonally inundated and sometimes covered by floating macrophyte vegetation. In addition, vegetation cover can develop on drained bottoms of the pans forming typical concentric zonation patterns. Along the pan edges, open to sparse grassy dwarf shrubland may develop, especially when the pan is under heavy grazing pressure.

The bottoms of the pans are usually formed by shales of the Ecca Group giving rise to vertic clays. The environment of the pans undergoes dramatic changes from freshwater systems during the wet season to saline systems as the dry season progresses and evaporation intensifies. Wind erosion is of particular significance during the dry season, when the playa basin is dry and marginal vegetation is short and sparse. Important taxa include:

- Low Shrubs: *Atriplex vestita*, *Felicia filifolia*, *F. muricata*, *Nenax microphylla*, *Nestlera conferta*, *Pentzia globosa*, *P. incana*
- Succulent Shrubs: *Salsola glabrescens* (d), *Lycium cinereum*, *Malephora herrei*, *Suaeda fruticosa*, *Titanopsis hugoschlechteri*
- Megagraminoids: *Cyperus congestus*, *Phragmites australis*, *Typha latifolia*
- Graminoids: *Chloris virgata* (d), *Cynodon dactylon* (d), *C. transvaalensis* (d), *Cyperus laevigatus* (d), *C. marginatus* (d), *Diplachne fusca* (d), *Eragrostis bicolor* (d), *E. chloromelas* (d), *E. plana* (d), *Hemarthria altissima* (d), *Juncus rigidus* (d), *Panicum coloratum* (d), *P. laevifolium* (d), *P. schinzii* (d), *Setaria incrassata* (d), *Andropogon eucomus*, *Aristida adscensionis*, *Brachiaria marlothii*, *Cyperus longus*, *C. rigidifolius*, *Echinochloa holubii*, *Eleocharis palustris*, *Enneapogon desvauxii*, *Eragrostis curvula*, *E. micrantha*, *E. obtusa*, *E. stapfii*, *Fuirena coerulescens*, *F. pubescens*, *Juncus exsertus*, *Scirpoides dioecus*, *Sporobolus albicans*, *S. fimbriatus*, *S. ioclados*, *S. tenellus*, *Tragus berteronianus*, *T. racemosus*
- Herbs: *Alternanthera sessilis*, *Amaranthus praetermissus*, *Aponogeton rehmannii*, *Atriplex suberecta*, *Chenopodium mucronatum*, *Gnaphalium declinatum*, *Mollugo cerviana*, *Phyla nodiflora*, *Platycarpha parvifolia*, *Pterodiscus speciosus*, *Senecio reptans*
- Succulent Herb: *Zygophyllum simplex*

Biogeographically Important Taxon (Highveld endemic) include:

- Herb: *Rorippa fluviatilis* var. *caledonica*
- Endemic Taxon Herb: *Gnaphalium simii*

Highveld Salt Pans are considered **Least Threatened** according to Mucina and Rutherford (2006). Of the 24% conservation target, only very small portions are statutorily conserved in the Vaalbos National Park and in the Bloemhof Dam, Soetdoring, Willem Pretorius, Barberspan (a Ramsar site) and S.A. Lombard Nature Reserves. About 4% has been transformed so far, but threats by agriculture, road building, mining and urbanisation are still increasing. Alien plants such as *Atriplex semibaccata*, *Conyza albida*, *Flaveria bidentis*, *Salsola kali*, *Schkuhria pinnata*, *Sonchus oleraceus*, *Spergularia rubra*, *Tagetes minuta*, *Verbena brasiliensis* and *Xanthium* have been recorded in the vegetation of these salt pans.

A visual reconnaissance of the study area was undertaken by ERC before surveying commenced. Different homogenous habitat units were identified and subsequently surveyed on foot and by vehicle in order to determine

the floristic composition of each. The following data was recorded:

- All identifiable indigenous and exotic plant species in each identified vegetation unit
- Sightings of faunal species
- General ecological and habitat data that may assist in the description of the biodiversity of the study area

A plotless sampling method was used to record floristic data. Taxa observed in the study area during the time of the study were recorded and included in the species lists. The floristic composition of each of the identified broad vegetation units are described and discussed. Species identification was done following reputable checklists and field guides. Where necessary, plant material was collected and/or photographs taken of specimens for identification purposes and if necessary, SANBI in Pretoria and other specialists were consulted in order to assist in species identification.

5.2.6 Fauna

A faunal assessment was conducted on a desktop level, which was supported by on-site observations. No faunal trapping or any other quantitative field species data capturing was conducted. The main focus of the faunal assessment was to include every species with the slightest chance of occurring within the site in the species lists. The characteristics of the site and the prominent features surrounding it play a key role in whether an animal would theoretically inhabit the study area. In assessing species occurrence, their approximate distribution and habitat requirements were considered. Therefore, only animal groups for which distribution data are available were considered in this assessment. Table 4 summarises the diversity of fauna that is expected to occur in the study area.

Table 4: Animal groups considered in this study along with the total number of species possibly occurring in or near the study area.

Animal group	Total species
Mammals	52
Reptiles	35
Birds	79
Frogs	14
Butterflies	63
Dragonflies / damselflies	35
Spiders	57
Scorpions	1

5.3 STAKEHOLDER ISSUES AND COMMENTS

A public participation process as required by the NEMA 2014 EIA Regulations (as amended) will be undertaken for the proposed prospecting. In this regard, please refer to Section 7 and Appendix D of the BAR for a comprehensive record of the process followed and comments received. Once comments have been received, an extract from the Comments and Responses Report (CRR) which relate to final rehabilitation, decommissioning and closure activities will be provided in this section. The comments and issues raised through the public participation will be considered and inform the compilation of this FRDCP.

5.4 ENVIRONMENTAL RISK ASSESSMENT

Section 9 of the BAR provides a detailed description of the environmental impact/risk identification and assessment (including the methodology and findings) undertaken for the proposed prospecting. This risk assessment assesses each identified environmental impact by considering the consequence of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/likelihood of the impact occurring. The BAR further considers other factors, including cumulative impacts, public concern, and potential for irreplaceable loss of resources, to determine a prioritisation factor (PF) which is applied to the Environmental Risk to determine the overall significance.

Table 5 lists the environmental impacts and risks identified and assessed in the Basic Assessment, which relate to final rehabilitation, decommissioning and closure of the prospecting. The EMPR addresses the management and mitigation of environmental impacts associated with the preceding phases whilst the annual environmental rehabilitation plan (to be prepared and reviewed annually) will provide for the planning and financial provisioning for the concurrent and progressive rehabilitation and remediation activities.

The applicable conceptual closure strategy to avoid, manage and mitigate the impacts and risks are also included in Table 5, together with the re-assessment of the environmental risk. The environmental risk assessment of the impacts associated with final rehabilitation, decommissioning and closure will inform the most appropriate closure strategy for the prospecting. It is expected that, in most cases, if all the management and mitigation measures identified in the BAR and EMPR are adhered to and successfully implemented, then no latent or residual environmental impacts will remain.

Impacts that are classified as high risk post-mitigation will be considered as latent environmental impacts and financial provision will be provided to remediate these specific impacts. Please see Section 9 for further details.

Table 5: Impact assessment for rehabilitation, decommissioning and closure.

Aspect	Impact	Suggested mitigation measures	Closure options
Site preparation and vegetation clearances	Clearance of vegetation	<ul style="list-style-type: none"> Avoid and control through implementation of EMPR mitigation measures Consideration of I&AP comments in BAR compliance with NHRA provisions and Regulations 	<ul style="list-style-type: none"> Rehabilitate disturbed areas On-going monitoring
	Pollution of soils	<ul style="list-style-type: none"> Avoid and control through implementation of EMPR mitigation measures 	<ul style="list-style-type: none"> Rehabilitate disturbed areas On-going monitoring
	Introduction of alien vegetation	<ul style="list-style-type: none"> Use of rehabilitation, immediate re-vegetation of indigenous species and rehabilitation of areas where construction is completed, rehabilitation monitoring 	<ul style="list-style-type: none"> Rehabilitate disturbed areas On-going monitoring
	Dust	<ul style="list-style-type: none"> Limit unnecessary movements and trips Apply dust suppressing techniques where dust receptors will be affected 	<ul style="list-style-type: none"> Rehabilitate disturbed areas On-going monitoring
Drilling of drillholes	Surface water	<ul style="list-style-type: none"> No invasive prospecting activities to be undertaken within 100 m of a watercourse Should any watercourse be affected, then the necessary water use license should be obtained from the Department of Water and Sanitation No ablation of site laydown areas are to be located within 100 m of a watercourse 	<ul style="list-style-type: none"> Rehabilitate disturbed areas On-going monitoring
	Groundwater	<ul style="list-style-type: none"> Where drinking water sources are to be affected then the advice of a hydrogeologist should be sought with regards to the need for plugging and casing of the prospecting drillholes 	<ul style="list-style-type: none"> Rehabilitate disturbed areas On-going monitoring
Temporary waste storage (General and hazardous waste)	Generation and disposal of waste	<ul style="list-style-type: none"> Remedy through clean-up and waste disposal Avoid and control through implementation of preventative measures 	<ul style="list-style-type: none"> Rehabilitate disturbed areas On-going monitoring

It is important to note that the environmental risk assessment will be revised and updated on an annual basis to ensure that this FRDCP remains applicable to the actual and predicted environmental impacts and risks.

5.5 ENVIRONMENTAL INDICATORS AND MONITORING

Table 6 provides a list of the identified environmental impacts identified for the rehabilitation, decommissioning and closure of the Prospecting. In addition, environmental indicators are identified for each impact, together with proposed monitoring requirements. The indicators and monitoring will aim to inform on-going rehabilitation and remediation activities. These indicators will also inform the assessment of whether the closure objectives have been adequately met.

Table 6: Environmental indicators and monitoring requirements.

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standard	Time period for implementation
Borehole closure	Decommissioning and closure	Short-term and localised	<ul style="list-style-type: none"> • All prospecting drillholes should be plugged and sealed with cement. • Cement and liquid concrete are hazardous to the natural environment on account of the very high pH of the material and the chemicals contained therein. As a result, the contractor shall ensure that <ul style="list-style-type: none"> - Concrete shall not be mixed directly on the ground - The visible remains of concrete either solid or from washings, shall be physically removed immediately and disposed of as waste. Washing of visible signs into the ground is not acceptable - All excess aggregate shall also be removed 	NWA DWF BPG	Throughout decommissioning and closure
Removal of surface infrastructure	Decommissioning	Short-term and localised	<ul style="list-style-type: none"> • All infrastructure, equipment and other items used during prospecting will be removed from the site • Compaction of soil must be avoided as far as possible. The use of heavy machinery must be restricted in areas outside of the proposed prospecting sites to reduce the compaction of soils 	MPRDA Rehabilitation Plan	Decommissioning
Removal of waste (General and hazardous waste)	Decommissioning	Small scale and localised	<ul style="list-style-type: none"> • Any excess or waste material or chemicals including drilling muds etc. must be removed from the site and must preferably be recycled (e.g. oil and other hydrocarbon waste products). Any waste materials or chemicals that cannot be recycled must be disposed of at a suitably licensed waste facility 	NWA DWF BPG	Decommissioning
Monitoring	Post-operation	All rehabilitation	<ul style="list-style-type: none"> • The post-operational monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of one (1) year unless otherwise specified by the competent authority • The monitoring activities during this period will include but are not limited to: <ul style="list-style-type: none"> - Biodiversity monitoring - Re-vegetation of disturbed areas where required • Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management 	MPRDA Rehabilitation Plan	Post -operation

5.6 CLOSURE VISION, OBJECTIVE AND TARGETS

The vision, and consequent objective and targets for rehabilitation, decommissioning and closure, aim to reflect the local environmental and socio-economic context of the project, and to represent both the corporate requirements and the stakeholder expectations.

The receiving environment within which the prospecting activities will be undertaken includes the following key land-uses:

- Wetlands
- Cultivated Fields (high and medium)
- Grassland
- Woodland/Open Bush

Stakeholders will be consulted during the public participation process for the BAR and their comments relating to closure, decommissioning and rehabilitation will be considered in terms of this document. With reference to both the environmental context of the project and the feedback from the consultation process the vision for closure is to ensure that the post closure land use aligns with the surrounding land-use and does not affect the sustained utilisation of the land. In practice the post closure land-use will depend on the pre-prospecting land-use applicable to the specific location of the invasive prospecting activities. This FRDCP aims to address the key closure objectives which are likely to remain consistent for the majority of the prospecting activities.

Driven by the closure vision and with due consideration of the project context, the following closure objectives are presented:

- Set the course for eventual ecosystem restoration, including the restoration of the natural vegetation community, hydrology, and wildlife habitats
- Prevent future environmental issues related to lateral movement through the borehole
- Protection of water resources
- Ensure that land is usable, in alignment with surrounding land-uses

5.7 ALTERNATIVE CLOSURE AND POST CLOSURE OPTIONS

There are various alternative closure and post closure options available. The identification and consideration of the most suitable alternatives are driven by, inter alia the following considerations:

- The ability of the selected alternative to adequately meet the specified closure vision and objectives
- The efficiency, viability, and practicality of the selected alternative
- The alignment with the local environmental and socio-economic context and associated opportunities and constraints

Table 7 presents some available options and alternatives related to the process of abandoning and closure of a prospecting site. This reassessment must be utilised to select the most appropriate and responsible closure option. The options in the table below that are marked with an "X" are considered the preferred options.

Table 7: Closure alternatives.

Prospecting Activity	Aspect	Options	Comment
Prospecting drillholes	Plugging	Yes	In line with the DWAF (2008) Best Practice Guideline A6: Water Management for Underground Mines, all prospecting drillholes that will not be required for later monitoring or other useful purposes should be plugged and sealed with cement to prevent possible cross flow and contamination between aquifers.
		No	The option of not plugging the borehole, but sealing with cement.
	Plugging extent	Complete	Regulations 132(3) of the MPRDA Regulations requires that the wellbore (borehole) be cemented for the full length and diameter of the borehole to surface.
		Partial/ intermittent	Due to the cost of complete cementing, there may be instances where intermittent casing could be used. This is dependent on the nature of the borehole and the geological strata.
	Surface Infrastructure	Complete removal	Regulation 132 (3) of the MPRDA Regulations requires that the surface area of a decommissioning drillhole must be clear of obstructions and equipment. In order to allow unhindered land use of the well area, it is suggested that all surface infrastructure be removed.
		Retain	Surface infrastructure would typically include the borehole, cap, flange, and /or collar. Surface infrastructure would typically remain for possible future use by the landowner or the applicant.
	Access roads	Rehabilitate	The intention is to rehabilitate the area, including the access route, to the pre-prospecting condition.
		Retain	In certain instances, the landowner may request the retention of the access route.

The annual review of this FRDCP must where applicable include an assessment and adjustment of the closure strategy to reflect the most recent technical development and industry best practice, as well as any lessons learnt from the implementation of closure on this project.

5.8 MOTIVATION FOR PREFERRED CLOSURE OPTION

The preferred closure option is as follows:

- In line with the DWAF (2008) Best Practice Guideline A6: Water Management for Underground Mines, all prospecting drillholes that will not be required for later monitoring or other useful purposes should be plugged and sealed with cement to prevent possible cross flow and contamination between aquifers
- In order to allow unhindered land-use of the prospecting area, it is suggested that all surface infrastructure be removed
- Rehabilitate access routes

It is anticipated that the closure option presented above, together with monitoring over a one (1) year post closure period, will achieve the stipulated closure objective. This closure option is in line with industry best practice and the requirements of the MPRDA Regulations.

5.9 CLOSURE PERIOD AND POST CLOSURE REQUIREMENTS

The closure period is defined as the period between the cessation of prospecting activities, and the completion of active rehabilitation actions on the applicable site. It is important to note that the nature of prospecting drilling is such that closure may be implemented for individual drillholes as and when the analysis ends.

Following successful completion of the active closure actions it is suggested that a further post closure period be assigned to allow for monitoring of the success of closure. It is anticipated that a period of one (1) year be permitted for on-going post closure monitoring. This post closure monitoring will include the following:

- Inspection of borehole plug integrity
- Vegetation composition

5.10 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations apply to this FRDCP:

- The following assumptions have been made and used as the basis for the financial provision calculations:
 - Six diamond drillholes will be drilled
 - An area of approximately 0.54 ha will be cleared for the establishment of the drill pads
 - Any access road prepared for the prospecting activities will be rehabilitated during closure
 - The closure actions and associated period will commence as soon as a borehole is abandoned
 - It is assumed that the entire length and diameter of the prospecting borehole will be plugged/cemented in the event that ground water intersects the borehole
 - Post closure land-use to resemble the pre-prospecting land-use and vegetative cover
- It is assumed that the management and mitigation measures suggested in the BAR relating to ongoing environmental management will be complied with. This includes post drilling clean-up and rehabilitation
- It is assumed that the drilling will be carried out in accordance with industry best practice

5.11 FINAL POST PROSPECTING LAND-USE

As discussed above the final post closure land-use will depend on the specific site circumstances. For the purposes of this FRDCP it is assumed that the post closure land use will be natural grassland utilised for livestock grazing and arable land.

5.12 CLOSURE ACTIONS

5.12.1 Integrated Rehabilitation and Closure Plan

The main aim in developing this rehabilitation plan is to mitigate the impacts caused by the prospecting activities and to restore land back to a satisfactory standard. It is best practice to develop the rehabilitation plan as early as possible so as to ensure the optimal management of rehabilitation issues that may arise. It is important that the project's closure plan is defined and understood before starting the process and is complementary to the

rehabilitation goals. Rehabilitation and closure objectives need to be tailored to the project at hand and be aligned with the EMPR.

The overall rehabilitation objectives for this project are as follows:

- Maintain and minimise impacts to the ecosystem within the application area
- Re-establishment of the pre-developed land capability to allow for a suitable post-prospecting land use
- Prevent soil, surface water and groundwater contamination
- Comply with the relevant local and national regulatory requirements
- Maintain and monitor the rehabilitated areas

Successful rehabilitation must be sustainable, and requires an understanding of the basic baseline environment, as well as project management to ensure that the rehabilitation program is a success.

It is noted that an application for Environmental Authorisation must be submitted for closure in accordance with Activity 22 Listing Notice 1:

The decommissioning of any activity requiring –

- I. a closure certificate in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) or
- II. A prospecting right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure.

5.12.2 Phase 1: Making Safe

In line with the DWAF (2008) Best Practice Guideline A6: Water Management for Underground Mines. All prospecting drillholes that will not be required for later monitoring or other useful purposes should be plugged and sealed with cement to prevent possible cross flow and contamination between aquifers. Cement and liquid concrete are hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein. As a result, the contractor shall ensure that:

- Concrete shall not be mixed directly on the ground
- The visible remains of concrete, either solid, or from washings, shall be physically removed immediately
- and disposed of as waste
- All excess aggregate shall also be removed

5.12.3 Phase 2: Landform Design, Erosion Control and Re-Vegetation

Landform, erosion control and re-vegetation are important parts of the rehabilitation process. Landform and land-use are closely interrelated, and the landform should be returned as closely as possible to the original landform. Community expectations, compatibility with local land-use practices and regional infrastructure, or the need to replace natural ecosystems and faunal habitats all support returning the land as closely as possible to its original appearance and productive capacity. This requires the following:

- Shape, level and de-compact (where necessary) the final landscape after removing all the project infrastructure, dress with topsoil and, where necessary, vegetate with indigenous species
- Remove access roads with no beneficial re-use potential by deep ripping, shaping and levelling after the removal and disposal of any culverts, drains, ditches and/or other infrastructure. Natural drainage patterns are to be reinstated as closely as possible

- Shape all channels and drains to smooth slopes and integrate into the natural drainage pattern
- Construct contour banks and energy dissipating structures as necessary to protect disturbed areas from erosion prior to stabilisation
- Promote re-vegetation through the encouragement of the natural process of secondary succession
- Natural re-vegetation is dependent on de-compaction of subsoils and adequate replacement of the accumulated reserves of topsoil (for example, over the borehole sites), so as to encourage the establishment of pioneer vegetation
- Remove alien and/or exotic vegetation

5.12.4 Phase 3: Monitoring and Maintenance

The post-operational monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of one (1) year unless otherwise specified by the Competent Authority.

The monitoring activities during this period will include but not be limited to:

- Biodiversity monitoring
- Re-vegetation of disturbed areas where required

Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management.

5.12.5 Post-Closure Monitoring and Maintenance

Prior to decommissioning and rehabilitation activities, a monitoring programme shall be developed and submitted to the relevant authority for approval, as a part of the Final Rehabilitation Plan. The programme is to include proposed monitoring during and after the closure of the prospecting borehole sites and related activities.

It is recommended that the post-closure monitoring include the following:

- Confirmation that any waste, wastewater or other pollutants that is generated as a result of decommissioning will be managed appropriately, as per the detailed requirements set out in the Final Rehabilitation Plan
- Confirmation that all de-contaminated sites are free of residual pollution after decommissioning
- Confirmation that acceptable cover has been achieved in areas where natural vegetation is being re-established. 'Acceptable Cover' means re-establishment of pioneer grass communities over the disturbed areas at a density similar to surrounding undisturbed areas, non-eroding and free of invasive alien plants
- Confirmation that the prospecting sites are safe and are not resulting in a pollution hazard
- Annual environmental reports will be submitted to the Designated Authority and other relevant Departments for at least one year post-decommissioning. The frequency and duration of this reporting period may be increased to include longer term monitoring, at intervals to be agreed with the Designated Authority
- The monitoring reports shall include a list of any remedial action necessary to ensure that infrastructure that has not been removed remains safe and pollution free and that rehabilitation of project sites are in a stable, weed and free condition

5.13 FINAL REHABILITATION, DECOMMISSIONING AND CLOSURE SCHEDULE

Table 8 presents the forecast schedule of actions related to the final rehabilitation, decommissioning and closure, in relation to the overall forecast prospecting schedule. It should be noted that this schedule represents cautious approach and therefore doesn't take into consideration the recommendation that final rehabilitation, decommissioning and closure may be initiated earlier in the prospecting process for individual prospecting sites.

Table 8: Timeframes for each of the proposed activities.

Name of activity	Year 1	Year 2	Year 3	Year 4	Year 5
Desktop studies and acquisition of historical data					
Data inventory and capturing					
Data synthesis and database creation					
Generation of geological models					
Location of key historical borehole core (if available)					
Re-logging and re-sampling of historical drillholes					
Drilling					
Resource estimation					

5.14 ORGANISATIONAL CAPACITY

Capacity of the following key roles and responsibilities must be provided for:

- **The Applicant:** The applicant is ultimately responsible for ensuring compliance with all the provisions of the Prospecting Right and associated plans, as well as other relevant legal requirements. The Applicant must ensure knowledge and understanding of the applicable legislation, guidelines and industry best practices. Where necessary the Applicant must appoint suitably qualified specialists, engineers, and other internal and external resources to adequately comply with the applicable commitments and requirements. Relevant commitments made and obligations contained within the legal requirements must be adequately planned and budgeted for. The Applicant must also ensure that suitable structures are put in place to effectively communicate with the affected landowners and relevant stakeholders.
- **Independent Environmental Assessment Practitioner:** This individual will be appointed to ensure compliance with the requirements of the FRDCP and specifically to undertake the following tasks:
 - Undertake the required pre-closure environmental site assessment, risk assessment, and landowner consultations
 - Prepare a site specific final closure and decommissioning plan
 - Undertake the required periodic compliance monitoring and reporting during the closure period
- **Prospecting specialist:** This individual must be a suitably qualified professional who must have relevant experience in prospecting. Key attributes must include experience and qualifications related to the technologies applicable to prospecting site closure, as well as a thorough understanding of internationally accepted closure standards and guidelines. This specialist will be responsible for ensuring that the closure plan is implemented to ensure that the risks to the environment and surrounding communities are prevented or limited.

Further education, training and capacity building is critical to ensure that the prospecting activities align with evolving internally accepted best practice and research. In this regard the Applicant must ensure that regular

review of international best practice is undertaken and where applicable implemented throughout the prospecting programme.

5.15 IDENTIFICATION OF CLOSURE PLAN GAPS

The key gaps applicable to this closure plan are as follows:

- The impact that any existing drillholes may have on the receiving environment is unknown

The following actions have been proposed to address these gaps:

- A site specific closure and decommissioning plan will be prepared for each invasive activity and will where applicable, be informed by a specialist environmental site assessment, and risk assessment, as well as a specialist assessment and plan for borehole plugging and decommissioning

Furthermore, the Financial Provisioning Regulations requires that the FRDCP be revisited, assessed, and revised on an annual basis. This annual review must aim to ensure that the gaps identified above are addressed, as applicable, and the relevant financial provisioning updated.

5.16 RELINQUISHMENT CRITERIA

Relinquishment can be defined as the formal approval by the relevant regulating authority indicating that the completion criteria for the prospecting activity have been met to the satisfaction of the authority. In this regard the relinquishment criteria are driven by the objectives of closure and consequently the indicators applicable to each impact associated with the closure and decommissioning of the prospecting. The proposed relinquishment criteria include:

- **Biodiversity and soils:** The vegetation cover of the affected areas must be consistent with surrounding vegetative cover. There must be ecosystem functionality which is consistent with the surroundings. There must be no faunal mortalities associated with the prospecting
- **Social:** There must be no unattended complaints. Where possible written confirmation from the affected landowner must be solicited confirming that outstanding issues have been addressed and closed out
- **Waste:** There must be no waste materials remaining on site

5.17 CLOSURE COST

At any time funds must be available for the amount of 10 years of the calculation of the sum of the rehabilitation calculation. The remainder of this section provides details on the proposed closure cost. The assumptions and limitations stated in Sections 5.9 and 5.16.3 also underpin the basis of this closure cost determination.

5.17.1 Closure Cost Methodology

The closure cost has been calculated through the following steps:

- Applicable prospecting activities are listed
- Applicable closure actions listed for each activity
- Cost items are listed for each action
- Cost units and rates determined for each item (where possible on the basis of actual quotations)
- Total cost is calculated

5.17.2 Closure Cost Estimation

This closure cost is based on 2018 values and will require annual reassessment, revision and escalation. Table 9 provides the detailed breakdown of the anticipated closure cost for 6 drillholes.

Table 9: Closure cost estimation.

CALCULATION OF THE QUANTUM							
Prospecting Right Applicant: Western Allen Ridge Gold Mines					Project name: Ventersburg Consolidated		
					Date: Mar-18		
No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master rate	Multiplication factor	Weighting factor 1	Amount (ZAR)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	R 13.38	1	1	R 0.00
2 (A)	Demolition of steel buildings and structures	m2	0	R 184.76	1	1	R 0.00
2 (B)	Demolition of reinforced concrete buildings and structures	m2	0	R 272.30	1	1	R 0.00
3	Rehabilitation of access roads	m2	0	R 33.05	1	1	R 0.00
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	R 320.91	1	1	R 0.00
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	R 175.05	1	1	R 0.00
5	Demolition of housing and/or administration facilities	m2	0	R 370.69	1	1	R 0.00
6	Opencast rehabilitation including final voids and ramps	ha	0	R 193,714.14	1	1	R 0.00
7	Sealing of shafts adits and inclines	m3	0	R 99.19	1	1	R 0.00
8 (A)	Rehabilitation of overburden and spoils	ha	0	R 129,142.75	1	1	R 0.00
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	R 160,844.97	1	1	R 0.00
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	R 467,170.04	1	1	R 0.00
9	Rehabilitation of subsided areas	ha	0	R 108,137.61	1	1	R 0.00
10	General surface rehabilitation:	ha	0	R 102,302.84	1	1	R 0.00
	Sealing and capping 6 drillholes	m	6	R 120.00	1	1	R 720.00
	Earthworks: backfilling excavations, reshaping and topsoil replacement	m3	3000	R 11.00	1	1	R 33,000.00
	Removal and disposal of waste	Per site	6	R 3,000.00	1	1	R 18,000.00
	Re-vegetation (apply fertilizer and seed)	ha	0.54	R 21,000.00	1	1	R 11,340.00
11	River diversions	ha	0	R 102,302.84	1	1	R 0.00
12	Fencing	m	0	R 116.69	1	1	R 0.00
13	Water management	ha	0	R 38,898.42	1	1	R 0.00
14	2 to 3 years of maintenance and aftercare	ha	0.5	R 13,614.45	1	1	R 6,807.22
15 (A)	Specialist study	Sum	0			1	R 0.00
15 (B)	Specialist study	Sum	0			1	R 0.00
							R 69,867.22
Weighting Factor 2						1	
Sub Total 1							R 69,867.22

Financial Rehabilitation, Decommissioning and Closure Plan, Incorporating an Annual Rehabilitation Plan and Environmental Risk Assessment FS 30/5/1/1/3/2/1/1/10489 EM

	1. Preliminary and General	12%	R 8,384.07
	2. Contingency	10%	R 6,986.72
	Sub Total 2		R 85,238.01
	VAT - 14%		R 11,933.32
	Grand Total		R 97,171.33
ENVIRONMENTAL SENSITIVITY	Medium	(High = H, Medium = M, Low = L)	
RISK CLASS	C	(A, B, C)	
WEIGHTING FACTOR 1	Flat	(Flat; Undulating; Rugged)	
WEIGHTING FACTOR 2	Remote	(Urban; Peri-urban; Remote)	

5.17.3 Closure Cost Assumptions and Limitations

In accordance with the Prospecting Works Programme the following activities are included, and their associated cost assumptions:

- The following assumptions have been made and used as the basis for the financial provision calculations:
 - Six diamond core drillholes will be drilled
 - An area of approximately 0.54 ha will be cleared for the establishment of the drill pads
 - Any access road prepared for the prospecting activities will be rehabilitated during closure
 - The access road prepared for the prospecting activities will be rehabilitated during closure
 - The closure actions and associated period will commence as soon as a borehole is abandoned
 - It is assumed that the entire length and diameter of the prospecting borehole will be plugged/cemented in the event that ground water intersects the borehole
 - Post closure land-use to resemble the pre-prospecting land-use and vegetative cover

5.18 MONITORING, AUDITING AND REPORTING

The requirement to monitor and audit should be carried through all phases of the proposed prospecting. In this regard the following monitoring and auditing requirements for the pre-closure phases have been specified in the BAR and EMPR (please refer to the BAR and EMPR for further detail):

- Compliance monitoring and auditing:
 - In accordance with Regulation 26 of the NEMA 2014 EIA Regulations the Competent Authority will indicate the extent and frequency of required environmental audits in any consequent Environmental Authorisations. For the purposes of this submission the following is proposed:
 - ✚ The Site Manager (normally the Project Geologist): will be responsible for daily monitoring, culminating in weekly reports which will be filed in support of an overall monthly report, which is to be submitted to the Environmental Officer
 - ✚ Compliance with the BAR & EMPR will be audited quarterly by the Environmental Officer. The officer will be responsible for quarterly site inspections and reports, culminating in the compilation of the annual audit assessment report which is to be submitted to the DMR, as per legal requirement. The results of these inspections will be documented and kept on record for the life of the prospecting operation.
- Environmental Monitoring (as detailed in the BAR and EMPR):
 - Waste management
 - Progressive rehabilitation
- Review and update of Final Rehabilitation, Decommissioning and Closure Plan:
 - In accordance with Regulation 11 of the NEMA Financial Provisioning Regulations, the Applicant must ensure annual review of the annual rehabilitation plan, the final rehabilitation decommissioning and closure plan, as well as the environmental risk assessment. This annual review must be audited by an independent auditor.

It is critical to continue monitoring through to the post- closure phase of the prospecting. The aim of this being to ensure that the objectives of the rehabilitation and closure plan are met. In this regard the following actions, to be adjusted based on the completion of the pre-closure site assessment, are proposed:

- Compliance monitoring and auditing: Annual (or as agreed) environmental reports will be submitted to the Competent authority and other relevant stakeholders for at least one year post-decommissioning. The monitoring reports shall include a list of any remedial action necessary to ensure that infrastructure that has not been removed remains safe and pollution free and that rehabilitation of project sites are in a stable, weed free condition.
- Environmental Monitoring:
 - Flora: Biodiversity assessments mid wet season should be undertaken by the ECO to monitor the rehabilitation progress with regards to flora. Confirmation that acceptable cover has been achieved in areas where natural vegetation is being re-established. 'Acceptable cover' means re-establishment of pioneer grass communities over the disturbed areas at a density similar to surrounding undisturbed areas, non-eroding and free of invasive alien plants.

6 ANNUAL REHABILITATION PLAN

The annual rehabilitation plan aims to:

- a) Review concurrent rehabilitation and remediation activities already implemented
- b) Establish rehabilitation and remediation goals and outcomes for the forthcoming 12 months, which contribute to the gradual achievement of the post-mining land use, closure vision and objectives identified in the holder's final rehabilitation, decommissioning and mine closure plan
- c) Establish a plan, schedule and budget for rehabilitation for the forthcoming 12 months
- d) Identify and address shortcomings experienced in the preceding 12 months of rehabilitation
- e) Evaluate and update the cost of rehabilitation for the 12 month period and for closure, for purposes of supplementing the financial provision guarantee or other financial provision instrument

The proposed prospecting schedule (Table 3) indicates that no invasive work will be commenced within the first 36 months. Activities during the first, second and third year include desktop studies and acquisition of historical data, data inventory and capturing, data synthesis and database creation, generation of geological models, location of key historical drillholes (if available) and re-logging and re-sampling of historical drillholes. As such, no rehabilitation or remediation will be planned for this period and consequently no financial provision can be calculated at present.

Within the fourth and fifth years of the Prospecting Work Programme, drilling is planned. The nature of drilling is such that closure may be implemented for individual sites as and when the analysis is complete, or alternatively at the end of the prospecting programme. It is therefore anticipated that the annual review of the annual rehabilitation plan, as required under Section 11 of the NEMA GNR 1147, will consider the more detailed prospecting programme at that time and provide for, schedule and budget for rehabilitation for the forthcoming 12 month period.

7 ENVIRONMENTAL RISK ASSESSMENT – LATENT AND RESIDUAL ENVIRONMENTAL IMPACTS

According to the Financial Provisioning Regulations (2015) the objective of the environmental risk assessment report that relates to latent and residual impacts is to:

- a) Ensure timeous risk reduction through appropriate interventions
- b) Identify and quantify the potential latent environmental risks related to post closure

- c) Detail the approach to managing the risks
- d) Quantify the potential liabilities associated with the management of the risks
- e) Outline monitoring, auditing and reporting requirements

This section of the report aims to address these objectives separately in cases where they have not been considered in previous sections.

7.1 THE ASSESSMENT PROCESS USED AND DESCRIPTION OF LATENT ENVIRONMENTAL RISK

Section 9 of the BAR provides a detailed description of the environmental impact/risk identification and assessment (including the methodology and findings) undertaken for the proposed prospecting. Further details of the risk assessment methodology are detailed in the Environmental Risk Assessment of this report. As mentioned, the BAR and EMPR have identified mitigation measures which, once implemented successfully, will result in the avoidance or acceptable reduction of the associated impact.

The drivers that could result in the manifestation of the latent risk are largely defined by the specifics of the site location and the geological profile surrounding each specific site. It is suggested that further investigations are conducted during annual revisions to provide more clarity. These investigations must include regular revision of the environmental risk assessment and consequently inform the responsible management of latent and residual impacts.

7.2 MANAGEMENT ACTIVITIES, COSTING AND MONITORING REQUIREMENTS

New international best practice guidelines that may be developed in the future will be considered in all annual updates of the financial provisions and changes to the risk assessment will be reported on. In addition, monitoring results and auditing reports as described above for one year after closure will inform the revised risk assessment further.

8 REFERENCES

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