



Seriti Coal (Pty) Ltd: New Denmark Colliery

**Basic Assessment Report for proposed
construction of the ventilation shaft
access road**

DMRE Reference number: 74MR
Report date: August 2020

SHANGONI
Management Services (Pty) Ltd

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PART A:

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1 Details of project applicant and environmental assessment practitioner

1.1 Details of project applicant

Name of operation	New Denmark Colliery
Applicant	Seriti Coal (Pty) Ltd
Postal address	Private Bag X2022, Standerton
Responsible person	Mike Lawson
Telephone no.	+27 (0)17 749 0660
Fax no.	+27 (0)17 749 0113
e-mail address	Mike.lawson@seritiza.com
Company registration no.	2016/416619/07

1.2 Details of the environmental assessment practitioner

EAP	Shangoni Management Services (Pty) Ltd.: Minnette Le Roux and Olwethu Mungwe
Tel No	(012) 807 7036
Fax No	(012) 807 1014
e-mail Address	minnette@shangoni.co.za / olwethu@shangoni.co.za

1.3 Expertise of the environmental assessment practitioner

Name and Surname	Qualifications and summary of experience
Olwethu Mungwe	Olwethu is junior environmental consultant. He obtained his B.Sc. Environmental Science degree, with Environmental Science and Biology as his two majors from the University of KwaZulu-Natal and is a registered Cand.Sci.Nat. Olwethu assists with the compilation of various reports required as part of Environmental Authorisation processes, including amongst other; Environmental Impact Assessments, Scoping Reports, Basic Assessments, Environmental Management Plans and Environmental Management Programmes. He also has



Name and Surname	Qualifications and summary of experience
	experience in water sampling, public participation and translating public documentation.
Minnette Le Roux	<p>Minnette is a senior environmental consultant in the Mining Department with over 12 years consulting experience. She obtained her B.Sc. Hons degree from the University of Pretoria and is a registered Pr.Sci.Nat. She has been project manager and coordinator on a number of large environmental authorisations for predominantly industrial and mining clients. Minnette has extensive integrated environmental management experience, including amongst other; Environmental Impact Assessments, Scoping Reports, Basic Assessments, Environmental Management Plans, Environmental Management Programmes, Integrated Water Use Licence Applications, Integrated Water and Waste Management Plans, Waste Tyre Abatement plans, Biodiversity Action Plans, Screening Reports and Gap-Analysis, Waste Management Licence Applications, Mining and Prospecting Right Applications and various other Application Forms as part of the Environmental Application Process.</p> <p>She also has experience in Environmental Management Programme Report Performance Assessments and Environmental Authorisation Compliance Audits, Legal Compliance Audits, Water Use Licence Compliance Audits, Regulation GN 704 Audits and Environmental Management Systems Audits (ISO 14001) for the mining sector.</p>

2 Description of the property

Table 1: Description of the properties applicable to the proposed project

Fame name	Portion 6 of the farm Meyersvallei 354 IS
Application area (ha)	0.70 hectares
Magisterial district	Lekwa Local Municipality and Gert Sibanda District Municipality
Distance and direction from nearest town	25 km to the south south-east of Secunda 25 km north north-east of Standerton 30 km west of Morgenzon 33 km south south-west of Bethal
21-digit Surveyor General code for each farm portion	TOIS00000000035400006



3 Locality of the proposed project

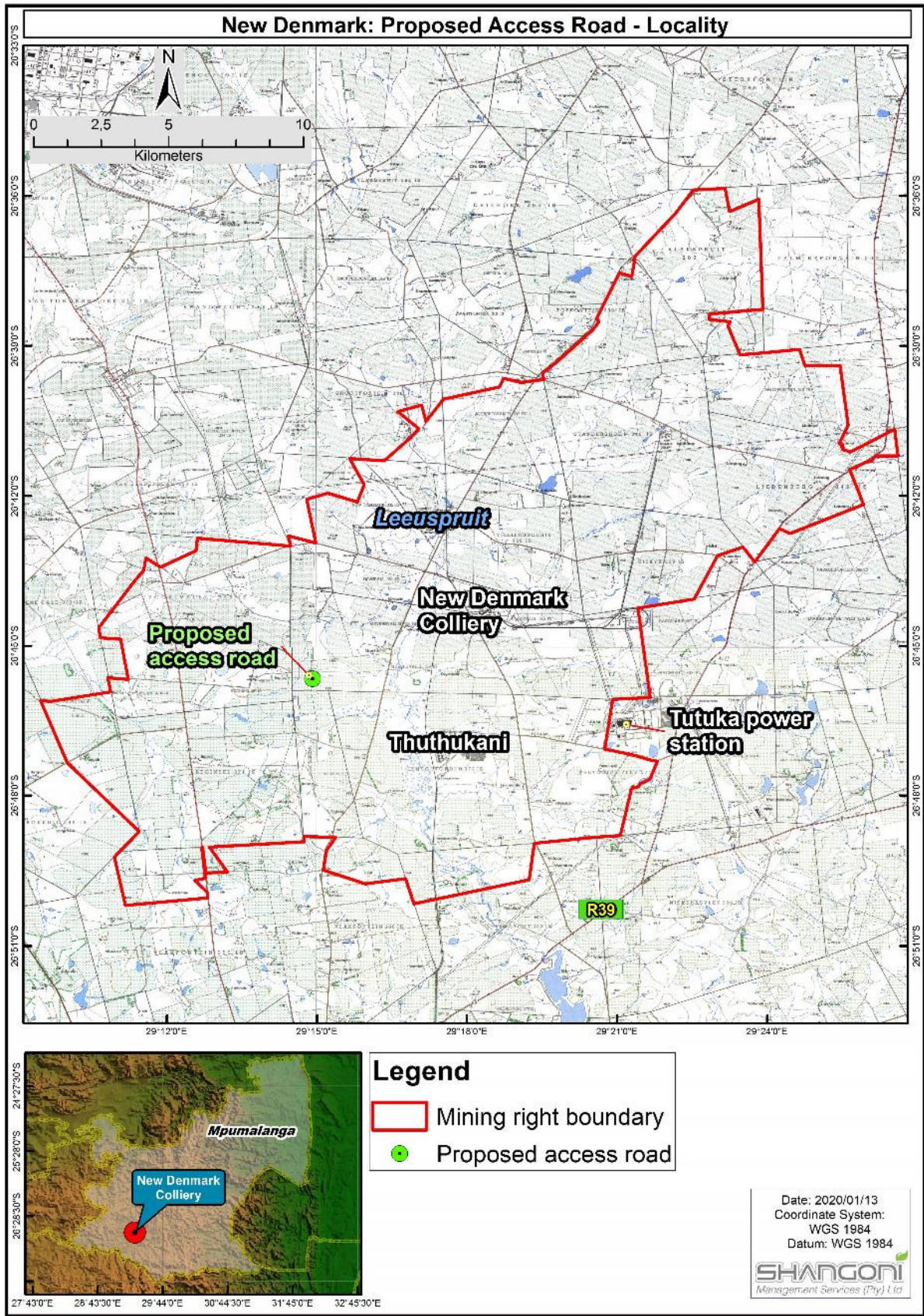


Figure 1: Locality map



4 Description of the scope of the proposed overall activity

The proposed ventilation shaft access road (“the proposed project”) will trigger the following authorisations:

An Environmental Authorisation (“EA”) for listed activities contained in the Environmental Impact Assessment Regulations Listing Notice 1 of 2014 (GN R983 of 4 December 2014) (“GNR 983”), as amended and published in terms of Sections 24(2), 24 (5), 24D, 44 and 47(A) (1) (b) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (“NEMA”), as amended.

For the EA, a Basic Assessment (“BA”) will be required in compliance with the National Environmental Management Act, 1998 (Act No. 107 of 1998) (“NEMA”) and the NEMA Environmental Impact Assessment Regulations, 2014 (GN R982 of 4 December 2014) (“GN R982”), as amended.

4.1 Listed and specified activities

Table 2: Activities and listed activities associated with the proposed project

Name of activity	Aerial extent of the activity (Ha or m ²)	Listed activity Mark with an x where applicable or affected.	Applicable listing notice (GNR 983, GNR 984 or GNR 5985)
The construction and utilisation of the ventilation shaft access road.	10 m width and 700 m length (7000 m ²)	X	<p><u>Activity 12(ii)(a) and 12(ii)(c) of Listing Notice 1 (GNR 983 of 4 December 2014, as amended):</u></p> <p><i>The development of—</i></p> <p>(ii) <i>infrastructure or structures with a physical footprint of 100 square metres or more;</i></p> <p><i>where such development occurs -</i></p> <p>(a) <i>within a watercourse;</i></p> <p>(c) <i>if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.</i></p> <hr/> <p><u>Activity 19 of Listing Notice 1 (GNR 983 of 4 December 2014, as amended):</u></p> <p><i>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.</i></p>



Name of activity	Aerial extent of the activity (Ha or m ²)	Listed activity Mark with an x where applicable or affected.	Applicable listing notice (GNR 983, GNR 984 or GNR 5985)
The utilisation of the access road.	10 m width and 700 m length (7000 m ²)	N/A	No listed or specified activities are triggered by the utilisation of the access road.

4.2 Description of the activities to be undertaken

New Denmark Colliery (“NDC”) is an underground mine situated in the Mpumalanga Province of South Africa, and has been operational since 1983, extracting coal through both bord-and-pillar and longwall mining methods. The mine lies approximately 25 km to the south south-east of Secunda, 25 km north north-east of Standerton, 30 km west of Morgenzon and 33 km south south-west of Bethal. NDC falls under the jurisdiction of the Lekwa Local Municipality, which is part of the Gert Sibanda District in the Mpumalanga Province.

NDC proposes to construct an access road leading to the new ventilation shaft to improve the ventilation systems. The proposed access road will cross and be located within a watercourse (unchanneled valley bottom wetland). The road will be a gravel road of 10 m wide and 700 m in length. The crossing will require for a bridge and culverts to be constructed. The site for the proposed access road is located within the NDC Mining Right area (“MRA”) but the surface rights belong to a farmer. A servitude agreement will be done in consultation with the farmer. Refer to the figure below for the location of the proposed project.



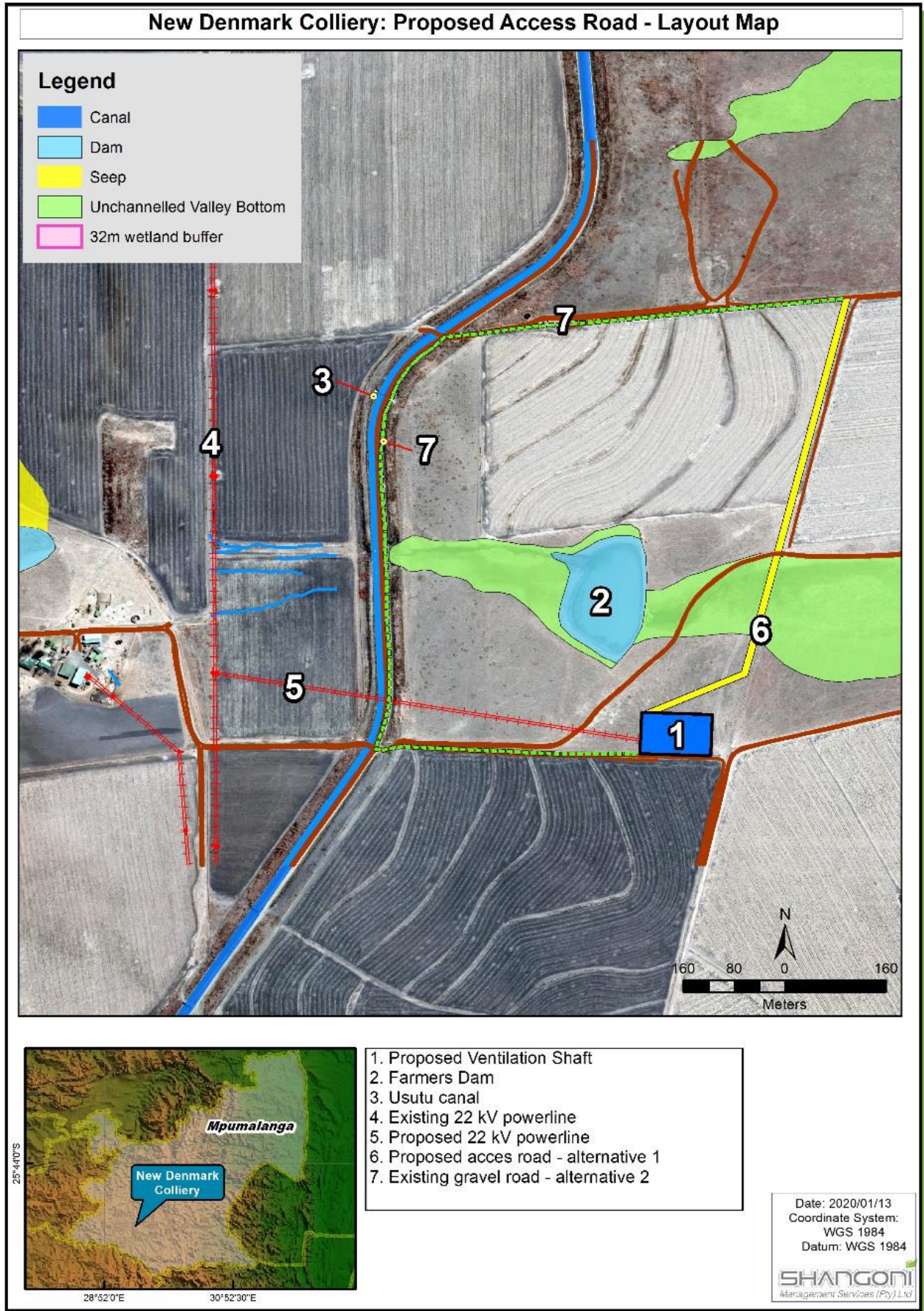


Figure 2: Layout map.



5 Policy and Legislative Context

The following table is a summary of the policy and legislative context applicable to the proposed development.

Table 3: Policy and legislative context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT
<p>The Constitution of the Republic of South Africa (1996).</p>	<p>Throughout the whole document</p>	<p>The Constitution of the Republic of South Africa was considered and applied to throughout the Basic Assessment Report (“BAR”), as the Constitution states that everyone has the right; (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that; (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.</p>
<p>The Promotion of Access to Information Act, 2000(Act No. 2 of 2000).</p>	<p>Throughout the whole document</p>	<p>Without access to information, a person may be unable to determine whether or not his or her right to just administrative action (or to an environment not harmful to human health or wellbeing or, for that matter, any other Constitutional right) has been infringed. The purpose of the Promotion of Access to Information Act (“PAIA”) is to give effect to the Constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights, and to provide for matters connected therewith. In addition to providing access to information, cognisance should be taken that PAIA also makes provision for the refusal of access to information that is deemed to be of a sensitive, confidential or classified nature. This is captured under Chapter 4 of part 2 and 3 of PAIA.</p>
<p>The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)</p>	<p>Throughout the whole document</p>	<p>The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (“MPRDA”) was passed in order to make provision for equitable access to and sustainable development of the nation’s mineral and petroleum resources, and to provide for matters connected therewith. The preamble to the MPRDA inter alia affirms the State’s obligation to:</p>



APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT
		<ul style="list-style-type: none"> • Protect the environment for the benefit of present and future generations; • Ensure ecologically sustainable development of mineral and petroleum resources, and; • The aforesaid MPRDA preamble affirms the general right to an environment provided for in section 24 of The Constitution of the Republic of South Africa, Act 108 of 1996 (then Constitution). <p>The national environmental management principles provided for in section 2 of the National Environmental Management Act (“NEMA”), Act No. 107 of 1998 apply to all prospecting and mining operations and any matter relating to such operation. These principles apply throughout the Republic to the actions of all organs of state including, inter alia, the Department of Mineral Resources and Energy (“DMRE”) that may significantly affect the environment. Any prospecting or mining operation must be conducted in accordance with generally accepted principles of sustainable development by integrating social, economic and environmental factors into the planning and implementation of prospecting and mining projects in order to ensure that exploitation of mineral resources serves present and future generations, promote economic and social development. The Basic Assessment Report and Environmental Management Programme is compiled in terms of the requirements of the MPRDA.</p>
<p>The National Environmental Management Act, 1998 (Act No. 107 of 1998).</p> <p>The Environmental Impact Assessment Regulations, R. 982 dated December 2014, and amended.</p> <p>The Environmental Impact Assessment Regulations, R. 983 dated December 2014, and amended.</p>	<p>Throughout the whole document</p>	<p>The overarching principle of the National Environmental Management Act 1998 (Act 107 of 1998) (“NEMA”) is sustainable development. It defines sustainability as meaning the integration of social, economic and environmental factors into planning, implementation and decision making so as to ensure the development serves present and future generations. Section 2 of the provides for National Environmental Management Principles. These principles include:</p> <ul style="list-style-type: none"> • Environmental management must place people and their needs at the forefront of its concern. • Development must be socially, environmentally and economically sustainable. • Environmental management must be integrated, acknowledging that all



APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT
		<p>elements of the environment are linked and interrelated.</p> <ul style="list-style-type: none"> • Environmental justice must be pursued. • Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing must be pursued. <p>Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.</p> <p>The participation of all Interested and Affected Parties (“I&APs”) in environmental governance must be promoted.</p> <p>Decisions must take into account the interests, needs and values of all I&APs.</p> <p>The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.</p> <p>Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.</p> <p>The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people’s common heritage.</p> <p>The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.</p> <p>Section 24 of the NEMA, headed “Environmental Authorisations” sets out the provisions which are to give effect to the general objectives of Integrated Environmental Management (“IEM”), and laid down in Chapter 5 of the NEMA. In terms of section 24(1), the potential impact on the environment of listed activities must be considered, investigated, assessed and reported on to the competent authority charged by the NEMA with granting of the relevant environmental authorisation.</p> <p>On 04 December 2014, the Department of Environmental Affairs (“DEA”) published the</p>



APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT
		<p>2014 NEMA Environmental Impact Assessment (“EIA”) Regulations and listed activities in Government Gazette No. 38282, which was amended in 2017.</p> <p>The proposed development involves ‘listed activities’, as identified in terms of the NEMA read with the Environmental Impact Assessment Regulations of 2014. In terms of section 24(2) and 24D of the NEMA no person may commence an activity listed or specified in terms of the act unless the competent authority has granted an environmental authorisation for the activity.</p> <p>The construction of activities will follow a Basic Assessment process under NEMA. The Listing Notice 1 activities are applied for the proposed construction of access road.</p>
<p>Guideline on Need and Desirability in terms of the Environmental Impact Assessment (“EIA”) Regulations, 2010. Government Notice 891 of 2014</p>	<p>Section 6 (Part A) of this document</p>	<p>The need and desirability were assessed for the proposed access road, and are discussed in Section 6 below in terms of the required format contained in the Guideline on Need and Desirability (GN 891 of 2014).</p>
<p>Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector.</p>	<p>Chapters E, F and L of Part 7.4.1 of this document</p>	<p>Biodiversity related to the proposed access road leading to the new ventilation shaft were considered when sites were selected, and alternatives considered.</p>
<p>The National Water Act (Act No. 36 of 1998, as amended).</p>	<p>Chapter G and H of Part 7.4.1 of this document</p>	<p>The access road will require a General Authorisation (“GA”), as per the outcome of the GN 509 risk assessment that was undertaken. The GA will be applied for.</p>
<p>Regulations on use of water for mining and related activities aimed at the protection of water resources published in terms of the National Water Act under Government Notice 704 of 4 June 1999 (GN R704).</p>	<p>Part 9 and Chapter G of Part 7.4.1 of this document</p>	<p>Storm water management measures, in compliance to GN R704, will be implemented at the proposed access gravel road.</p>
<p>The National Environmental Management: Biodiversity (Act 10 of 2004, as amended).</p>	<p>Chapter E, F and L of Part 7.4.1 of this document</p>	<p>Biodiversity related to the proposed access road were considered when sites were selected, and alternatives considered. No permits and/or licences in terms of National Environmental Management: Biodiversity (Act 10 of 2004, as amended) will be required for the proposed activities.</p>
<p>Alien and Invasive Species Regulations (GN R598 dated 2014).</p>		<p>The occurrence of alien and invasive species will be assessed and mitigated (in accordance to these regulations) during the construction</p>



APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT
Conservation of Agricultural Resources (Act 43 of 1983).		<p>and operational phases of the proposed access road that leads to the new ventilation shaft.</p> <p>Erosion potential will be assessed and mitigated (in accordance to this act) during the construction and operational phases of the proposed access road.</p>
SABS Code of Practice 0103 of 2008: The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication. SABS Code of Practice 0328 of 2008: Environmental Noise Impact Assessments.	Chapter J of Part 7.4.1 of this document	The SABS Code of Practice 0103 will be taken into account when the mitigation measures for the proposed access road are formulated.
National Heritage Resources Act (Act No. 25 of 1999, as amended).	Chapter K of Part 7.4.1 of this document	The proposed access road will be constructed 70 m away from the graves located close to the proposed site.



6 Need and desirability of the proposed activities

6.1 Need and Desirability in terms of the Guideline on Need and Desirability, 2017

In 2017, the Department of Environmental Affairs published an Integrated Environmental Management Guideline, the Guideline on Need and Desirability. The following table indicates on how the guideline requirement were considered in this Basic Assessment Report (“BAR”):

Table 4: Need and desirability of the proposed project

Requirement	Part where requirement is addressed/response
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?¹	The proposed project will have a minimal impact on the ecological integrity of the area as the area selected for the proposed access road will be located on previously ploughed lands. Refer to Chapters E, F and L of Part 7.4.1 of this document and Part 7.5 for potential impacts.
1.1 How were the following ecological integrity considerations taken into account?	
1.1.1 <i>Threatened Ecosystems²</i>	
1.1.2 <i>Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure³</i>	
1.1.3 <i>Critical Biodiversity Areas (“CBAs”) and Ecological Support Areas (“ESAs”).</i>	
1.1.4 <i>Conservation targets</i>	
1.1.5 <i>Ecological drivers of the ecosystem.</i>	
1.1.6 <i>Environmental Management Framework.</i>	The Lekwa Local Municipality’s Integrated Development Plan 2018/19, states that two-thirds of the Lekwa economy is mining, trade, community services and manufacturing. Regionally mining accounts for 11.2% in the Lekwa region.
1.1.7 <i>Spatial Development Framework.</i>	

¹ Section 24 of the Constitution and section 2(4)(a)(vi) of NEMA refer.

² Must consider the latest information including the notice published on 9 December 2011 (Government Notice No. 1002 in Government Gazette No. 34809 of 9 December 2011 refers) listing threatened ecosystems in terms of Section 52 of National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

³ Section 2(4)(r) of NEMA refers.



Requirement	Part where requirement is addressed/response
	The proposed activities will have minimal impact on the ecological integrity of the area.
<p>1.1.8 <i>Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.)</i>⁴</p>	The proposed activities are situated within the Highveld Priority Area, one of the three declared airshed priority areas. The anticipated emissions (i.e. methane gas (CH ₄)) from the vehicle engines during the construction will have minimal contribution to greenhouse gas emissions released into the atmosphere. The impacts will be further discussed and assessed in greater detail as part of the Impact risk assessment in section 7.5 and in the Environmental Management Programme section of this document.
<p>1.2 How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?⁵</p>	The preliminary potential impacts that have been identified and may occur as a result of the proposed activities have been discussed in Part 7.5 of this document.
<p>1.3 How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?⁶</p>	
<p>1.4 How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting)</p>	The proposed access road will be constructed 70 m away from the graves located close to the proposed site. Refer to Chapter K of section 7.4.1. Refer to Part 7.5 for the potential impacts on the different aspects of the environment. Refer to section 1.4.4 of Part B for the mitigation measures to be applied in minimising the impact to the graves.

⁴ Section 2(4)(n) of NEMA refers

⁵ Section 24 of the Constitution and Sections 2(4)(a)(i) and 2(4)(b) of NEMA refer.

⁶ Section 24 of the Constitution and Sections 2(4)(a)(ii) and 2(4)(b) of NEMA refer



Requirement	Part where requirement is addressed/response
<p>the impacts? What measures were explored to enhance positive impacts?⁷</p>	
<p>1.6 How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?⁸</p>	<p>The proposed access road in connection with the ventilation shaft will be in support of the underground coal mining at NDC. Coal is considered to be a non-renewable resource. The life of mine of NDC is for another 20 years when most of the coal reserves will be mined.</p>
<p>1.7 How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?⁹</p>	<p>The potential impacts that may occur as a result of the proposed activities have been identified and discussed in Part 7.5. Refer to section 1.4.4 of Part B for the mitigation measures to be applied.</p>
<p><i>1.7.1 Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. dematerialised growth)? (note sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)</i></p>	<p>The 20-year life of mine will maximise the utilisation of coal resources within the NDC's Mining Right.</p>

⁷ Section 24 of the Constitution and Sections 2(4)(a)(iii) and 2(4)(b) of NEMA refer.

⁸ Section 24 of the Constitution and Sections 2(4)(a)(v) and 2(4)(b) of NEMA refer

⁹ Section 24 of the Constitution and Sections 2(4)(a)(vi) and 2(4)(b) of NEMA refer



Requirement	Part where requirement is addressed/response
1.7.2 Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)	
1.7.3 Do the proposed location, type and scale of development promote a reduced dependency on resources?	
1.8 How were a risk-averse and cautious approach applied in terms of ecological impacts? ¹⁰	<p>The proposed access road will have a minimal impact on the ecological integrity of the area. Refer to Chapters E, F and L of Part 7.4.1 of this document and Part 7.5 for potential impacts.</p> <p>A conservative approach in terms of the identification and assessing of environmental impacts associated with the proposed project is included in section 7.5 and section 8 of Part A, and the Environmental Management Programme section.</p>
1.8.1 What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Refer to section 16 of Part A of this document.
1.8.2 What is the level of risk associated with the limits of current knowledge?	The level of risk associated with the limits of current knowledge can be considered low. The potential risks have been identified in Part 7.5 and will be further assessed in detail in section 8 and in the Environmental Management Programme section of part B of this document.
1.8.3 Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	
1.9 How will the ecological impacts resulting from this development impact on people's environmental right in terms following: ¹¹	
1.9.1 Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not	The potential impacts that may occur as a result of the proposed activities have been identified and discussed in Section 7.5 of Part A. The impacts have also been assessed and mitigation measures were explored to minimise and remediate the impacts.

¹⁰ Section 24 of the Constitution and Section 2(4)(a)(vii) of NEMA refer.

¹¹ Section 24 of the Constitution and Sections 2(4)(a)(viii) and 2(4)(b) of NEMA refer



Requirement	Part where requirement is addressed/response
<i>possible, to minimise, manage and remedy negative impacts?</i>	
1.9.2 <i>Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?</i>	
1.10 Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	
1.11 Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	
1.12 Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations? ¹²	Alternatives identified have been described in section 7.1 of part A.
1.13 Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area? ¹³	The positive and negative cumulative impacts have been described in Section 8 of Part A of this document.
2. "Promoting justifiable economic and social development"¹⁴	
2.1 What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?	
2.1.1 <i>The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans,</i>	The Lekwa Local Municipality's Integrated Development Plan 2018/19, states that two-thirds of the Lekwa economy is mining, trade,

¹² Section 2(4)(b) of NEMA refer

¹³ Regulations 22(2)(i)(i), 28(1)(g) and 31(2)(1) in Government Notice No. R. 543 refer

¹⁴ Section 24 of the Constitution refers.



Requirement	Part where requirement is addressed/response
<i>frameworks of policies applicable to the area,</i>	community services and manufacturing. Regionally mining accounts for 11.2% in the Lekwa region.
2.1.2 <i>Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),</i>	The proposed access road will continue to contribute to the Socio Economy in the area as mining of coal can continue.
2.1.3 <i>Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and</i>	
2.1.4 <i>Municipal Economic Development Strategy (“LED Strategy”).</i>	
2.2 Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	
2.2.1 <i>Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?</i>	
2.3 How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities? ¹⁵	
2.4 Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? ¹⁶ Will the impact be socially and economically sustainable in the short- and long-term?	
In terms of location, describe how the placement of the proposed development will: ¹⁷	
2.4.1 <i>result in the creation of residential and employment opportunities in close proximity to or integrated with each other,</i>	This application relates to the proposed access road that will assist in further allowing the minimum ventilation standards to be maintained since the existing ventilation system in the underground workings is inadequate and incapable to sustain its functioning. Mining of
2.4.2 <i>reduce the need for transport of people and goods,</i>	

¹⁵ Section 2(2) of NEMA refers

¹⁶ Sections 2(2) and 2(4)(c) of NEMA refers.

¹⁷ Section 3 of the Development Facilitation Act, 1995 (Act No. 67 of 1995) (“DFA”) and the National Development Plan refer



Requirement	Part where requirement is addressed/response	
2.4.3 result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	coal that will continue to contribute to the Socio Economy in the area as it will continue to provide job employment to local people.	
2.4.4 compliment other uses in the area,		
2.4.5 be in line with the planning for the area,		
2.4.6 for urban related development, make use of underutilised land available with the urban edge,		
2.4.7 optimise the use of existing resources and infrastructure,		
2.4.8 opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),		
2.4.9 discourage “urban sprawl” and contribute to compaction/densification,		
2.4.10 contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,		
2.4.11 encourage environmentally sustainable land development practices and processes,		The proposed access road will have minimal impact on the proposed area. Most of the impacts will take place during the construction phase. Detailed management and mitigation measures have been included in section 1.4.4 of Part B.
2.4.12 take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),		Refer to section 7.1 for details of alternatives.
2.4.13 the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),	This application relates to the proposed access road that will assist in further allowing the minimum ventilation standards to be maintained since the existing ventilation system in the underground workings is inadequate and incapable to sustain its functioning mining of coal	
2.4.14 impact on the sense of history, sense of place and heritage of the area and the		



Requirement	Part where requirement is addressed/response
<i>socio-cultural and cultural-historic characteristics and sensitivities of the area, and</i>	that will continue to contribute to the Socio Economy in the area.
2.4.15 <i>in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?</i>	A conservative approach will be followed in terms of the identification and assessing of environmental impacts associated with the proposed project
2.5 How were a risk-averse and cautious approach applied in terms of socio-economic impacts? ¹⁸	
2.5.1 <i>What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?¹⁹</i>	
2.5.2 <i>What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?</i>	The level of risk associated with the limits of current knowledge is considered to be low.
2.5.3 <i>Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?</i>	
2.6 How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following	
2.6.1 <i>Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?</i>	No negative impacts on the socio-economy as a result of the proposed project have been identified. This application will continue to contribute to the Socio Economy in the area.
2.6.2 <i>Positive impacts. What measures were taken to enhance positive impacts?</i>	Refer to Part 7.7 of this report for an identification of the positive impacts.
2.7 Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in	The preliminarily identified impacts of the proposed activities are presented in Part 7.5 of this document.

¹⁸ Section 2(4)(a)(vii) of NEMA refers

¹⁹ Section 24(4) of NEMA refers



Requirement	Part where requirement is addressed/response
ecological impacts (e.g. over utilisation of natural resources, etc.)?	
2.8 What measures were taken to pursue the selection of the “best practicable environmental option” in terms of socio-economic considerations? ²⁰	
2.9 What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? ²¹ Considering the need for social equity and justice, do the alternatives identified, allow the “best practicable environmental option” to be selected, or is there a need for other alternatives to be considered?	Refer to Part 7.1 of this report for an assessment of the alternatives identified and their potential impacts on the social environment.
2.10 What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination? ²²	Refer to point 2.6 (of this table) above.
2.11 What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development’s life cycle? ²³	The identification of the potential impacts has been presented in Part 7.5 below. The potential impacts are further described and assessed in detail and the significance determined in section 8. Mitigation measures are also provided for each potential impact that may occur in the Environmental Management Programme section in part B.
2.12 What measures were taken to:	
<i>2.12.1 ensure the participation of all interested and affected parties,</i>	Refer to the Public Participation details attached hereto as Annexure D.

²⁰ Section 2(4)(b) of NEMA refers.

²¹ Section 2(4)(c) of NEMA refers.

²² Section 2(4)(d) of NEMA refers.

²³ Section 2(4)(e) of NEMA refers.



Requirement	Part where requirement is addressed/response
2.12.2 provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, ²⁴	
2.12.3 ensure participation by vulnerable and disadvantaged persons, ²⁵	
2.12.4 promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means, ²⁶	
2.12.5 ensure openness and transparency, and access to information in terms of the process, ²⁷	
2.12.6 ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge ²⁸ , and	
2.12.7 ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were being promoted? ²⁹	Refer to the Public Participation details attached hereto as Annexure D. The Public Participation presents the detail of all Interested and Affected Parties (“I&APs”) that were identified, how the I&APs were notified and involved in the process, any issues and concerns raised by the I&APs, and the final results of the Public Participation Process.
2.13 Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)? ³⁰	

²⁴ Section 2(4)(f) of NEMA refers

²⁵ Section 2(4)(f) of NEMA refers.

²⁶ Section 2(4)(h) of NEMA refers.

²⁷ Section 2(4)(k) of NEMA refers.

²⁸ Section 2(4)(g) of NEMA refers.

²⁹ Section 2(4)(q) of NEMA refers.

³⁰ Section 2(4)(g) of NEMA refers.



Requirement	Part where requirement is addressed/response
<p>2.14 What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?³¹</p>	<p>All contractors, sub-contractors and workers will attend compulsory environmental awareness training and inductions. This training will highlight the dangers associated with the workplace. Procedures relating to environmental risks will also be put in place and will be regularly updated.</p>
<p>2.15 Describe how the development will impact on job creation in terms of, amongst other aspects</p>	
<p>2.15.1 <i>the number of temporary versus permanent jobs that will be created,</i></p>	<p>As mentioned previously, this proposed project relates to the proposed access road that will assist in further allowing the minimum ventilation standards to be maintained since the existing ventilation system in the underground workings is inadequate and incapable to sustain its functioning mining of coal that will continue to contribute to the Socio Economy in the area.</p>
<p>2.15.2 <i>whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),</i></p>	
<p>2.15.3 <i>the distance from where labourers will have to travel,</i></p>	
<p>2.15.4 <i>the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and</i></p>	
<p>2.15.5 <i>the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).</i></p>	
<p>2.16 What measures were taken to ensure:</p>	
<p>2.16.1 <i>that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and</i></p>	<p>Refer to the Public Participation details attached hereto as Annexure D. Other government departments are included on the list of I&APs and stakeholders and received the notifications of the proposed activity as well as notifications on the availability of the report for review. All applicable environmental legislation was considered during the scoping process.</p>
<p>2.16.2 <i>that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?</i></p>	
<p>2.17 What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will</p>	<p>During the initial Public Participation Process, all issues and concerns raised by the I&APs, stakeholders and the Organs of State are considered, and responses provided.</p>

³¹ Section 2(4)(j) of NEMA refers



Requirement	Part where requirement is addressed/response
be protected as the people's common heritage? ³²	
2.18 Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left? ³³	Mitigation measures for each of the identified impacts are described in detail in the Environmental Management Programme report ("EMPr"). The proposed mitigation measures are realistic to protect both the bio-physical and socio-economic environment in both the short- and long-term.
2.19 What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment? ³⁴	The applicant will be responsible for the costs of any remediation of pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects
2.20 Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations? ³⁵	The alternatives for the proposed project are discussed in Part 7.1.
2.21 Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area? ³⁶	The positive cumulative impact on the socio-economy by the continuation of mining, continuation of employment and employment of local contractors is in line with the planned development of the area.

³² Section 2(4)(o) of NEMA refers.

³³ Section 240(1)(b)(iii) of NEMA and the National Development Plan refer.

³⁴ Section 2(4)(p) of NEMA refers.

³⁵ Section 2(4)(b) of NEMA refers.

³⁶ Regulations 22(2)(i)(i), 28(1)(g) and 31(2)(1) in Government Notice No. R. 543 refer.



7 Motivation for the overall preferred site, activities and technology alternative including a full description of the process followed to reach the proposed preferred alternatives within the site

7.1 Details of the development footprint alternatives considered

As per the Department of Environmental Affairs and Tourism Guideline on Criteria for determining Alternatives in EIA: “Key criteria for consideration when identifying alternatives are that they should be “practicable”, “feasible”, “relevant”, “reasonable” and “viable”. A range of alternatives exists, not all of which are necessarily appropriate for each project under consideration. The different categories of alternatives that can be identified include: (1) activity alternatives; (2) location alternatives; (3) process alternatives; (4) demand alternatives; (5) scheduling alternatives; (6) input alternatives; (7) routing alternatives; (8) site layout alternatives; (9) scale alternatives; and (10) design alternatives. The range of categories of alternatives to be evaluated should be considered along with the “no-go” alternative. Specialist input was obtained in order to identify alternatives associated with the proposed project. The following categories of alternatives have been identified by the specialist in accordance to the key criteria indicated above:

- Location alternatives, and
- No-go alternative.

7.1.1 Location Alternatives

Preferred Location:

The proposed construction of an access road leading to the new ventilation shaft will occur within Portion 6 of the farm Meyersvallei 354 IS. The proposed access road is located within 32 m from the watercourse (refer to Figure 2). The proposed access road will be constructed 70 m away from the graves located close to the proposed site. The proposed access road is located within the artificial wetland formed by a farmer’s dam and will cross the wetland (bridge or culverts to be constructed). The site for the proposed access road is located within the Mining Right area (“MRA”) but the surface rights belong to a farmer.

The following alternative has been identified for the proposed access road by the wetland specialist.

Alternative location:

The alternative of the proposed access road is the site located to the west of the Usutu Canal. The site is located further away from delineated wetland habitat, also it is currently cultivated and supports no natural vegetation. Access to the site will not require any wetland crossings (refer to Figure 2). The overall length of road is longer (1 600m compared to 700 m); this alternative alignment will have little if any impact on the wetland.



The main reasons for not selecting the alternative location it are:

- The use of the road parallel to Usutu canal will affect the integrity of the can wall because of the weight of the machines during construction.
- The servitude doesn't allow heavy mine vehicles to use the alternative road
- Safety is also a concern.

It has been indicated that the preferred alternative is the site located to the south of the unchannelled valley bottom wetland that will require a road crossing over the unchannelled valley bottom wetland (refer to Figure 2).

7.1.2 No-go option for the proposed activities:

The no-go option would be the status quo. The existing ventilation system in the underground workings of the mine is inadequate and incapable of allowing the minimum ventilation standards to be maintained, thus the proposed construction of the access road will play a pivotal role in the construction and operation of the new ventilation shaft. The no-go option requires no investment; however, the mine will not be able to sustain safe working conditions for their employees who work underground if the minimum ventilation standards are not achieved and sustained.

7.2 Details of the Public Participation Process Followed

The public participation process for this project was conducted in terms of:

- The procedures and provisions in terms of the NEMA;
- Chapter 6 of the 2014 EIA Regulations;
- GN 807 of 2012; Public Participation Guideline; and
- Other relevant legislation such as the Promotion of Access to Information Act ("PAIA"), 2000.

A detailed public participation process was undertaken, and included the following:

- Key Stakeholder identification;
- Method of notifications, e.g. advertisements, site notices, Background Information Document ("BID"), email notifications;
- Registration of Interested and Affected Parties ("I&APs") and key stakeholders;
- Access and opportunity to comment on the draft BAR by I&APs; and
- Consultation with the relevant authorities.

The following key stakeholder were identified and notified of the proposed project:

- Landowner/s;
- Lawful occupier/s of the land;
- Landowners or lawful occupiers on adjacent properties;
- Municipal councillor;
- Municipality;
- Organs of state;



- Communities; and
- Other Competent Authorities affected.

The following notification and consultation methods were used:

- Newspaper advertisement in the Standerton News was placed on the 16th of June 2020.
- Site notices were placed around the proposed project site at different, noticeable and conspicuous places on the 17th of June 2020;
- Background Information Document (“BID”) sent to key stakeholders with email notifications; and
- The potential key stakeholders were notified of the proposed project and have been provided with the opportunity to register as an I&AP.

The draft BAR and EMP_r was made available to the public for review for a period of thirty (30) days, from 18 June 2020 to 17 July 2020. An electronic copy of the BAR and EMP_r was also be posted on the Shangoni’s website (www.shangoni.co.za) for public comment for the same period of thirty days.

The public review of the draft BAR has been completed, this report is the final, inclusive of the comments from I&APs and will be submitted to the DMRE for review. Once DMRE has made a decision, registered stakeholders will be notified of the decision.



7.3 Summary of issues raised by I&APs

The table below provide a summary of the comments and issues raised and reaction to those responses

Table 5: Comments and response table.

INTERESTED AND AFFECTED PARTIES	DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
Nokukhanya Khumalo (South African Heritage Resources Agency)	14 July 2020	<p>The SAHRA Archaeology, Palaeontology, Meteorite (APM) unit notes the Heritage Impact Assessment report and the recommendations provided therein. It is however noted that the proposed development area is of very high palaeontological significance. Therefore, a field based Palaeontological Impact Assessment and protocol for finds is also required.</p> <p>The study must comply with section 38(3) of the NHRA and the SAHRA 2006 Minimum Standards: Archaeological and Palaeontological Component of Impact Assessments, and the SAHRA 2012 Minimum Standards: Palaeontological Component of Impact Assessment Report and section 38(3) of the NHRA. The Minimum Standards provides allowance for a Letter of Recommendation for Exemption that can be submitted by a qualified</p>	<p>Thank you for your comments on the draft Basic Assessment Report.</p> <p>Herewith a response to your concerns/comments (dated 14 July 2020).</p> <p>As requested, a Field based Palaeontological Impact Assessment was undertaken by Dr. Fourie. Report is attached on the final Basic Assessment Report ("BAR"), Annexure E3, titled <i>"Proposed Construction of the Ventilation Shaft Access Road Seriti Coal (Pty) Ltd.: New Denmark Colliery, Palaeontological Impact Assessment: Phase 1: Field Study"</i> dated August 2020.</p> <p>The impacts and risks on Palaeontology associated with the proposed development were assessed as part of the risk assessment in Section 7.5 of Part A, also the recommendations were provided by the Paleontological specialist and are</p>	Chapter K and section 7.5 of Part A, and section 1.4.4 of part B.



INTERESTED AND AFFECTED PARTIES	DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
		palaeontologist should they deem it appropriate.	incorporated in the final BAR. The Palaeontological Impact Assessment and the final BAR will also be loaded on SAHRA's website by the end of next week (04/09/2020).	
Kobus Schabort (Shabort Potgieter Attorneys Incorporated)	22 July 2020	<p><u>Re: NOTICE OF THE APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED CONSTRUCTION OF THE VENTILATION SHAFT ACCESS ROAD.</u></p> <p>1. We refer to the abovementioned matter as well as your letter dated the 18th of June 2020. We have noted the contents thereof.</p> <p>2. As previously advised the proposed site for the erection of the said ventilation shaft, is situated on a burial site.</p> <p>3. The burial site is right on the boundary fence of African Spirit Trading's farm.</p> <p>4. We furthermore again request you to properly assess the area for the sustainability of the erection of the ventilation shaft.</p> <p>5. The access road indicated will also intrude on farm lands as well as wet land.</p>	<p><u>Re: NOTICE OF THE APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED CONSTRUCTION OF THE VENTILATION SHAFT ACCESS ROAD</u></p> <p>Thank you for your comments on the draft Basic Assessment Report.</p> <p>Herewith a response to your concerns/comments (dated 22 July 2020).</p> <p><i>1. We refer to the abovementioned matter as well as your letter dated the 18th of June 2020. We have noted the contents thereof.</i></p> <p>Noted</p> <p><i>2. As previously advised the proposed site for the erection of the said ventilation shaft, is situated on a burial site</i></p> <p>Although this application for Environmental Authorisation pertains to the access road only, a Heritage Impact Assessment Report was compiled for the proposed ventilation shaft and associated</p>	Chapter K and L, section 7.5 of part A, and section 1.4.4 of part B.



INTERESTED AND AFFECTED PARTIES	DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
		<p>6. It is clear from the above that the site is not suitable for the erection of the ventilation shaft and should another piece of land be identified, which will be least inclusive to, the property owner and the rights of the families, related to the said burial site.</p> <p>7. In this regard we are of the opinion that the site should be removed to another property, as the movement of the site from the boundary fence more inward in the property of African Spirit Trading will be more intrusive than to move the site to another property.</p> <p>8. We trust that you find the above in order and await to hear from you in this regard.</p>	<p>infrastructure (inclusive of the access road). The Heritage Impact Assessment titled: <i>A report on an Archaeological and Built Environment Heritage Impact Assessment for a proposed ventilation shaft at the New Denmark Colliery, Mpumalanga Province</i> was compiled by Archætnos Culture and Cultural Resources Consultants in February 2020 and attached as Annexure F2 to the draft Basic Assessment Report. From this heritage study it is found that the “<i>A proposed fencing of the cemetery is indicated in the development plan and accordingly Option 1 is recommended. The development is planned 70 m from the graves, which is regarded as an acceptable distance</i>”. The mine proposes to proceed with option 1 and therefore the proposed site will not be located on a burial site.</p> <p>Also, a Field based Paleontological Impact Assessment was conducted by Dr. H, Fourie, report titled <i>Proposed Construction of the Ventilation Shaft Access Road Seriti Coal (Pty) Ltd.: New Denmark Colliery, Palaeontological Impact Assessment: Phase 1: Field Study</i>, dated August 2020. From the Palaeontological study the</p>	



INTERESTED AND AFFECTED PARTIES	DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
			<p>following was provided as Recommendations:</p> <ul style="list-style-type: none"> • There is no objection to the development, it was necessary to request a Phase 1 Palaeontological Impact Assessment: Field Study to determine whether the development will affect fossiliferous outcrops as the palaeontological sensitivity of the Vryheid Formation is VERY HIGH. A Phase 2 Palaeontological Mitigation is only required if fossils are found during construction of the road. Protocol is attached (Appendix 2). • This project may benefit the economy, the life expectancy of the community, the growth of the community and social development in general. • Preferred choice: Preferred Alternative. Both Alternatives have the same impact. • The following should be conserved: if any palaeontological material is exposed during clearing, digging, excavating, drilling or blasting SAHRA 	



INTERESTED AND AFFECTED PARTIES	DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
			<p>must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures.</p> <p><i>3. The burial site is right on the boundary fence of African Spirit Trading’s farm.</i></p> <p>The location of the cemetery is located on the boundary fence, however this will not be affected by the proposed ventilation shaft and associated infrastructure.</p> <p><i>4. We furthermore again request you to properly assess the area for the sustainability of the erection of the ventilation shaft.</i></p> <p>The Basic Assessment Report included the activities associated with the proposed access road leading towards the new ventilation shaft. The activities associated with the proposed ventilation shaft is to form part of a separate Environmental Authorisation process, an amendment to the Environmental Management Programme Report (“EMPr”). This report will be made available for public review. Alternative locations for the ventilation shaft will be assessed as part of the</p>	



INTERESTED AND AFFECTED PARTIES	DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
			<p>amendment to the EMPr. The location of the ventilation shaft is however dependent on amongst other the location of the underground workings. Shangoni is in the process of completing the draft EMPr and we will ensure that this report is provided to you for review.</p> <p><i>5. The access road indicated will also intrude on farm lands as well as wet land.</i></p> <ul style="list-style-type: none"> The site for the proposed access road is located within the New Denmark Colliery Mining Right area (“MRA”) but the surface rights belong to a farmer. A servitude agreement will be done in consultation with the farmer. A wetland study was done by WCS Scientific (Pty) Ltd in a report titled: Wetland delineation and water use risk assessment for a proposed vent shaft at Seriti New Denmark Colliery, and dated January 2020. The impacts and risks associated with Wetland were assessed as part of the detailed risk assessment in Section 7.5 of Part A of the Draft BAR in which the duration, probability, magnitude and reversibility 	



INTERESTED AND AFFECTED PARTIES	DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
			<p>of the impacts were determined and the significance of the impact was calculated. The Draft BAR further provided for an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures. The wetland specialist presented the following recommendations:</p> <ul style="list-style-type: none"> ○ Construction must be undertaken during the dry season at a time where no flow occurs within the affected reach of the wetland; ○ No impoundment of flow should occur upslope of the road crossing; ○ The bridge design must make allowance for flow connectivity to be maintained across the full width of the wetland, i.e. across the full 130 m wide wetland front. This will need to be achieved via a series of culverts along the 	



INTERESTED AND AFFECTED PARTIES	DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
			<p>length of the crossing, ideally box culverts;</p> <ul style="list-style-type: none"> ○ Culvert invert must be the same as the natural ground level to prevent scouring at the outlet or head-cutting from the inlet; ○ Bridge design and construction method statement accommodating these requirements must be submitted to the DWS as part of the General Authorisation application; and The wetland report and recommendations for mitigation contained in this report must form part of the construction method statement. <p>The recommendations from the wetland specialist report have been included in Section 1.4.4 of Part B of the Draft BAR.</p> <p><i>6. It is clear from the above that the site is not suitable for the erection of the</i></p>	



INTERESTED AND AFFECTED PARTIES	DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
			<p><i>ventilation shaft and should another piece of land be identified, which will be least inclusive to, the property owner and the rights of the families, related to the said burial site.</i></p> <p>Refer to the response at number 4.</p> <p><i>7. In this regard we are of the opinion that the site should be removed to another property, as the movement of the site from the boundary fence more inward in the property of African Spirit Trading will be more intrusive than to move the site to another property.</i></p> <p>Your opinion is noted. As mentioned above the alternative sites for the ventilation shaft will be assessed as part of the EMPr amendment. The location of the ventilation shaft is dependant on amongst other the location of the underground workings.</p> <p><i>8. We trust that you find the above in order and await to hear from you in this regard.</i></p> <p>We thank you for your comments and trust that we have addressed your concerns in our response.</p>	



7.4 The Environmental attributes associated with the baseline environment

7.4.1 Type of environment affected by the proposed activity

A baseline description or “status quo” of the present environmental situation is provided in this part of the document. The following attributes / aspects have been described in detail, in the following respective chapters:

- Chapter A: Geology
- Chapter B: Climate
- Chapter C: Topography
- Chapter D: Soil, land use and land capability
- Chapter E: Vegetation
- Chapter F: Fauna
- Chapter G: Surface water
- Chapter H: Groundwater
- Chapter I: Air Quality
- Chapter J: Noise
- Chapter K: Archaeology and Cultural History
- Chapter L: Sensitive Landscapes
- Chapter M: Visual Aspects
- Chapter N: Regional socio-economic structures

This section provides both a summary of the baseline environment as applicable to the proposed access road activities, informed by:

- Anglo Operations Limited. 2005. *Environmental Impact Assessment and Environmental Management Programme submitted as contemplated in Section 39 (1) and Regulation 50 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) as part of a mining right application under Section 22(1) of the Act, Mining Right Application New Denmark Colliery DMRE Reference No. MP 30/5/1/2/2/ (74) MR.*
- Dr. Fourie. August 2020. *Proposed Construction of the Ventilation Shaft Access Road Seriti Coal (Pty) Ltd.: New Denmark Colliery, Palaeontological Impact Assessment: Phase 1: Field Study, dated August 2020.*
- Golder Associates. 2015. *Biodiversity Action Plan for New Denmark Colliery's Mining Rights Area, 2015 – 2020*
- Aquatico Scientific. January 2019 to March 2019. *New Denmark Colliery Quarterly Water Quality Assessment Report.*
- WC Scientific (Pty) Ltd. 31 January 2020. *Wetland delineation and water use risk assessment for proposed vent shaft at Seriti New Denmark Colliery.*



Chapter A: Geology

The information contained in this section is obtained from the *Environmental Impact Assessment and Environmental Management Programme submitted as contemplated in Section 39 (1) and Regulation 50 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) as part of a mining right application under Section 22(1) of the Act, Mining Right Application New Denmark Colliery DMRE Reference No. MP 30/5/1/2/2/ (74) MR*, dated 2005.

The NDC reserves occur within the Vryheid Formation of the Ecca Group within the Karoo Sequence. Sixty boreholes have been drilled by the mine to the base of the Karoo Supergroup in the lease area from which geological information could be derived. The thickness of the sediments underlying the No. 4 coal seam varies between 50 and 300 m. The coal-bearing Ecca Group ranges in thickness from 125 - 360 m and is comprised of an upper shale-like stage, the Volksrust Shale Formation, the mainly sandy coal measure stage, the Vryheid Formation, and a locally developed lower silt to shale stage, the Pietermaritzburg Shale Formation. The Vryheid Formation sediments developed in the NDC area are similar to those occurring elsewhere in the Highveld and Witbank Coalfields and are comprised mainly of sandstone, with lesser amounts of sandstone / siltstone and mudstone. The proposed access road is located on the Karoo Dolerite Mesozoic Era Lithology class dolerite, and the ventilation shaft is located on the Volksrust grip Palaeozoic era Lithology class shale (refer to Figure 3).

Chapter B: Climate

The information contained in this section is obtained from the *Environmental Impact Assessment and Environmental Management Programme submitted as contemplated in Section 39 (1) and Regulation 50 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) as part of a mining right application under Section 22(1) of the Act, Mining Right Application New Denmark Colliery DMRE Reference No. MP 30/5/1/2/2/ (74) MR*, dated 2005.

The NDC mine boundary area is situated within the Mpumalanga Highveld region. The climate is temperate with warm to hot summers and the winter months are cold with moderate to severe frost. The main climatic hazards are thunderstorms and hail in summer, and severe frost which may occur during a period of 150 days between April and September. The mean annual rainfall is approximately 695 mm, of which most occurs in the summer months.

Table 6 summarises the mean monthly rainfall data for the weather station at Standerton (No. 0441416A0) with latitude 26°56' and longitude 29°14' for a time period of 29 years from 1961 - 1990. It also indicates the 24-hour maximum rainfall with the year in which it occurred, as well as the number of days with a precipitation greater than 0.1 mm. The mean annual rainfall recorded for the mining area is 695 mm.

The average daily maximum temperature is approximately 31.5 C in January and 22.4 °C in July. In extreme cases, daily maximum temperatures may rise to 35.6 °C and 25.3 °C in January and July respectively. Average daily minimal temperatures range from roughly 9.4 C in January to - 6.7 C in July. Extreme minimal daily temperatures can drop to 4.5 °C in January and - 9.2 °C in July. The mean



monthly maximum and minimum temperatures as measured for a period of 29 years from 1961 - 1990 are presented in Table 8.

Table 6: Mean monthly rainfall data

Month	Mean monthly rainfall	24 hour maximum		Number of days
		Rainfall	Year	
January	122	106	1980	14.5
February	87	95	1970	10.4
March	66	81	1964	9.5
April	44	64	1990	6.6
May	12	45	1976	3.1
June	9	26	1989	1.9
July	7	21	1970	1.3
August	12	38	1979	1.8
September	29	45	1987	4.5
October	86	70	1969	9.8
November	117	103	1963	14.0
December	104	66	1977	12.9
Year	695	106	1980	90.3

Table 7: Maximum rainfall intensities

Storm duration (hr)	Return period (years)						
	2	5	10	20	50	100	200
0.25	72	95	117	144	190	234	288
0.5	50	66	81	100	132	162	199
1	32	42	51	63	83	102	126
2	19	25	30	37	49	60	74



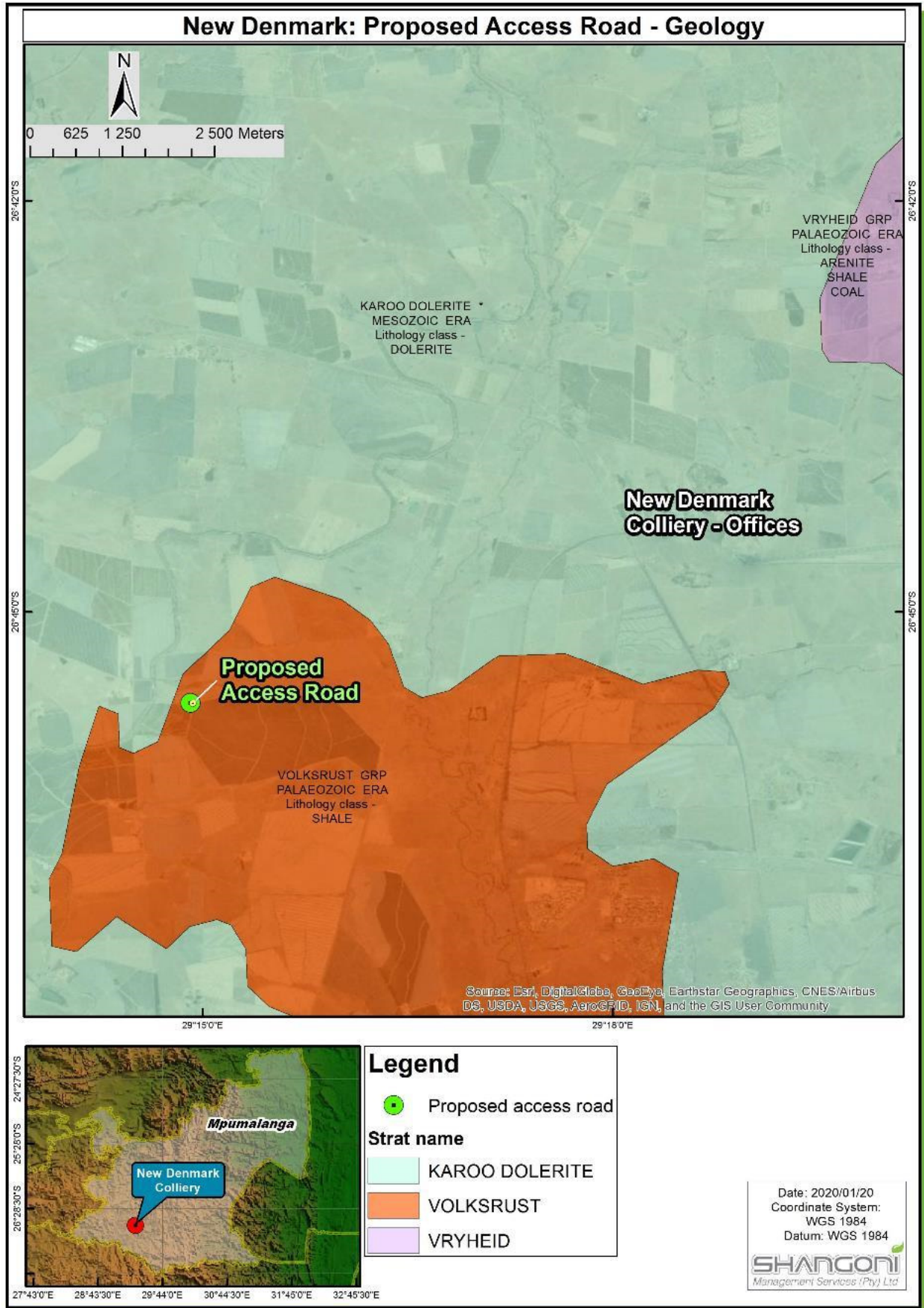


Figure 3: Regional Geology of the area associated with the proposed access road



Table 8: Mean monthly temperatures

Month	Temperatures		
	Maximum	Minimum	Mean
January	26.8	13.8	20.3
February	26.2	13.2	19.7
March	25.5	11.6	18.6
April	22.3	7.4	14.9
May	20.2	2.4	11.3
June	17.2	- 1.7	7.8
July	17.8	- 1.8	8.0
August	20.7	1.2	11.0
September	24.3	5.9	15.1
October	24.9	9.2	17.1
November	25.1	11.5	18.3
December	26.5	13.0	19.8

Wind direction and speed information from the Standerton weather station using wind data collected over a period of 9 years from 1993 - 2002 were utilised. From January, through to April the wind blows from the east to the west. In May and June, the predominant wind direction is from west to east. From July to September, there is no specific predominant wind direction and the wind blows equally from both east and west. In October and November, the predominant wind direction is from east to west. In December, the predominant wind direction is from east to west. The yearly average indicates that the predominant wind direction in order of magnitude is from the east followed by east-north-east and then the west. The mean monthly evaporation (in mm) for the period 1960 to 1987 measured at Standerton is given in Table 9.

Table 9: Mean monthly evaporation

Variable	Mean monthly evaporation
January	191.8
February	159.2
March	159.0
April	113.8
May	98.5
June	79.1
July	94.3



Variable	Mean monthly evaporation
August	127.1
September	177.8
October	196.0
November	180.4
December	200.2
Year	1777.2

Chapter C: Topography

The information contained in this section is obtained from the *Environmental Impact Assessment and Environmental Management Programme submitted as contemplated in Section 39 (1) and Regulation 50 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) as part of a mining right application under Section 22(1) of the Act, Mining Right Application New Denmark Colliery DMRE Reference No. MP 30/5/1/2/2/ (74) MR*, dated 2005.

The natural topography and drainage patterns of the area can be described as generally flat with occasional gentle slopes. Settlement of the surface subsidence in areas of flat topography generally results in a temporary reduction in run-off and the creation of temporary ponds on the surface. Alterations to drainage paths have been noted as a result of surface subsidence, but this can be rectified through limited earthworks and other remedial measures. The mine falls within the land type inventory map for 2628 East Rand. The specific land type that the site falls in is Ea17, which stipulates a terrain code for the area as being A2 which is described as:

- A: More than 80 % of the area has a slope of less than 8 %, and
- 2: The relief between the highest and the lowest points in the landscape averages between 30 to 90 m.

Chapter D: Soil, land use and land capability

The following information was obtained from the *Environmental Impact Assessment and Environmental Management Programme submitted as contemplated in Section 39 (1) and Regulation 50 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) as part of a mining right application under Section 22(1) of the Act, Mining Right Application New Denmark Colliery DMRE Reference No. MP 30/5/1/2/2/ (74) MR*, dated 2005.

Soils

The proposed access road is associated with S5 swelling clay soils that are high in natural fertility and high swell-shrink potential which are very plastic and are sticky (refer to Figure 4).

Land cover

The proposed access road will be situated on cultivated fields (refer to Figure 5).



Land use and capability

The land capable of sustaining arable crop production is suited to intensive sustained dryland and irrigation cropping, provided that the quality of the water is within acceptable sodicity and salinity limits. These soils require skilled management and skilled irrigation design and there are some restrictions on the choice of crops that can be grown successfully.

The areas that classify as grazing land are generally confined to the shallower and transitional zone. The land is subject to such extreme limitations with regard to the effective rooting depth of less than 300 mm or poor drainage that remedial measures are not considered economically practically practical for typical cropping systems. This category is best left undisturbed as veld grazing. There are no rocks or pedocrete fragments in the upper horizons of any of the soil groups, which will limit the land capability to wilderness land.

The wetland areas are defined in terms of the wetland delineation guidelines, which use soil form, topography as well as botanic criteria to define the limits to this domain. The soils in this class of land are predominantly wet bottom land soils of the Rensburg series. This class of land is typically permanently wet and is best left undisturbed under the natural grass cover.

Table 10: Land capability of total surveyed portions

Land capability	Area (ha)	Total area (%)
Arable	4941.34	78.49
Grazing	1 004.51	15.95
Wetland	290.375	4.61
Wilderness	59.26	0.94
Total	6 295.485	100

The areas that classify as wilderness land are found associated with the shallow, rocky soils. This class of land falls within the damp to wet transition zones. Table 11 indicates the completed studies applicable to the proposed access road will be located on Portion 6 of the farm Meyersvallei 354 IS.

Table 11: Land capability studies performed within the NDC MRA applicable to the proposed access road.

Farm name	Farm no.	Portion	Extent (ha)	Land capability studies
Meyersvallei	354	6	85.7	> 2014



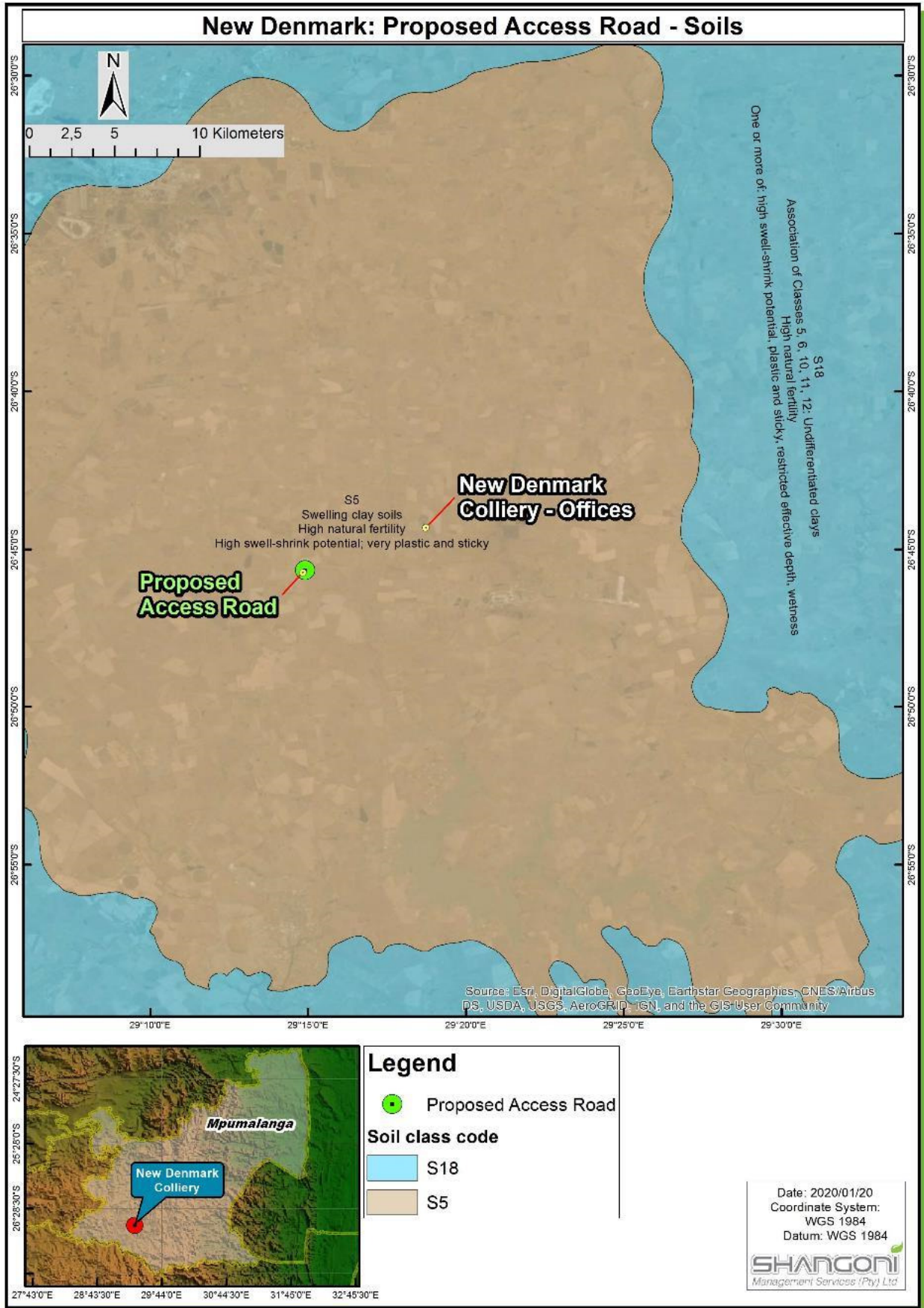


Figure 4: Soils associated with the proposed access road.



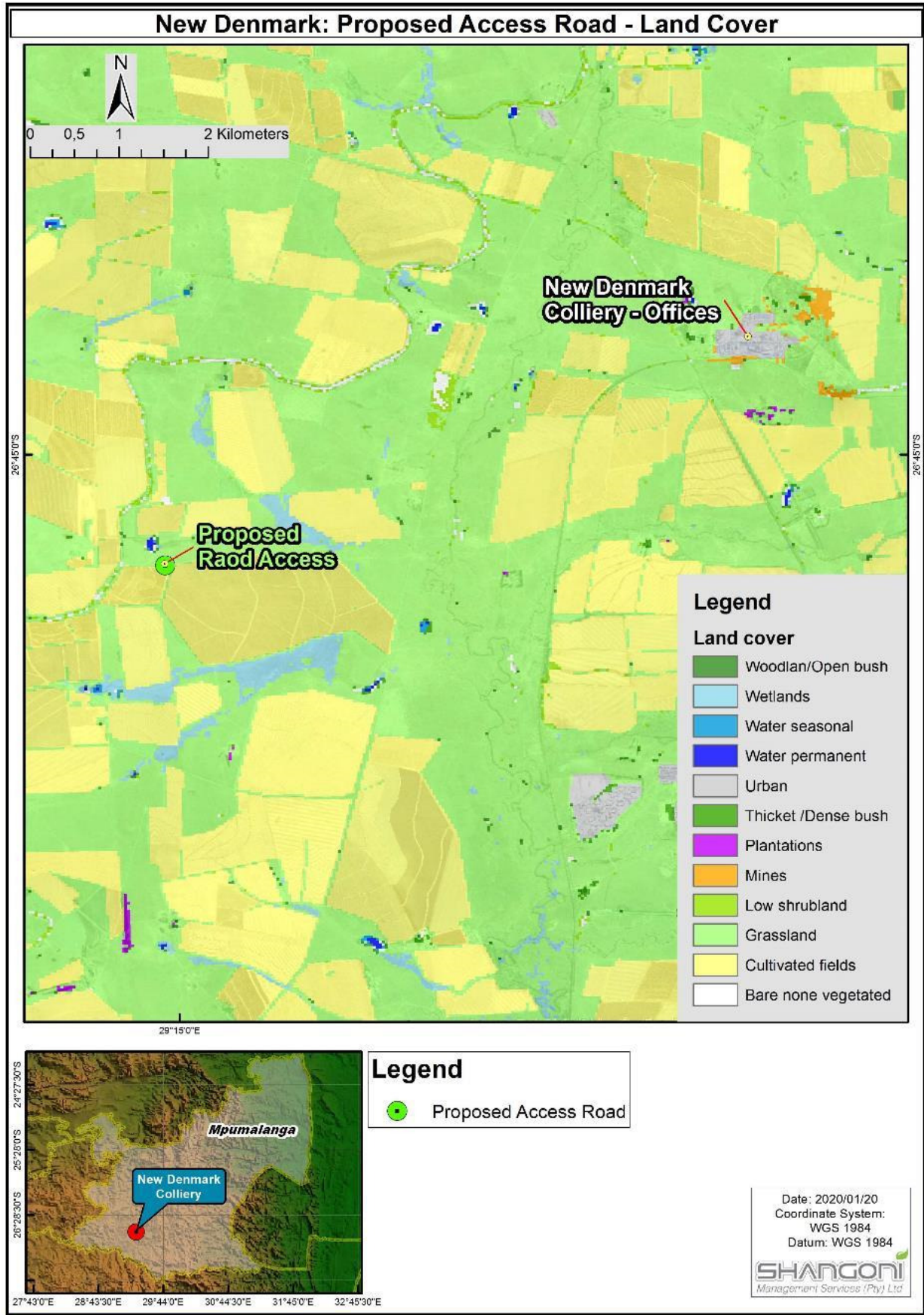


Figure 5: Land cover associated with the proposed access road.



Chapter E: Vegetation

The following information was obtained from the *Environmental Impact Assessment and Environmental Management Programme submitted as contemplated in Section 39 (1) and Regulation 50 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) as part of a mining right application under Section 22(1) of the Act, Mining Right Application New Denmark Colliery DMRE Reference No. MP 30/5/1/2/2/ (74) MR*, dated 2005 and the *Biodiversity Action Plan for New Denmark Colliery's Mining Rights Area, 2015 - 2020* dated September 2015.

The mine contains a number of different grass species, indigenous trees and invader species in disturbed areas. The entire MRA falls within a vegetation type known as 'Themeda Veld'.

The Highveld region is divided into four distinct zones, namely the arid west, the Bankenveld, the Central plateau and the Drakensberg. Each zone has a reasonably uniform altitude, rainfall, climate and geology and, therefore, vegetation. The vegetation of the study area falls within the Bankenveld zone. The three main habitats, which can be found in each zone, are:

- Grasslands, which are open and unprotected from fire and frost,
- Rocky areas, which provide increased soil moisture, and more protection from both fire and frost, and
- Rivers and gorges, where there is additional moisture and more protection from fire.

The main habitat that was identified in the MRA of NDC was Grassland. The Grassland Biome of South Africa is considered to have very high levels of biodiversity. Approximately 79 % of the Moist Clay Highveld Grassland (No. 35, Low and Rebelo, 1998) has been transformed. This is mostly through overgrazing by sheep and cattle, and to a lesser degree by ploughing because of the high clay content of the soil.

The proposed access road fall within the Grassland Biome, Mesic Highveld Grassland Bioregion. At a finer level, the area is categorised as Soweto Highveld Grassland (Gm8). (refer to Figure 6). The Soweto Highveld Grassland is listed as Vulnerable in the National List of Ecosystems that are Threatened and in Need of Protection.

Undisturbed Grassland

Undisturbed Grassland exists in fragmented grassland patches throughout the MRA that have not been subjected to ploughing or overgrazing. This vegetation community is characterised by a dominance of *Themeda triandra* and *Hyparrhenia hirta* and high species richness.

Disturbed Grassland

Disturbed Grassland occurs as scattered fragments near drainage lines and where overgrazing is prevalent throughout the MRA. Overgrazing by cattle and sheep appears to be the main source of disturbance within the MRA. The pioneer grass *Eragrostis plana* is the most dominant grass, and is a species that is indicative of over-utilised veld. The Disturbed Grassland community is characterised by low species richness.





Figure 6: Vegetation associated with the proposed access road.



Chapter F: Fauna

The following information was obtained from the *Environmental Impact Assessment and Environmental Management Programme submitted as contemplated in Section 39 (1) and Regulation 50 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) as part of a mining right application under Section 22(1) of the Act, Mining Right Application New Denmark Colliery DMRE Reference No. MP 30/5/1/2/2/ (74) MR, dated 2005 and the Biodiversity Action Plan for New Denmark Colliery's Mining Rights Area, 2015 – 2020, dated September 2015.*

Mammals

A number of mammal species of conservation concern have potential to occur within the MRA, based on their current natural distribution. These and their likelihood of occurrence within the MRA are summarised in Table 12. Aardvark is the only mammal species of conservation concern considered likely to be present, as well as those already recorded to date (Cape Clawless Otter, Serval and Steenbok).

Table 12: Mammal species of conservation concern

Scientific Name	Common Name	IUCN Regional Status	NEMBA ToPS List (2013)	Mpumalanga Protected Species	Likelihood of Occurrence within MRA
<i>Amblysomus robustus</i>	Robust Golden Mole	Endangered	-	-	Unlikely - known from the Steenkampsberg mountains in the Belfast and Dullstroom districts
<i>Atelerix frontalis</i>	Southern African Hedgehog	Near Threatened	-	Protected	Possible – habitat preferences are wide
<i>Aonyx capensis</i>	Cape Clawless Otter	-	Protected	Protected	Recorded
<i>Lutra maculicollis</i>	Spottedneck ed Otter	Near Threatened	-	Protected	Possible – suitable freshwater habitat exists within MRA
<i>Proteles cristatus</i>	Aardwolf	-	-	Protected	Unlikely - distribution is largely determined by the distribution of Trinervitermes termites, which are not recorded from MRA
<i>Felis nigripes</i>	Small spotted Cat	-	Protected	-	Unlikely



Scientific Name	Common Name	IUCN Regional Status	NEMBA ToPS List (2013)	Mpumalanga Protected Species	Likelihood of Occurrence within MRA
<i>Leptailurus serval</i>	Serval	Near Threatened	Protected	-	Recorded
<i>Orycteropus afer</i>	Aardvark	-	Protected	Protected	Likely
<i>Connochaetes gnou</i>	Black Wildebeest	-	Protected	Protected	Unlikely
<i>Raphicerus campestris</i>	Steenbok	-	-	Protected	Recorded
<i>Redunca fulvorufula</i>	Mountain Reedbuck	-	-	Protected	Unlikely
<i>Pelea capreolus</i>	Grey Rhebok	-	Protected	Protected	Unlikely – prefers mountainous terrain

Species recorded within the MRA

Mammal species that have been recorded over the course of biodiversity surveys conducted within New Denmark Colliery's MRA are summarised in Table 13. The presence of species of conservation concern is indicated, and their presence as stock in the game camps is also specified where relevant.

Table 13: Mammal species recorded within MRA

Scientific Name	Common Name	Species of conservation concern	Game Camp Species
<i>Aonyx capensis</i>	Cape Clawless Otter	√	
<i>Atilax paludinosus</i>	Water Mongoose		
<i>Canis mesomelas</i>	Black-backed Jackal		
<i>Cynictis penicillata</i>	Yellow Mongoose		
<i>Suricata suricatta</i>	Suricate		
<i>Galerella sanguinea</i>	Slender Mongoose		
<i>Ichneumia albicauda</i>	White-tailed Mongoose		
<i>Ionyx striatus</i>	Striped Polecat		
<i>Leptailurus serval</i>	Serval	√	
<i>Lepus saxatilis</i>	Scrub Hare		
<i>Mastomys coucha/natalensis</i>	Multimammate Mouse		



Scientific Name	Common Name	Species of conservation concern	Game Camp Species
<i>Rhabdomys pumilio</i>	Four-striped Mouse	Grass	
<i>Xerus inauris</i>	Ground Squirrel		
<i>Antidorcas marsupialis</i>	Springbok		
<i>Oryz gazelle</i>	Gemsbok		√
<i>Alcelaphus buselaphus</i>	Red Hartebeest		√
<i>Equus quagga</i>	Zebra		√
<i>Kobus ellipsiprymnus</i>	Waterbuck		√
<i>Damaliscus puygargus</i>	Blesbok	√	√
<i>Raphicerus campestris</i>	Steenbok	√	√
<i>Sylvicapra grimmia</i>	Common Duiker		
<i>Tragelaphus oryx</i>	Eland	√	√

Although Gemsbok, Red Hartebeest, Zebra, Waterbuck, Blesbok and Eland are species of conservation concern, it is important to note that their presence within the MRA is due to their stocking in the game camps; the MRA and the wider area no longer lies within the current distribution of these species.

Birds

According to the South African Bird Atlas Project (SABAP) 220 bird's species have been recorded in the region, of which 23 are of conservation importance. Three distinct bird assemblages associated with specific vegetation communities have been recognised within the MRA during bird surveys (refer to Table 14).

Table 14: Vegetation communities and associated dominant species

Vegetation Community	Dominant Species
Undisturbed Grassland	Cape Longclaw (<i>Macronyx capensis</i>), Long-tailed Widowbird (<i>Euplectes progne</i>), Greater Striped Swallow (<i>Cecropis cucullata</i>), African Pipit (<i>Anthus cinnamomeus</i>), Cloud Cisticola (<i>Cisticola textrix</i>), Red-capped Lark (<i>Calandrella cinerea</i>), Amur Falcon (<i>Falco amurensis</i>)
West Valley Grassland	Long-tailed Widowbird (<i>Euplectes progne</i>), Greater Striped Swallow (<i>Cecropis cucullata</i>), Barn Swallow (<i>Hirundo rustica</i>), SA Cliff Swallow (<i>Petrochelidon spilodera</i>), African Quailfinch (<i>African Quail-finch</i>), Blackheaded Heron (<i>Ardea melanocephala</i>), Southern Red Bishop (<i>Euplectes orix</i>)
Endoheric Pan	Insufficient Sampling to determine dominance.



Vegetation Community	Dominant Species
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Source: Nepid Consultants (2010)

Overall 130 bird species have been recorded within the MRA, including 8 species of conservation concern with Undisturbed Grassland being the most important vegetation community for birds of conservation concern (refer to Table 15).

Table 15: Bird species of conservation concern recorded within the MRA

Species Name	Common Name	Conservation Status (IUCN Regional Red List)	Undisturbed grassland	Wet Grassland	Pan	Disturbed Grassland	Recorded notes
<i>Anthropoides paradiseus</i>	Blue Crane	Vulnerable	x	x			Three pairs observed on Vlakspruit 301 IS – breeding within MRA likely.
<i>Hydroprogne caspia</i>	Caspian Tern	Vulnerable				x	Observed at pan on Vogelvallei 355 IS – likely an irregular visitor.
<i>Eupodotis caerulescens</i>	Blue Korhaan	Least Concern	x				Although LC regionally, these are considered NT globally and thus are of conservation concern. Observed in Undisturbed grassland in several locations throughout MRA.
<i>Circus macrourus</i>	Pallid Harrier	Near Threatened	x	x			Observed at wet grassland on Vlakefontein, non-breeding summer visitor.
<i>Falco biarmicus</i>	Lanner Falcon	Vulnerable	x			x	Several flocks were seen feeding over disturbed grassland and ploughed lands at several localities, nonbreeding summer visitor.
<i>Glareola nordmanni</i>	Black-winged Pratincole	Near Threatened	x			x	Several flocks were seen feeding over disturbed grassland and ploughed lands at several localities, nonbreeding summer visitor.
<i>Phoenicopterus roseus</i>	Greater Flamingo	Near Threatened			x		Flocks observed at large pan on Vogelvallei 355 IS, and on smaller pan nearby. Non-breeding winter visitor.
<i>Sagittarius serpentarius</i>	Secretarybird	Vulnerable	x		x	x	Observed within game camp – wide habitat preference.

Based on the information presented in Table 15 above, the MRA is probably of greatest significance for blue crane, given that three separate (probably) breeding pairs have been observed within the wet and



undisturbed grasslands of MRA. Conservation and maintenance of breeding habitat for this species should therefore be a priority biodiversity management objective for NDC.

Herpetofauna

To date, four frog species and one snake species have been recorded within the MRA, none of which are of conservation concern (refer to Table 16). However, not specifically targeted herpetofauna survey of the MRA has been conducted; therefore, a number of additional species could potentially occur e.g. African clawed frog (*Xenopus laevis*). Species of conservation concern that have potential to occur are summarised in the next section (refer to Table 17)

Table 16: Reptiles and amphibians recorded within the MRA

Reptiles	
<i>Hemachatus haemachatus</i>	Rinkhals
Amphibians	
<i>Afrana fuscigula</i>	Cape River Frog
<i>Bufo rangeri</i>	Raucous Toad
<i>Cacosternum boettgerii</i>	Common Caco
<i>Schismaderma carens</i>	Red Toad

Species of Conservation Concern with Potential to occur within the MRA

Based on species distribution and habitat preferences, herpetofauna species of conservation concern that could potentially occur within the MRA are summarised in Table 17 below.

Table 17: Herpetofauna Species of Conservation Concern with potential to occur within MRA

Scientific Name	Common Name	IUCN Regional Status	NEMBA ToPS List (2013)	Mpumalanga Protected Species*	Endemic Status	Undisturbed grassland	Disturbed Grassland	Wetland/pan
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	Near Threatened		Protected				x
<i>Acontias gracilicauda</i>	Thin tailed Legless Skink	-	-	Protected	Endemic	x		
<i>Afroablepharus wahlbergii</i>	Wahlberg's Snake-eyed Skink	-	-	Protected	-	x		



Scientific Name	Common Name	IUCN Regional Status	NEMBA ToPS List (2013)	Mpumalanga Protected Species*	Endemic Status	Undisturbed grassland	Disturbed Grassland	Wetland/pan
<i>Afrotyphlops bibronii</i>	Bibron's Blind Snake	-	-	-	Near endemic	x		x
<i>Agama aculeata distantii</i>	Eastern Ground Agama	-	-	Protected	Endemic	x		
<i>Chamaesaura aenea</i>	Coppery Grass Lizard	Near Threatened	-	Protected	Endemic	x		
<i>Cordylus vittifer</i>	Common Girdled Lizard	-	-	Protected	Endemic	x		
<i>Duberria lutrix lutrix</i>	South African Slug-eater	-	-	-	Endemic	x		
<i>Gerrhosaurus flavigularis</i>	Yellow-throated plated Lizard	-	-	Protected	-	x		
<i>Hemachatus haemachatus</i>	Rinkhals	-	-	-	Near endemic	x	x	x
<i>Lamprophis aurora</i>	Aurora Snake	-	-		Endemic	x		x
<i>Lygodactylus capensis</i>	Common Dwarf Gecko	-	-	Protected	-	x	x	
<i>Lygodactylus ocellatus</i>	Spotted Dwarf Gecko	-	-	Protected	Endemic	x		



Scientific Name	Common Name	IUCN Regional Status	NEMBA ToPS List (2013)	Mpumalanga Protected Species*	Endemic Status	Undisturbed grassland	Disturbed Grassland	Wetland/pan
<i>Pachydactylus affinis</i>	Transvaal gecko	-	Protected	Protected	Endemic	×	×	×
<i>Pachydactylus capensis</i>	Cape Gecko	-	Protected	Protected	-	×	×	
<i>Pachydactylus vansoni</i>	Van Son's Gecko	-	Protected	Protected	Near endemic	×		
<i>Psammophis crucifer</i>	Cross-marked Grass Snake	-	-	-	Near endemic	×		
<i>Pseudocordylus melanotus</i>	Common Crag Lizard	-	-	Protected	Endemic	×		
<i>Trachylepis capensis</i>	Cape Skink	-	-	Protected	-	×	×	
<i>Trachylepis punctatissima</i>	Speckled Rock Skink	-	-	Protected	-	×	×	
<i>Trachylepis varia</i>	Variable Skink	-	-	Protected	-	×		

*All reptiles, excluding monitors (*Varanus* spp.) and snakes (*Serpentes*) are protected according to Schedule 2 of the Mpumalanga Nature Conservation Act

Invertebrates

In general, invertebrate diversity is highest in undisturbed grasslands in the MRA. Table 18 shows the invertebrates and numbers found to occur on the MRA.

Table 18: Invertebrates recorded in the MRA



Taxa	Number of species recorded
Ants	25
Cicadellid Leafhoppers	55
Butterflies	14
Carabid and Tenebrionid Beetles	-
Mygalomorph Spiders	2

Chapter G: Surface water

The following information was obtained from the *Environmental Impact Assessment and Environmental Management Programme submitted as contemplated in Section 39 (1) and Regulation 50 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) as part of a mining right application under Section 22(1) of the Act, Mining Right Application New Denmark Colliery DMRE Reference No. MP 30/5/1/2/2/ (74) MR*, dated 2005 and Aquatico Scientific. January 2019 to March 2019. *New Denmark Colliery Quarterly Water Quality Assessment Report*.

NDC is situated in the Grootdraai Dam sub-catchment of the Upper Vaal River water management area. The receiving water resources are the Leeuspruit and Blesbokspruit that flow into the Grootdraai Dam, as well as the Rietspruit, which joins the Vaal River below the Grootdraai Dam. The relevant quaternary catchment areas to NDC are C11K, C11H and C12E (refer to

Figure 7).

The study area is located in the Vaal River Catchment (Primary Catchment C), and more specifically quaternary catchment C11K. Catchment C11K is drained by the Leeuspruit River and its tributaries. Information regarding catchment size, mean annual rainfall and runoff for the quaternary catchment is provided in the table below.

Table 19: Mean Annual Precipitation, run-off and potential evaporation per quaternary catchment.

Quaternary Catchment	Catchment Surface Area (ha)	Mean Annual Rainfall (MAP) in mm	Mean Annual Run-off (MAR) in mm	MAR as a % of MAP
C11K	30 840	633	59.7	9.4 %

A portion of the Leeuspruit was undermined during 1997. A dolerite outcrop cracked due to the subsidence, which occurred during total extraction mining. It was evident from visual inspections that the water from the Leeuspruit flowed into the mined-out areas. A number of other watercourses and drainage lines have also been undermined (by bord and pillar, as well as total extraction mining methods). Such undermining may result in a gradual settlement of up to 850 mm. This may result in minor temporary ponding of short sections of a spruit and temporary loss of surface water flow.

Water flows to the underground mining operations from different sources:



- Surface ingress due to disturbed natural drainage lines;
- Fractured aquifer formations draining to the workings; and
- Regional groundwater draining towards the large underground voids created by mining.

The ecological status of the river systems within the MRA is classified as moderately modified, with higher significant impacts present within the direct Grootdraai Dam catchment area. This may be as a result of cumulative impacts occurring upstream from various activities. Few aquatic sites of high ecological significance exist within the MRA however the mine is ecologically linked via several watercourses and bordered by important wetlands. Some small wetlands as well as a number of non-perennial and perennial watercourses occur in the MRA.

Surface water quantity

The impacts of the existing undermining activities on surface water containing structures such as canals, dams and streams have been minimal in terms of both quality and quantity. The existing impacts on the watercourses such the Leeuspruit have been proven negligible. Flows have been maintained in the watercourses in spite of the existing underground mining activities and associated surface impacts. Some small farm dams have had a temporary loss of water when undermining was in progress. It was indicated that surface water from the watercourses and dams does seep into underground workings (in addition to normal seepage). Fractures occur above the longwall panels that connect the existing underground workings with the surface and seepage of surface water into the mine is thus possible.

A number of existing rock dumps are located within the mine's dirty water management areas. Before the rock dumps are rehabilitated, the exposed surfaces may lead to an increase in the infiltration of rainwater and therefore a minor decrease in the run-off. Once the exposed surfaces associated with the rock dumps are rehabilitated, including the placement of topsoil and vegetated, this impact becomes negligible. The possible impact from existing surface infrastructure including the storm water management channels includes an increase in run-off and thus a decrease in infiltration. The existing overland conveyors disturbed the pre-mining run-off patterns of surface water but do not have an effect on the catchment yield. Direct rainfall on the plant and stockpile areas reports to a dirty water management system and thus not to the relevant watercourses. Treated domestic wastewater effluent reports to a number of small farm dams.

Settlement due to undermining of the surface in areas of flat topography may result in the creation of temporary ponds on surface and thus a temporary reduction in surface water run-off. However, this can be rectified through the implementation of some earthworks and other remediation measures. Alterations of drainage paths have been noted as a result of surface subsidence at NDC. The affected area is approximately 72 ha in extent and is a minimal portion (0.18 %) of the total catchment area of ± 40 000 ha.

Mean Annual run-off (MAR)

The MAR values were calculated using the Pitman model (WRSM-90) simulated for a 79-year rainfall period from 1912 – 1991 (refer to Table 20).



Table 20: Mean annual run-off (MAR) for the relevant catchment areas.

Catchment	MAR (Mm ³ / annum)	Base flow (m ³)
Leeuspruit	14.47	0 – 0.18
Rietspruit	6.10	0 – 0.03
Blesbokspruit (Vlakspruit)	3.51	0 – 0.02
Blesbokspruit (Mooifontein)	1.65	0 – 0.01

Normal dry weather flow

Flood peak volumes computed by AAC Civil Engineering Department for 1 in 50 and 1 in 100 year 24-hour event for the main catchment area are 1.94 million m³ per day and 2.09 million m³ per day, respectively. Flood peaks for the minor catchment areas have not been computed. A minor diversion of a non-perennial channel to the Leeuspruit takes clean water around the pollution control dam.

Surface Water Use

The principal users of the water in the Leeuspruit and Leeuspruit tributaries are the local farming communities. The surface water resources are mainly utilised as drinking water for cattle and sheep. The Eskom Tutuka Power Station provides water to NDC as well as the farmers whose boreholes are affected by mining activities.

Surface water features

The closest surface water features to the proposed access road is the Leeuspruit (refer to Figure 8).



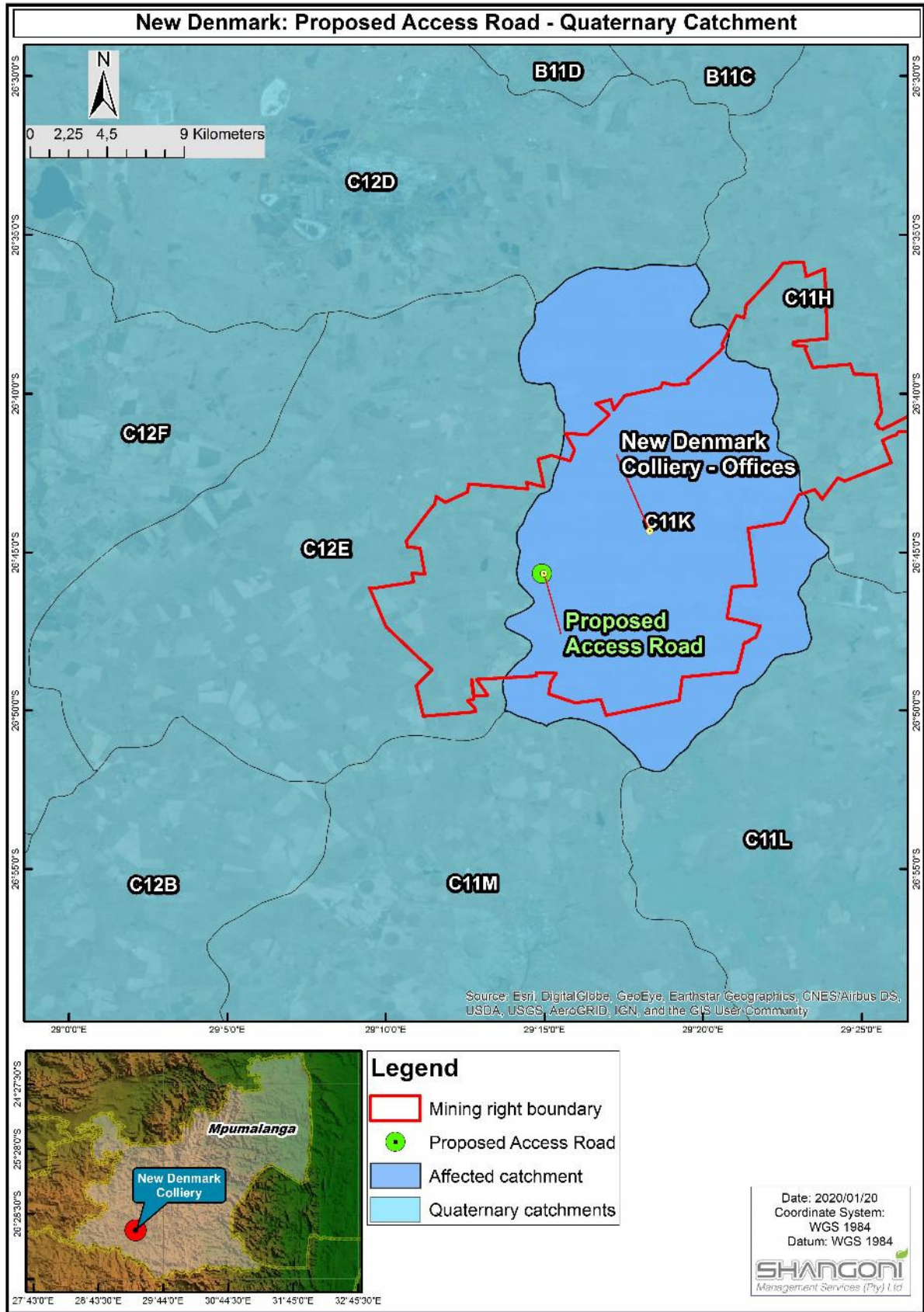


Figure 7: Quaternary catchment associated with the proposed access road



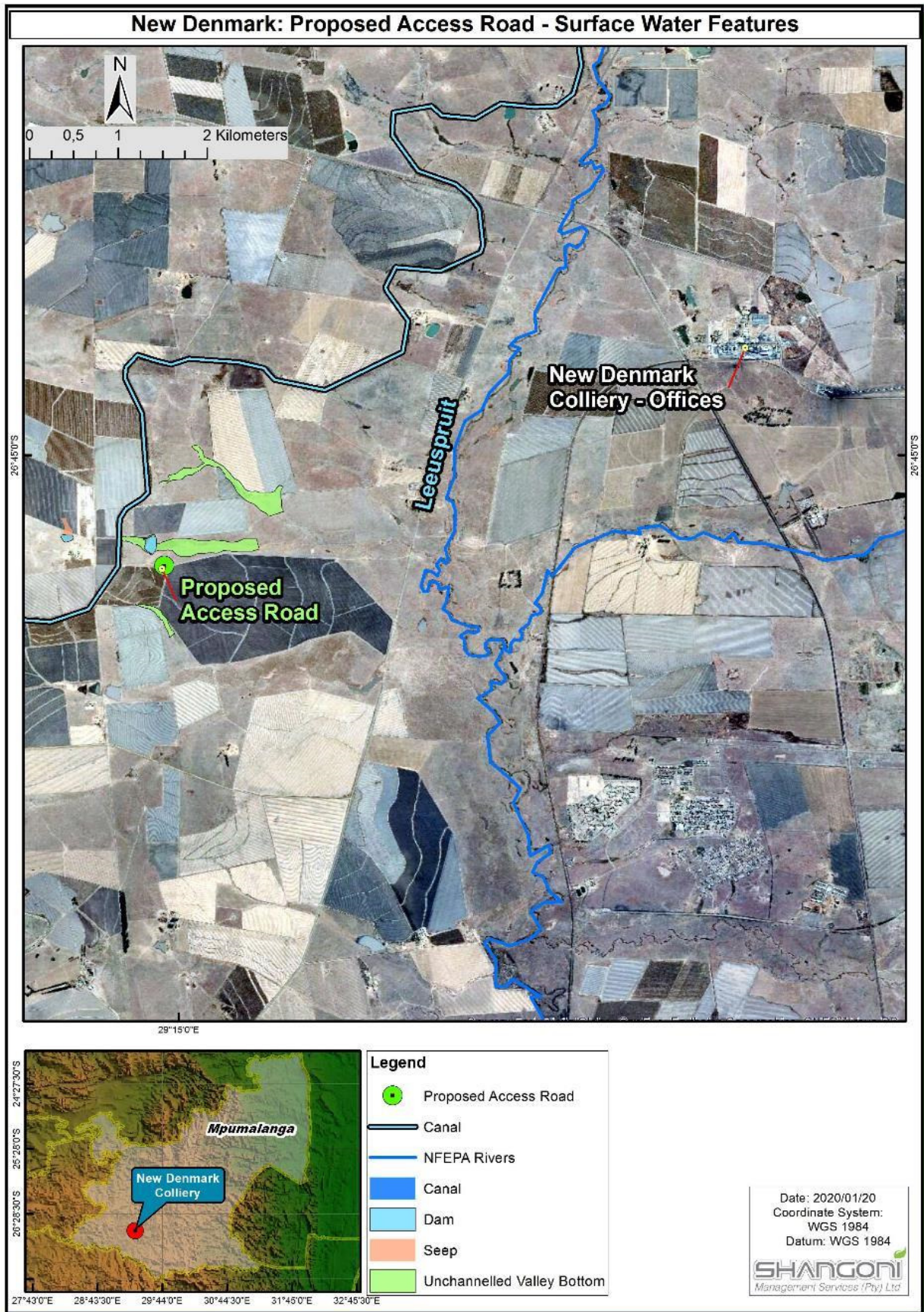


Figure 8: Surface water features associated with the proposed access road.



Chapter H: Groundwater

The following information was obtained from the *Environmental Impact Assessment and Environmental Management Programme submitted as contemplated in Section 39 (1) and Regulation 50 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) as part of a mining right application under Section 22(1) of the Act, Mining Right Application New Denmark Colliery DMRE Reference No. MP 30/5/1/2/2/ (74) MR*, dated 2005 and Aquatico Scientific. January 2019 to March 2019. *New Denmark Colliery Quarterly Water Quality Assessment Report*.

Two groundwater aquifers were identified in the area. The upper aquifer lies within the weathered zone, which extends up to 15 m below the surface. This is normally the aquifer accessed for agricultural use. The shallow depth of this aquifer is partly attributed to the presence of a 60 m thick dolerite sill over large portions of the area. The second aquifer is usually associated with fractures within the arenaceous sediments such as sandstone and grit. Groundwater may be intersected at any level within these sediments, down to the No. 4 coal seam horizon at ± 180 m.

The existing mining operations have a significant impact on groundwater in the study area. The removal of the coal contributes to the fracturing of the overlying strata, allowing the groundwater to seep into the mined-out areas

Depth of Groundwater table

Two aquifers are identified in the MRA. An upper water aquifer lies directly above a dolerite sill on average 10 to 15 m below surface. This sill is approximately 60 m thick. Farmers' boreholes are drilled to an average depth of 15 m. A second aquifer occurs below the dolerite sill in the sandstone above the No. 4 coal seam at an average depth of 180 m. According to the Groundwater Resources of South Africa (1995) Sheet 2, the storage coefficient of the underlying aquifer is expected to be less than 0.001. The recommended drilling depth below the groundwater level is 30 - 50 m. Fractures are restricted to a zone directly below the groundwater level. Groundwater drainage patterns in the area are generally related to surface water flow, such that groundwater divides coincide with watersheds.

The upper aquifer contains water of a quality that can be used by farmers for both domestic purposes and for watering cattle and sheep. The extent of the impact on the lower aquifer is not known, although it is assumed that the dewatering cone for this aquifer would be similar to that for the upper aquifer. Neither of the aquifers are important regional groundwater resources. The lower aquifer is too deep to be economically tapped by local farmers and the water quality is not suitable for irrigation purposes.

As the coal seam is extracted, the aquifers are broken and groundwater flows into the mined area. Not only is the volume of water significant, but also the water quality is poor and characterised by high sulphate, calcium and magnesium concentrations. Total extraction underground mining temporarily destroys the groundwater reserve. The pre-mining groundwater reserve is limited to the top 30 m of the stratigraphic column. Deeper down, almost no groundwater resources have been utilised due to the low permeability of the strata and the increased salinity of the groundwater at depth.



Groundwater Use

Farmers tap the upper aquifer locally for stock watering and minor domestic use. The lower aquifer is too deep to be economically tapped by local farmers and the water quality is not suitable for irrigation purposes.

Groundwater Zone

According to the Groundwater Resources of South Africa (1995) Sheet 2, the storage coefficient of the underlying aquifer is expected to be smaller than 0.001. The recommended drilling depth below the groundwater level is 30 - 50 m. Fractures are restricted to a zone directly below the groundwater level. Groundwater drainage patterns in the area are generally related to surface water flow. For this reason, groundwater divides coincide with watersheds.

Presence of Boreholes and Springs

At the start of mining, there were 223 boreholes and springs within the mine boundary area. The yield per borehole varied between 400 litres and 2 000 litres per hour as measured by NDC. Boreholes are pumped and tested by NDC as required or if an impact is suspected. Further information regarding the quantity and quality of the water extracted from the boreholes is available from the mine.

Groundwater Flow Evaluation

The two main sources of water that contribute to influx into the underground mine workings are from the surrounding groundwater and from the rainfall and run-off that infiltrates into the underground mines. The existing underground mining at NDC has extended over approximately 4 000 ha over the past \pm 18 years. If only bord and pillar mining was applied, the estimated current influx would have been in the order of 1 Ml/day. However, the estimated influx at NDC is significantly greater since both bord-and-pillar and longwall mining methods are employed. The collapsed structures above the longwall panels connect the underground mining areas with the overlying aquifers. Rainfall run-off can penetrate the ground above the longwall areas more easily through cracks.

Groundwater Quality

According to the Aquatico Scientific. January 2019 to March 2019. *New Denmark Colliery Quarterly Water Quality Assessment Report*. Four boreholes were monitored during the quarterly period and their positions are indicated in the figure below for the Central Shaft area.



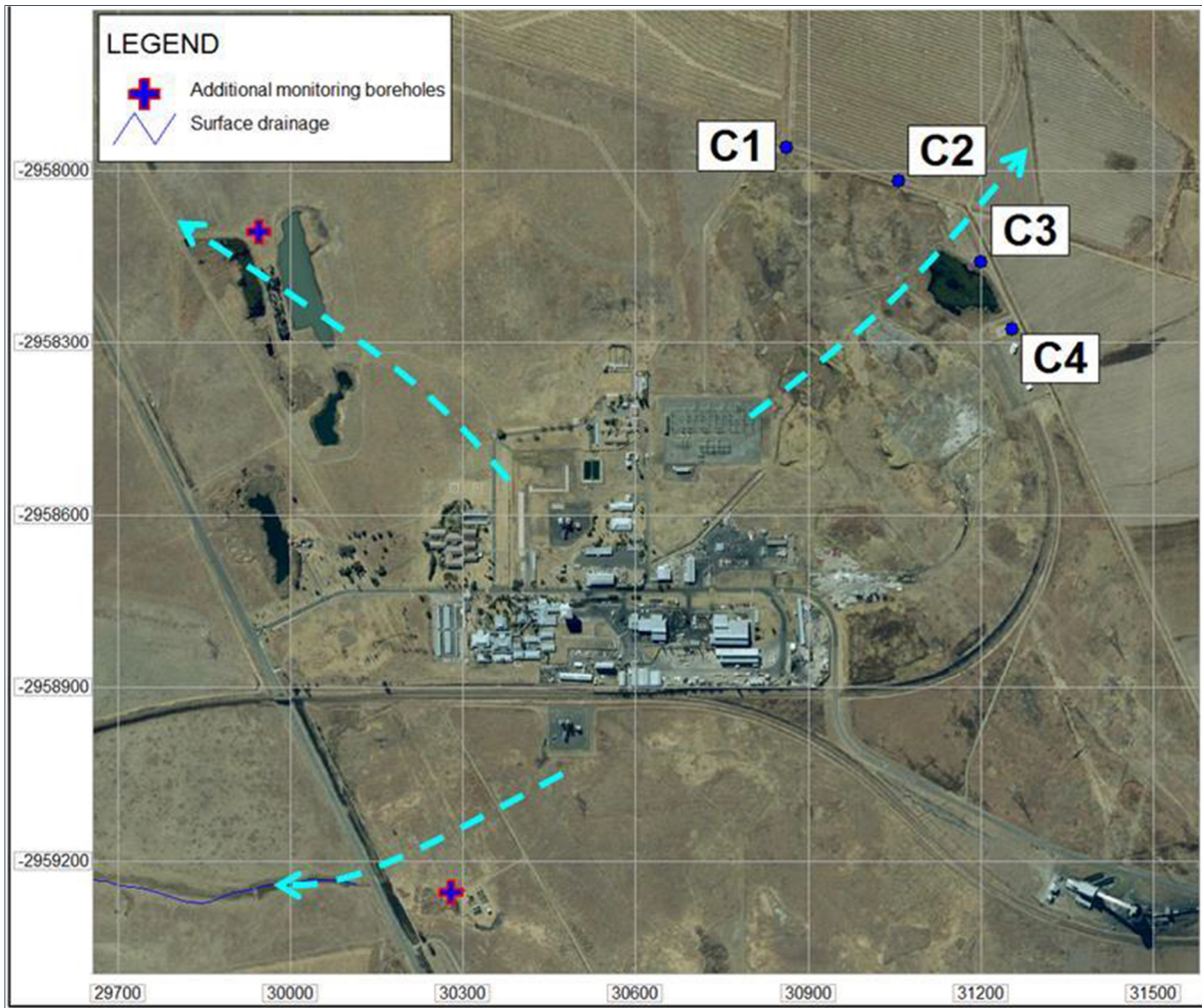


Figure 9: Surface layout map of the Central Shaft area.

The physical groundwater quality for C2 can be described as neutral, very saline and very hard; C3 can be described as neutral, non-saline and hard; C4 can be described as neutral, nonsaline and moderately hard. All the variables measured at all the groundwater localities complied with the WUL: 2016 limits for groundwater except SO₄ at C2 that exceeded the limit. In terms of the WUL: 2016 limits for groundwater, the water quality of these localities remained constant as compared to last quarterly period with a decrease in the SS concentrations and an increase in SO₄ concentration at C2 (refer to Table 21).

Table 21: Quarterly concentrations of the Central Shaft groundwater monitoring localities at NDC

AVERAGE DATA TABLE							
VARIABLE	UNITS	ASSESSMENT 1	ASSESSMENT 2	MONITORING LOCALITIES			
				C1	C2	C3	C4
pH @ 25°C	pH	5.0/9.7	5.0/9.7	-	7.55	7.65	7.85



AVERAGE DATA TABLE							
Electrical conductivity (EC) @ 25°C	mS/m	170	170	-	137	68.5	61.3
Total Dissolved solids @ 180°C	mg/l	1200	1200	-	1105	417	384
Total hardness	mg CaCO ₃ /l	-	-	-	387	252	169
Total alkalinity	mg CaCO ₃ /l	-	-	-	136	244	202
Fluoride (F)	mg/l	1.5	1.5	-	0.35	0.55	0.5
Calcium (Ca)	mg/l	-	-	-	87	51.5	32
Magnesium (Mg)	mg/l	-	-	-	53.5	26.5	19
Sodium (Na)	mg/l	200	200	-	125	54.4	61.5
Potassium (K)	mg/l	-	-	-	7	5	6.05
Chloride (Cl)	mg/l	300	300	-	46	15.5	35
Sulphate (SO ₄)	mg/l	500	500	-	549	125	52.5
Nitrate (NO ₃) as N	mg/l	11	11	-	8.7	0.075	7.4
Orthophosphate (PO ₄) as P	mg/l	-	-	-	0.05	0.05	0.05
Aluminium (Al)	mg/l	0.3	0.3	-	0.05	0.05	0.05
Iron (Fe)	mg/l	0.3	0.3	-	0.03	0.013	0.013
Manganese (Mn)	mg/l	0.1	0.1	-	0.169	0.023	0.013
Copper (Cu)	mg/l	2	2	-	0.005	0.005	0.005
Nickel (Ni)	mg/l	0.07	0.07	-	0.013	0.013	0.013
Lead (Pb)	mg/l	0.01	0.01	-	0.005	0.005	0.005
Zinc (Zn)	mg/l	5	5	-	0.013	0.013	0.013
Boron (B)	mg/l	2.4	2.4	-	0.166	0.11	0.049
Total suspended solids (TSS)	mg/l	-	-	-	8	9.7	0.9
TPH C10 - C40	µg/l	-	-	-	200	200	200

TPH (total petroleum hydrocarbons) concentrations were mostly below detection limit at all the borehole localities. Water quality according to the colour-coded classification system of the WRC (1998) “Quality of Domestic Water Supplies” can be classified as Good water quality (class 1) for C3 and C4 while C2 is classified as Marginal water quality (class 2) due to high SO₄ concentration recorded.



Chapter I: Air Quality

The proposed access road is situated within the Highveld Priority Area, one of the three declared airshed priority areas NDC employs both the longwall and bord- and-pillar underground mining methods. Currently, all mining activities at NDC occur underground, with the result that these activities will have low impact on surface air quality in the study area.

Chapter J: Noise

The following information was obtained from the *Environmental Impact Assessment and Environmental Management Programme submitted as contemplated in Section 39 (1) and Regulation 50 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) as part of a mining right application under Section 22(1) of the Act, Mining Right Application New Denmark Colliery DMRE Reference No. MP 30/5/1/2/2/ (74) MR*, dated 2005.

Acoustical problems arising from the mining activities at NDC and its location in regard to the rural environment are currently not a problem. Due to the rural setting of the site, it is not expected that the noise created at the mine will have any effect on the surrounding communities.

Chapter K: Archaeology and Cultural History

Heritage Resources

The following information was obtained from *A report of an Archaeological and built environment Heritage Impact Assessment for a proposed ventilation shaft at the new Denmark Colliery, Mpumalanga Province*, dated 2020 and compiled by Archaetnos Culture & Cultural Resource Consultants.

One grave site was identified. The grave site is about 100 m x 23 m in size and is located about 10 m east of the proposed project and consists of approximately 68 graves (refer to Figure 10 and Figure 11). Some of the graves were fenced in, but only the remains of a fence are still visible. The site is covered in grass. There are only a few grave goods on some of the more formal graves. Graves are orientated east to west.





Figure 10: Cemetery found during survey



Figure 11: One of the graves found during the survey

Paleontological Resources

A Palaeontological Impact Assessment (“PIA”) was conducted by Dr. Fourie titled: *Proposed Construction of the Ventilation Shaft Access Road Seriti Coal (Pty) Ltd.: New Denmark Colliery, Palaeontological Impact Assessment: Phase 1: Field Study*, dated August 2020. The PIA identifies palaeontological resources in the area to be developed and makes recommendations for protection or mitigation of these resources.

According to the above-mentioned study, formations present are part of the Karoo Supergroup. The Karoo Supergroup is renowned for its fossil wealth. Fossils in South Africa mainly occur in rocks of



sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity can generally be low to very high, and here locally very high for the Vryheid Formation and moderate for the Volksrust Formation.

The Volksrust Formation consists of a monotonous sequence of grey shale and fossils are significant, but very rarely recorded. Fossils include rare temnospondyl amphibian remains, invertebrates, minor coals with plant remains, fish scales, petrified wood, and low-diversity marine to non-marine trace fossil assemblages (Groenewald and Groenewald 2014).

The Eccca Group, Vryheid Formation may contain fossils of diverse non-marine trace, *Glossopteris* flora, mesosaurid reptiles, palaeoniscid fish, marine invertebrates, insects, and crustaceans (Johnson 2009). *Glossopteris* trees rapidly colonised the large deltas along the northern margin of the Karoo Sea. Dead vegetation accumulated faster than it could decay, and thick accumulations of peat formed, which were ultimately converted to coal. It is only in the northern part of the Karoo Basin that the glossopterids and cordaitales, ferns, clubmosses and horsetails thrived (McCarthy and Rubidge 2005).

The *Glossopteris* flora is thought to have been the major contributor to the coal beds of the Eccca. These are found in Karoo-age rocks across Africa, South America, Antarctica, Australia and India. This was one of the early clues to the theory of a former unified Gondwana landmass (Norman and Whitfield 2006).

Fossils likely to be found are mostly plants such as '*Glossopteris* flora' of the Vryheid Formation; refer to Figure 14 below. The aquatic reptile *Mesosaurus* and fossil fish may also occur with marine invertebrates, arthropods and insects. Trace fossils can also be present. During storms a great variety of leaves, fructifications and twigs accumulated and because they were sandwiched between thin films of mud, they were preserved to bear record of the wealth and the density of the vegetation around the pools. They make it possible to reconstruct the plant life in these areas and wherever they are found, they constitute most valuable palaeobotanical records (Plumstead 1963) and can be used in palaeoenvironmental reconstructions.



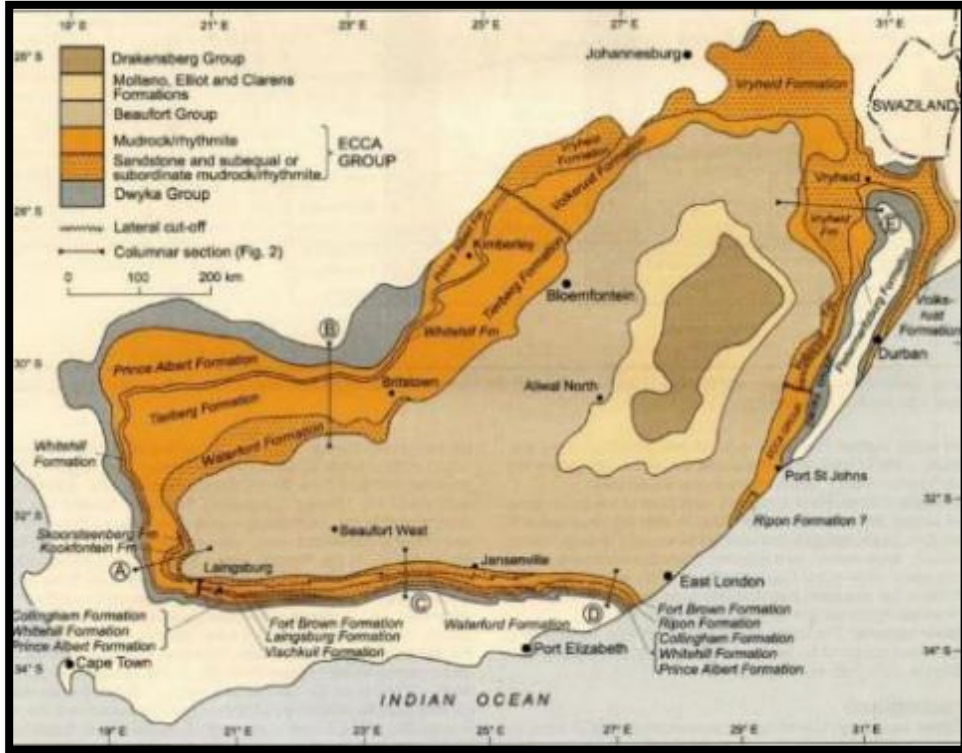


Figure 12: Extent of the Karoo Supergroup (Johnson 2009).

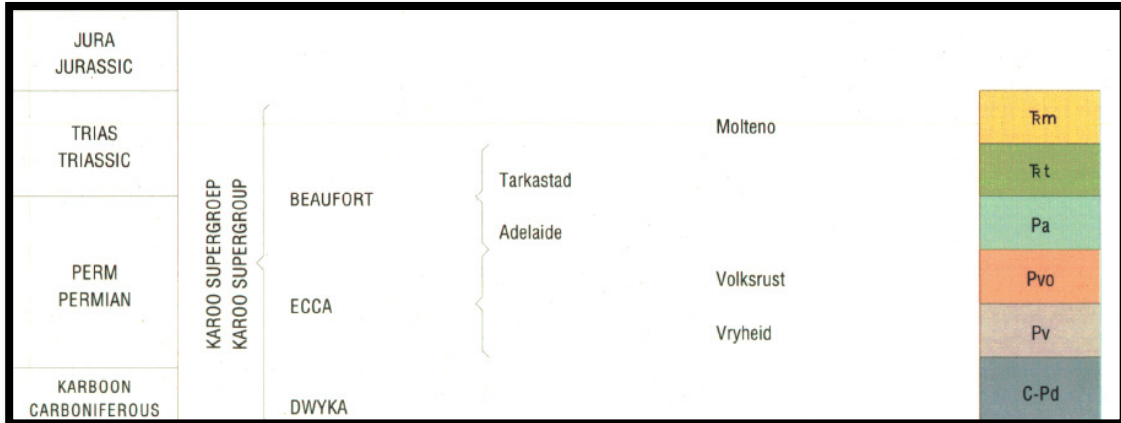


Figure 13: Lithostratigraphic column of the development area (Wolmarans and Linström 1988).



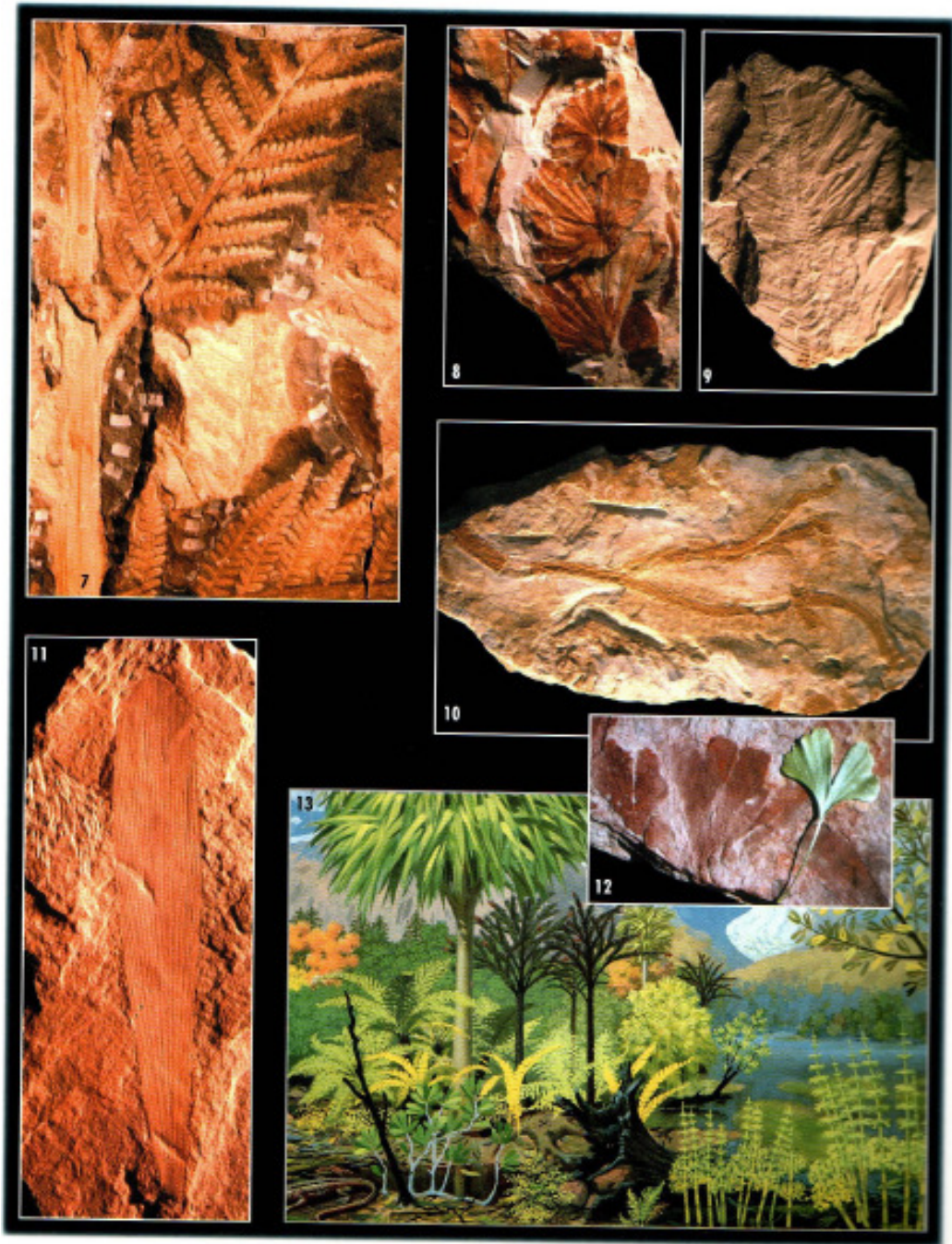


Figure 14: Fossils likely to be found in the Vrydheid formation (MacRae 1999).

Chapter L: Sensitive Landscapes

The following information was obtained from the *Environmental Impact Assessment and Environmental Management Programme* submitted as contemplated in Section 39 (1) and Regulation 50 of the *Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002)* as part of a mining right application under Section 22(1) of the Act, *Mining Right Application New Denmark Colliery DMRE Reference No. MP 30/5/1/2/2/ (74) MR*, dated 2005, and *Wetland delineation and water use risk assessment for the proposed vent shaft at Seriti New Denmark Colliery*, dated 2020 and compiled by WC Scientific (Pty) Ltd.



Two natural hydrogeomorphic wetland types were identified on site:

- Unchannelled Valley Bottom Wetland
- Seep Wetland.

These wetlands cover approximately 17.13 hectares, which makes up 6.3 % of the study area. In addition 2 small farm dams covering a further 2.73 hectares were identified on site. Delineated wetlands are illustrated in Figure 15 below.

The most significant wetland system on site and the system most likely to be impacted by the proposed project, is an Unchannelled Valley Bottom wetland draining from the centre of the project study area in an easterly direction towards the Leeuspruit. The wetland originates immediately below the Usutu Canal which traverses the site from south to north. A culvert conveys flows from upstream underneath the canal, while a valve also appears to discharge flows from the canal into the wetland. At the time of the site visit no flow was observed within the culvert underneath the canal while clear flow was observed in the wetland immediately downstream of the Usutu Canal. This flow was therefore presumed to be from releases out of the canal. A short distance downstream a small farm dam has been constructed across the wetland; the dam was full and overflowing at the time of the site visit. Downstream of the farm dam the wetland becomes a broad, flat unchannelled wetland system roughly 100 – 200m wide. The wetland is characterised by dark clayey soils that are considered to be vertic in nature.

The wetland is considered to be a naturally seasonal wetland system dependant on summer rainfall inputs. Wetness within the upper reach of the wetland upstream of the farm dam is expected to have substantially increased due to discharges from the Usutu Canal. This reach of the wetland is characterised by stands of *Juncus effusus*, with *Typha capensis* occurring immediately below the canal and *Schoenoplectus brachyceras* just upslope of the dam. These species indicate extended seasonal to near-permanent saturation of the wetland sediment and clearly show the influence of increased flow within the wetland. Downstream of the dam the vegetation indicates a more seasonal wetland system with typical species observed including *Eragrostis chloromelas*, *E. curvula*, *E. heteromera*, *Leersia hexandra*, *Cyperus esculentus*, *Eleocharis dregeana*, *Kyllinga erecta*, *Bidens formosa*, *Cirsium vulgare*, *Helichrysum aureonitens*, *Oenothera rosea*, *Plantago lanceolate*, *Pseudognaphalium luteo-album*, *Ranunculus multifidus*, *Rumex crispus* and *Verbena bonariensis*. This assemblage is considered more representative of a natural wetland system in this landscape setting.

Present Ecological Status (“PES”) Assessment

Based on the historical aerial imagery from 1968/9 the reference state of the Unchannelled Valley Bottom wetland is considered to be a seasonal, unchannelled wetland system driven predominantly by surface runoff following large or extended rain events, as well as some lateral seepage.

The system is expected to have been dominated by a range of grass species and occasional sedges. The most significant changes to the wetland include the construction of the dam within the wetland and the significantly increased flow through the wetland due to discharges from the Usutu canal. As flows within the Usutu canal are permanent in nature, discharges into the wetland occur throughout the year,



whereas a natural wetland system would expected surface water inputs only during the summer rainfall season. The presence of the dam has increased the inundation and saturation within the wetland, with the depth of inundation within the dam basin being such that all vegetation cover within the dam basin has been lost. Overflow from the dam occurs as a single narrow discharge, while natural flows would have been more diffusely spread across the width of the wetland. However, no erosion is evident in the wetland downstream of the dam, and the impact of increased flow is also mainly limited to the upper reach of the wetland (up to the dam). As a consequence, the upper reach of the Unchannelled Valley Bottom wetland is considered to be Largely Modified (PES category D), with most significant change related to the supporting hydrology of the wetland, while the lower reach is considered to be Moderately Modified (PES category C).

Wetland Importance and Sensitivity

The Unchannelled Valley Bottom wetland as well as most of the surrounding wetlands are considered to be of Moderate importance and sensitivity. This rating is based mostly Landscape Scale considerations such as the protection status of the wetland vegetation (poorly protected) and threatened status of the wetland vegetation type (critically endangered).

Chapter M: Visual aspects

The proposed access road leading to the new ventilation shaft is located within the mine area and cultivated agricultural fields. The proposed site is surrounded by agriculture, such as Marshland and tall grasses.

Chapter N: Regional socio-economic structure

The following information was obtained from the *Environmental Impact Assessment and Environmental Management Programme submitted as contemplated in Section 39 (1) and Regulation 50 of the Mineral and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) as part of a mining right application under Section 22(1) of the Act, Mining Right Application New Denmark Colliery DMRE Reference No. MP 30/5/1/2/2/ (74) MR*, dated 2005.

Gert Sibande is one of three districts in the Mpumalanga Province and is located in the south east portion of the province. According to a 2011 census, the Gert Sibande District Municipality has a total population of approximately 1 043 194 individuals, residing in 27 different towns and settlement areas throughout the region. NDC falls within the Lekwa Municipality, which is situated in the southern portion of the district (15% of district area) with the seat being located in Standerton and consisting of 15 wards. Standerton is the key urban node with Morgenzon as a major satellite node. The municipality's population was estimated to be 115 662 people in 2011 of which 25.9% of the potential economically active population are unemployed. The population is highly urbanised with the highest concentration of people living in Thutukani, which is located approximately 6 km south of NDC Central Shaft. The mine is contributing to the local, regional and national economy by job creation and is currently a significant employer in the district, both of skilled and unskilled labour. The mine has 945 permanent employees and about 692 contractors. Labour is mostly sourced from the town of Standerton, which not only



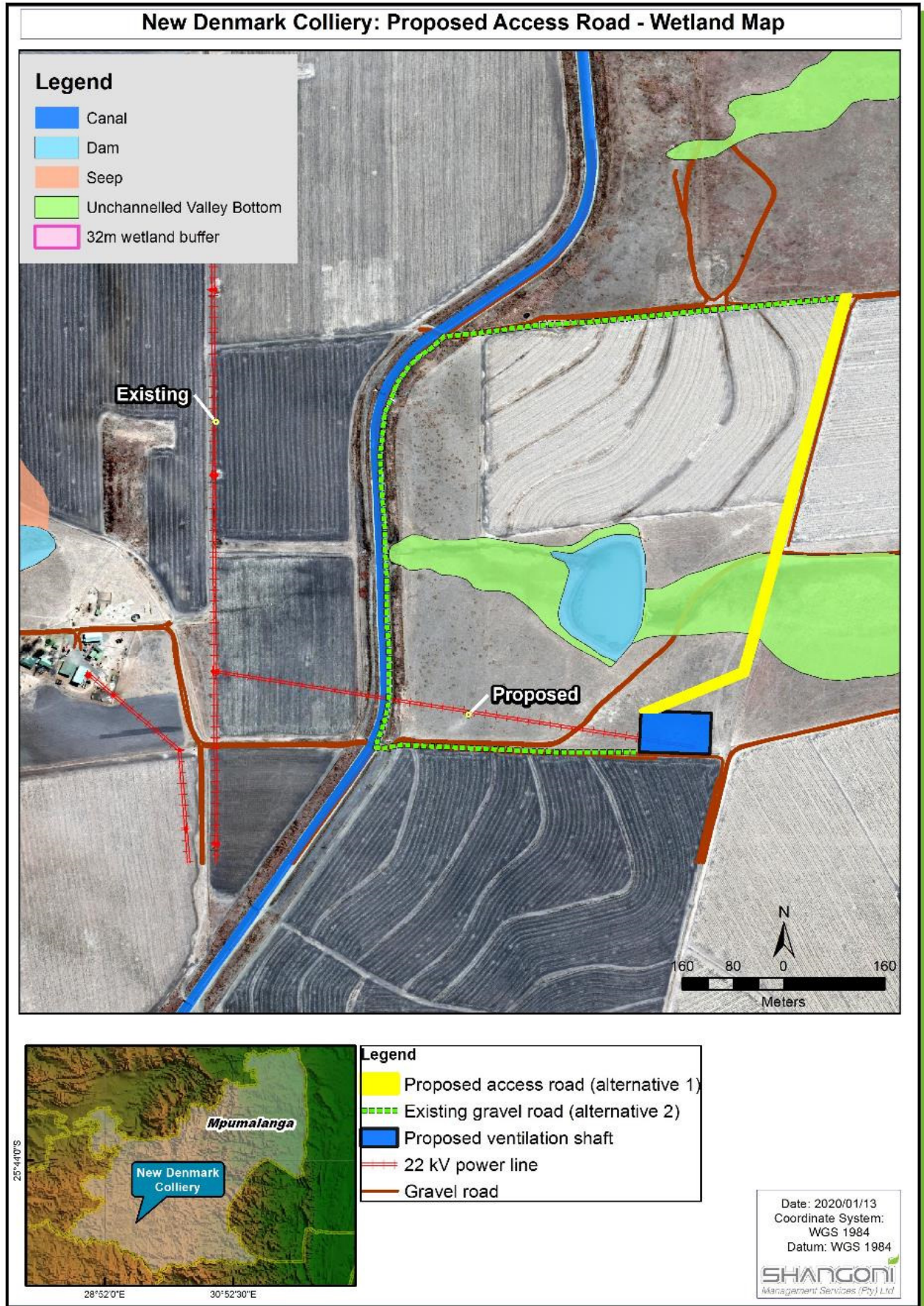
provides housing for the mining personnel, but has also become a hub for a number of guest houses and accommodation businesses that are supported by visitors to the nearby NDC and Tutuka power station. The area is served by the Gert Sibande District Municipality (Lekwa Local Municipality). The following key economic activities are conducted in the Gert Sibande District Municipality:

- Mining,
- Manufacturing,
- Agriculture,
- Electrification / power generation,
- Construction,
- Trade,
- Transport,
- Finance,
- Community Services, and Tourism.

7.4.2 Description of the current land uses

The proposed project will be situated on cultivated fields, and to be located within the artificial wetland formed by a farmer's dam and will cross the wetland (refer to Figure 5)





7.5 Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

Table 22 below contains preliminary potential impacts that have been identified for the activities described in the site layout plan.

Table 22: Preliminary determination of potential impacts

Environmental Component	Activity	Impact Description	Duration	Pre-mitigation ³⁷			Reversible (Yes/No)	Irreplaceable Loss (Yes/No)	Avoided/Managed /Mitigated
				Probability	Magnitude	Significance			
Geology	Construction and utilisation of the access road.	There are no impacts identified to Geology as a result of the construction and utilisation of access road.							
Topography	Construction and utilisation of access road.	The construction and utilisation of the access road will cause a temporary minor change in topography until the closure of the mine	Construction and operational	2	1	L	Yes	No	Manage; Mitigate
Soils	Construction and utilisation of access road.	There is a potential for loss of topsoil as a result of the construction and utilisation of access road. The hydrocarbon spills from the maintenance of vehicles and machinery equipment on site could result in soil contamination. Construction vehicles accessing the site, turning, offloading materials on site could also result in hydrocarbon spills.	Construction and operational	2	2	L	Yes	No	Mitigate
Land use and land capability	Construction and utilisation of access road.	The proposed development is located within cultivated agricultural fields, and will cross an unchannelled wetland. Therefore, there is a potential impact on the land use and a loss of land capability as a result of the construction and utilisation of the access road.	Construction and operational	2	1	L	Yes	No	Mitigate; Manage
Fauna and Flora	Construction and utilisation of access road.	No significant biodiversity impacts are expected as a result of an access road construction. There is a potential risk of faunal mortality along the road due to collision with moving vehicles. The site area is already disturbed due to cultivation. Therefore, the proposed activities will be less impactful on the biodiversity of an area.	Construction and operational	2	1	L	Yes	No	Mitigate

³⁷ H = High; M = Medium; L = Low



Environmental Component	Activity	Impact Description	Duration	Pre-mitigation ³⁷			Reversible (Yes/No)	Irreplaceable Loss (Yes/No)	Avoided/Managed /Mitigated
				Probability	Magnitude	Significance			
Surface water	Construction of access road.	<p>The activities will take place within or in close proximity to watercourse.</p> <p><u>Surface water quality</u></p> <p>There may be a decrease in surface water quality when any surface water run-off comes into contact with dust, eroded soil, carbonaceous materials or other pollutants generated during the construction phase of the proposed project.</p> <p>The sediment load within surface water runoff may increase if not prevented or mitigated, or the chemistry of surface water may be altered.</p> <p>Spillages of hazardous materials (i.e. oil, fuel, grease and / or cement) used during the construction of the proposed project may impact on the surrounding clean water environment.</p> <p><u>Surface water quantity:</u></p> <p>There could be a decrease in clean water runoff reporting to the catchment and potential impact on the availability of water to downstream users.</p>	Construction	3	1	L	Yes	No	Mitigate; Manage
Surface water	Utilisation of access road.	<p>There is a possible impact for contamination of surface water from the utilisation of the access road. This could be caused by the chemical spillages (oil, fuel) during the mobility of vehicles in the site area.</p> <p><u>Water quality</u></p> <p>Deterioration of water quality due to chemical contamination affecting the use of surface water as a natural resource.</p> <p><u>Water Quantity</u></p> <p>There could be a decrease in clean water runoff reporting to the catchment and potential impact on the availability of water to downstream users.</p>	Operational	2	1	L	Yes	No	Mitigate, Manage
Groundwater	Construction and utilisation of access road.	<p>There is a limited potential for contamination of ground water from hydrocarbon spillages during construction and utilisation of the access road.</p> <p>The impacts on groundwater quality are primarily related to the management of materials, and spills from construction operations. Contamination of groundwater may also arise due to incorrect handling of materials, and incorrect handling of cement for the culvert and bridge to be used. Due to the short exposure and small scale of these possible spills, the impacts will be negligible during the construction phase.</p>	Construction and operational	2	2	L	Yes	No	Mitigate; Manage



Environmental Component	Activity	Impact Description	Duration	Pre-mitigation ³⁷			Reversible (Yes/No)	Irreplaceable Loss (Yes/No)	Avoided/Managed /Mitigated
				Probability	Magnitude	Significance			
Wetlands (Access to crossing location)	Construction and operation of access road over wetland:	<ul style="list-style-type: none"> Disturbance of Wetland vegetation. Creation of preferential flow paths. Soil compaction. Increased sediment movement into wetlands. Flow impedance Increased erosion risk. Damage to channel banks. Spillage of contaminants leading to water quality impacts. Increase in alien vegetation. 	Construction and operational	2	2	L	No	Yes	Avoid, Manage
Wetlands:(Earh -works within wetland)				3	3	M			
Wetlands (Culvert installation)				3	2	M			
Wetlands (Flow alteration due to crossing)				3	2	M			
Wetlands (Hydrocarbon spills)				3	3	M			
Wetlands (Utilisation of road crossing)				3	2	M			
Air quality	Construction and utilisation of access road	<p>There may be impacts on the air quality of the area as dust fallout impacts relate to nuisance impacts as a result of the construction and utilisation of the access road.</p> <p>Dust and diesel fumes generated by machinery and vehicles could affect the air quality of the area.</p> <p>PM2.5 and PM10 impacts can in general be of concern to the construction team due to their direct health impact potentials. Such fine particles are able to be deposited in, and damaging to, the lower airways and gas-exchanging portions of the lung.</p>	Construction and operational	2	2	L	Yes	No	Mitigate; Manage
Noise	Construction of access road.	<p>There may be potential for noise to be generated as a result of the construction of the access road. Construction vehicles accessing the site, turning, offloading materials on site etc. are also likely to contribute to noise impact. Also, the noise of machines to be used when constructing the proposed infrastructures may contribute to noise effect. Due to the rural setting of the site, it is expected that the noise created will have minor effect on the surrounding landowners.</p>	Construction	2	1	L	Yes	No	Mitigate; Manage



Environmental Component	Activity	Impact Description	Duration	Pre-mitigation ³⁷			Reversible (Yes/No)	Irreplaceable Loss (Yes/No)	Avoided/Managed /Mitigated
				Probability	Magnitude	Significance			
Noise	Utilisation of access road.	There are very limited noise impacts during the operational phase of the proposed activities. The site is of rural setting, thus noise created will have minor impact on the surrounding land owners.	Operational	1	1	L	Yes	No	Mitigate; Manage
Visual	Construction and utilisation of access road.	There may be limited visual impacts from the construction and utilisation of the access road. The proposed activities are located within cultivated agricultural fields.	Construction and operational	2	1	L	Yes	No	Manage
Sites of Archaeological and Cultural Importance	Construction and utilisation of access road.	There is potential impact to the site of archaeological and cultural importance as a result of the construction and utilisation of the access road. The proposed development will take place 70 m away from the graves.	Construction and operational	2	1	L	Yes	No	Manage
	Construction of access road.	The Phase 1 Palaeontological Impact Assessment indicated that formations present are part of the Karoo Supergroup. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity can generally be low to very high, and here locally very high for the Vryheid Formation and moderate for the Volksrust Formation. Threats are earth moving equipment/machinery (for example haul trucks, front end loaders, excavators, graders, dozers) during construction, the sealing-in, disturbance, damage or destruction of the fossils by development, prospecting, mining, vehicle traffic, and human disturbance. Special care must be taken during the digging, drilling, blasting and excavating of foundations, trenches, channels and footings and removal of overburden not to intrude fossiliferous layers.	Construction	1	1	L	Yes	No	Mitigate; Manage
Socio-economic	Construction and utilisation of access road.	Jobs will be retained, providing income and, therefore, having a further positive impact on the regional socio-economy aspects of the area. This will relate primarily to job security (mine continuation).	Construction and operational	Positive			Yes	No	Manage



7.6 Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks

The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk. Impact assessments should be conducted based on a methodology that includes the following:

- Clear processes for impact identification, prediction and evaluation,
- Specification of the impact identification techniques,
- Criteria to evaluate the significance of impacts,
- Design of mitigation measures to lessen impacts,
- Definition of the different types of impacts (indirect, direct or cumulative), and
- Specification of uncertainties.

After all impacts have been identified, the nature of each impact can be predicted. The impact prediction will take into account physical, biological, socio-economic and cultural information and will then estimate the likely parameters and characteristics of the impacts. The impact prediction will aim to provide a basis from which the significance of each impact can be determined and appropriate mitigation measures can be developed.

The risk assessment methodology is based on defining and understanding the three basic components of the risk, i.e. the source of the risk, the pathway and the target that experiences the risk (receptor). Refer to Figure 16 below for a model representing the above principle (as contained in the DWS's Best Practice Guideline: *G4 – Impact Prediction*).

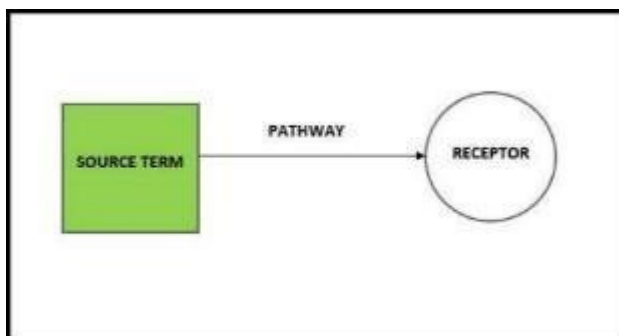


Figure 16 DWS's model for impact prediction (risk assessment).

Table 23 and Table 24 below indicate the methodology to be used in order to assess the Probability and Magnitude of the impact, respectively, and Table 25 provides the Risk Matrix that will be used to plot the Probability against the Magnitude in order to determine the Severity of the impact.



Table 23 Determination of Probability of Impact.

Score	Frequency of Aspect / Unwanted Event	Availability of Pathway from the source to the receptor	Availability of Receptor
1	Never known to have happened, but may happen	A pathway to allow for the impact to occur is never available	The receptor is never available
2	Known to happen in industry	A pathway to allow for the impact to occur is almost never available	The receptor is almost never available
3	< once a year	A pathway to allow for the impact to occur is sometimes available	The receptor is sometimes available
4	Once per year to up to once per month	A pathway to allow for the impact to occur is almost always available	The receptor is almost always available
5	Once a month - Continuous	A pathway to allow for the impact to occur is always available	The receptor is always available

Step 1: Determine the **PROBABILITY** of the impact by calculating the average between the Frequency of the Aspect, the Availability of a pathway to the receptor and the availability of the receptor



Table 24: Environmental impact assessment

Score		Source			Receptor	
	Duration of impact	Extent	Volume / Quantity / Intensity	Toxicity / Destruction Effect	Reversibility	Sensitivity of environmental component
1	Lasting days to a month	Effect limited to the site. (metres);	Very small quantities / volumes / intensity (e.g. < 50 ℓ or < 1 ha)	Non-toxic (e.g. water) / Very low potential to create damage or destruction to the environment	Bio-physical and/or social functions and/or processes will remain unaltered.	Current environmental component(s) are largely disturbed from the natural state.
2	Lasting 1 month to 1 year	Effect limited to the activity and its immediate surroundings. (tens of metres)	Small quantities / volumes / intensity (e.g. 50 ℓ to 210 ℓ or 1 ha to 5 ha)	Slightly toxic / Harmful (e.g. diluted brine) / Low potential to create damage or destruction to the environment	Bio-physical and/or social functions and/or processes might be negligibly altered or enhanced / Still reversible	Receptor of low significance / sensitivity
3	Lasting 1 – 5 years	Impacts on extended area beyond site boundary (hundreds of metres)	Moderate quantities / volumes / intensity (e.g. > 210 ℓ < 5000 ℓ or 5 – 8 ha)	Moderately toxic (e.g. slimes) Potential to create damage or destruction to the environment	Bio-physical and/or social functions and/or processes might be notably altered or enhanced / Partially reversible	Current environmental component(s) are moderately disturbed from the natural state.
4	Lasting 5 years to Life of Organisation	Impact on local scale / adjacent sites (km)	Very large quantities / volumes / intensity (e.g. 5000 ℓ – 10 000 ℓ or 8 ha– 12 ha)	Toxic (e.g. diesel & Sodium Hydroxide)	Bio-physical and/or social functions and/or processes might be considerably altered or enhanced / potentially irreversible	No environmentally sensitive components.
5	Beyond life of Organisation / Permanent impacts	Extends widely (nationally or globally)	Very large quantities / volumes / intensity (e.g. > 10 000 ℓ or > 12 ha)	Highly toxic (e.g. arsenic or TCE)	Bio-physical and/or social functions and/or processes might be severely/substantially altered or enhanced / Irreversible	Current environmental component(s) are a mix of disturbed and undisturbed areas.

Step 2: Determine the **MAGNITUDE** of the impact by calculating the average of the factors above. Table 25: Determination of severity of the impact.

Environmental Impact Rating / Priority					
Probability	Magnitude				
	1	2	3	4	5



Environmental Impact Rating / Priority					
	Minor	Low	Medium	High	Major
5 Almost Certain	Low	Medium	High	High	High
4 Likely	Low	Medium	High	High	High
3 Possible	Low	Medium	Medium	High	High
2 Unlikely	Low	Low	Medium	Medium	High
1 Rare	Low	Low	Low	Medium	Medium

Step 3: Determine the **SEVERITY** of the impact by plotting the averages that were obtained above for Probability and Magnitude in the table below.



7.7 The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

The positive and negative implication of the proposed activity and the alternative identified have been provided below and assessed in terms of the following four categories:

- Environmental.
- Technical/Engineering.
- Economical.
- Social.

Table 26: Advantages and disadvantages of the proposed activities and preliminary identified alternatives.

Alternative	Advantages	Disadvantages
Location (preferred)	<p>Environmental: Minimal surface disturbances during construction. Minimal loss of the landscape character.</p> <p>Technical/Engineer: Suitable for the designs of the engineers, with less complications for the construction to occur.</p> <p>Economical: Shortest available route to the ventilation shaft</p> <p>Social: Job opportunities will be retained, providing income for the local communities. Less dust impacts during the construction and operational phase compared to the alternative, also with less visual impact.</p>	<p>Environmental: The proposed access road will cross the delineated wetland and is going to have an impact on the wetland, but the impacts will be minimal if the identified mitigation measure are implemented. The access road is located within an unchanneled valley bottom wetland.</p> <p>Technical/Engineer: The location for the proposed activities is within and close to the watercourse, and there is a risk of difficulties in constructing culverts and the bridge within a watercourse.</p> <p>Economical: None.</p> <p>Social: None</p>
Alternative Option	<p>Environmental: The site is located further away from delineated wetland habitat. The site is currently cultivated and supports no natural vegetation.</p> <p>Technical/Engineer: Access to the site will not require any wetland crossings and existing servitude can be used.</p> <p>Economical: None</p> <p>Social: Job opportunities will be retained, providing income for the local communities.</p>	<p>Environmental: The use of the alternative road parallel to Usutu canal will affect the integrity of the canal wall because of the weight of the machines during construction.</p> <p>Technical/Engineer: The servitude does not allow heavy mine vehicles to use the alternative road.</p> <p>Economical: The costs will be higher, because the access road will have a longer length than the preferred option, thus construction will take longer to complete.</p> <p>Social: None</p>



Alternative	Advantages	Disadvantages
No-go option:	<p>Environmental: No environmental impacts (i.e. wetlands) associated with the construction of the proposed access road.</p> <p>Technical/Engineer: None identified.</p> <p>Economical: None identified.</p> <p>Social: None identified.</p>	<p>Environmental: None identified.</p> <p>Technical/Engineer: None identified.</p> <p>Economical: Will not be able to sustain safe working conditions for their employees who work underground if there is inadequate ventilation and they cannot maintain the minimum ventilation standards.</p> <p>Social: No employment opportunities will be created, also jeopardising the current workforce.</p>

7.8 The possible mitigation measures that could be applied and the level of risk.

The impact management measures and level of risk have been included under Section 7.5 of Part A.

7.9 Motivation where no alternative sites were considered.

Refer to section 7.1.

7.10 Statement motivating the alternative development location within the overall site.

Refer to section 7.1. Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.

All impacts and risks as identified are contained within Section 7.5. As further provided, is an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures. The methodology applied in assessing and ranking the impacts and risks on the preferred site and associated preferred alternatives is described in Section 7.6 Methodology used in determining and ranking potential environmental impacts and risks. The results of this assessments are provided below.



8 Assessment of each identified potentially significant impact and risk

Environmental Component (Aspects affected)	Activity	Impact description	Phase (Construction/Operational/Decommissioning/Closure/Post Closure)	Pre-Mitigation Significance	Mitigation Type (Modify/Remedy/Control/Stop)	Post Mitigation Significance.
Geology	Construction and utilisation of the access road.	There are no impacts identified to Geology as a result of the construction and utilisation of access road.				
Topography	Construction and utilisation of the access road.	The construction and utilisation of the access road will cause a temporary minor change in topography until the closure of the mine.	Construction and operational	L	Control	L
Soils	Construction and utilisation of the access road.	There is a potential for loss of topsoil as a result of the construction and utilisation of access road. The hydrocarbon spills from the maintenance of vehicles and machinery equipment on site could result in soil contamination. Construction vehicles accessing the site, turning, offloading materials on site could also result in hydrocarbon spills.	Construction and operational	L	Control	L
Land use and land capability	Construction and utilisation of the access road.	The proposed development is located within cultivated agricultural fields, and will cross an unchannelled wetland. Therefore, there is a potential impact on the land use and a loss of land capability as a result of the construction and utilisation of the access road.	Construction and operational	L	Control	L
Fauna and Flora	Construction and utilisation of the access road.	No significant biodiversity impacts are expected as a result of an access road construction There is a potential risk of faunal mortality along the road due to collision with moving vehicles. The site area is already disturbed due to cultivation. Therefore, the proposed activities will be less impactful on the biodiversity of an area.	Construction and operational	L	Control	L



Environmental Component (Aspects affected)	Activity	Impact description	Phase (Construction/Operational/ Decommissioning/ Closure/Post Closure)	Pre-Mitigation Significance	Mitigation Type Modify/Remedy/Control/Stop	Post Mitigation Significance.
Surface water	Construction of the access road.	<p>The activities will take place within or in close proximity to watercourse.</p> <p><u>Surface water quality</u> There may be a decrease in surface water quality when any surface water run-off comes into contact with dust, eroded soil, carbonaceous materials or other pollutants generated during the construction phase of the proposed project.</p> <p>The sediment load within surface water runoff may increase if not prevented or mitigated, or the chemistry of surface water may be altered.</p> <p>Spillages of hazardous materials (i.e. oil, fuel, grease and / or cement) used during the construction of the proposed project may impact on the surrounding clean water environment.</p> <p><u>Surface water quantity:</u> There could be a decrease in clean water runoff reporting to the catchment and potential impact on the availability of water to downstream users.</p>	Construction	L	Control	L
Surface water	Utilisation of the access road.	<p>There is a possible impact for contamination of surface water from the utilisation of the access road. This could be caused by the chemical spillages (oil, fuel) during the mobility of vehicles in the site area.</p> <p><u>Water quality</u> Deterioration of water quality due to chemical contamination affecting the use of surface water as a natural resource.</p> <p><u>Water Quantity</u> There could be a decrease in clean water runoff reporting to the catchment and potential impact on the availability of water to downstream users.</p>	Operational	L	Control	L



Environmental Component (Aspects affected)	Activity	Impact description	Phase (Construction/Operational/ Decommissioning/ Closure/Post Closure)	Pre-Mitigation Significance	Mitigation Type Modify/Remedy/Control/Stop	Post Mitigation Significance.
Groundwater	Construction and utilisation of the access road.	<p>There is a limited potential for contamination of ground water from hydrocarbon spillages during construction and utilisation of the access road.</p> <p>The impacts on groundwater quality are primarily related to the management of materials, and spills from construction operations. Contamination of groundwater may also arise due to incorrect handling of materials, and incorrect handling of cement to be used for the culvert and bridge construction.. Due to the short exposure and small scale of these possible spills, the impacts will be negligible during the construction phase.</p>	Construction and operational	L	Control	L
Wetlands (Access to crossing location)	Construction and operation of access road over wetland	<ul style="list-style-type: none"> • Disturbance of Wetland vegetation. • Creation of preferential flow paths. • Soil compaction. • Increased sediment movement into wetlands. • Flow impedence • Increased erosion risk. • Damage to channel banks. • Spillage of contaminants leading to water quality impacts. • Increase in alien vegetation. 	Construction and Operational	L	Control and remedy	L
Wetlands:(Earthworks within wetland)				M		L
Wetlands (Culvert installation)				M		L
Wetlands (Flow alteration due to crossing)				M		L
Wetlands (Hydrocarbon spills)				M		L
Wetlands (Utilisation of road crossing)				M		L



Environmental Component (Aspects affected)	Activity	Impact description	Phase (Construction/Operational/ Decommissioning/ Closure/Post Closure)	Pre-Mitigation Significance	Mitigation Type Modify/Remedy/Control/Stop	Post Mitigation Significance.
Air quality	Construction and utilisation of access road.	<p>There may be impacts on the air quality of the area as dust fallout impacts relate to nuisance impacts as a result of the construction and utilisation of the access road.</p> <p>Dust and diesel fumes generated by machinery and vehicles could affect the air quality of the area.</p> <p>PM2.5 and PM10 impacts can in general be of concern to the construction team due to their direct health impact potentials. Such fine particles are able to be deposited in, and damaging to, the lower airways and gas-exchanging portions of the lung.</p>	Construction and operational	L	Control	L
Noise	Construction and utilisation of access road.	<p>There may be potential for noise to be generated as a result of the construction of the access road. Construction vehicles accessing the site, turning, offloading materials on site etc. are also likely to contribute to noise impact. Also, the noise of machines to be used when constructing the proposed infrastructures may contribute to noise effect. Due to the rural setting of the site, it is expected that the noise created at the mine will have minor effect on the surrounding landowners.</p>	Construction	L	Control	L
Noise	Utilisation of access road.	<p>There are very limited noise impacts during the operational phase of the proposed activities. The site is of rural setting, thus noise created will have minor impact on the surrounding land owners.</p>	Operational	L	Control	L



Environmental Component (Aspects affected)	Activity	Impact description	Phase (Construction/Operational/Decommissioning/Closure/Post Closure)	Pre-Mitigation Significance	Mitigation Type (Modify/Remedy/Control/Stop)	Post Mitigation Significance.
Visual	Construction and utilisation of access road.	There may be limited visual impacts from the construction and utilisation of the access road. The site is located within the Mining Right Area and the surface rights belong to a farmer.	Construction and operational	L	Control	L
Sites of Archaeological and Cultural Importance	Construction and utilisation of access road.	There is potential impact to the site of archaeological and cultural importance as a result of the construction and utilisation of the access road. The proposed development will take place 70 m away from the graves.	Construction and operational	L	Control	L
	Construction of access road	The Phase 1 Palaeontological Impact Assessment indicated that formations present are part of the Karoo Supergroup. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity can generally be low to very high, and here locally very high for the Vryheid Formation and moderate for the Volksrust Formation. Threats are earth moving equipment/machinery (for example haul trucks, front end loaders, excavators, graders, dozers) during construction, the sealing-in, disturbance, damage or destruction of the fossils by development, prospecting, mining, vehicle traffic, and human disturbance. Special care must be taken during the digging, drilling, blasting and excavating of foundations, trenches, channels and footings and removal of overburden not to intrude fossiliferous layers.	Construction	L	Control	L
Socio-economic	Construction and utilisation of access road.	Jobs will be retained, providing income and, therefore, having a further positive impact on the regional socio-economy aspects of the area. This will relate primarily to job security (mine continuation).	Construction and operational	Positive	Control	Positive



9 Summary of specialist reports

List of studies undertaken	Recommendations of specialist reports	Specialist recommendations that have been included in the BAR report (Mark with an X where applicable)	Reference to applicable section of the report where specialist recommendations have been included.
Wetland Delineation and water use risk assessment, compiled by WCS Scientific (Pty) Ltd, dated 2020.	Construction must be undertaken during the dry season at a time where no flow occurs within the affected reach of the wetland.	X	Section 1.4.4 of Part B
	No impoundment of flow should occur upslope of the road crossing.	X	Section 1.4.4 of Part B
	The bridge design must make allowance for flow connectivity to be maintained across the full width of the wetland, i.e. across the full 130 m wide wetland front. This will need to be achieved via a series of culverts along the length of the crossing, ideally box culverts.	X	Section 1.4.4 of Part B
	Culvert invert must be the same as the natural ground level to prevent scouring at the outlet or head-cutting from the inlet.	X	Section 1.4.4 of Part B
	Bridge design and construction method statement accommodating these requirements must be submitted to the DWS as part of the General Authorisation application; and;	X	Section 1.4.4 of Part B
	The wetland report and recommendations for mitigation contained in this report must form part of the construction method statement.	X	Section 1.4.4 of Part B
A report of an Archaeological and built environment Heritage Impact Assessment for a proposed	The cultural significance of the grave site is High and the Field rating is Local Grade IIIB. The site should be included in the heritage register and may be mitigated. Mitigation is subject to a permit application lodged with the relevant heritage authority.		The grave site will be added to the mine's heritage register.



List of studies undertaken	Recommendations of specialist reports	Specialist recommendations that have been included in the BAR report (Mark with an X where applicable)	Reference to applicable section of the report where specialist recommendations have been included.
ventilation shaft at the new Denmark Colliery, Mpumalanga Province, compiled by Archaetnos Culture & Cultural Resource Consultants, dated 2020	In this instance two possibilities exist. The first option would be to fence the graves in and have a management plan drafted for the sustainable preservation thereof. This should be written by a heritage expert. This usually is done when the graves are in no danger of being damaged, but where there will be a secondary impact due to the activities of the mine.	X	Section 1.4.4 of Part B
	The second option is to exhume the mortal remains and then to have it relocated. This usually is done when the graves are in the area to be directly affected by the mining activities. For this a specific procedure, should be followed which includes social consultation. For graves younger than 60 years only an undertaker is needed. For those older than 60 years and unknown graves an undertaker and archaeologist is needed. Permits should be obtained from the Burial Grounds and Graves unit of SAHRA. This procedure is quite lengthy and involves social consultation.		The mine agreed to fence the site of the graves. No relocation of the mortal remains is going to take place.
	A proposed fencing of the cemetery is indicated in the development plan and accordingly Option 1 ³⁸ is recommended. The development is planned 70 m from the graves, which is regarded as an acceptable distance.	X	Section 1.4.4 of Part B
	The proposed development may continue after receiving comments from the relevant heritage authority and implementation of the mitigation measures indicated.	X	Section 1.4.4 of Part B

³⁸ Option 1= to fence the graves in and have a management plan drafted for the sustainable preservation thereof.



List of studies undertaken	Recommendations of specialist reports	Specialist recommendations that have been included in the BAR report (Mark with an X where applicable)	Reference to applicable section of the report where specialist recommendations have been included.
	It should be noted that the subterranean presence of archaeological and/or historical sites, features or artefacts is always a distinct possibility. Care should therefore be taken when development commences that if any of these are discovered, work on site immediate cease and a qualified archaeologist be called in to investigate the occurrence.	X	Section 1.4.4 of Part B
Proposed Construction of the Ventilation Shaft Access Road Seriti Coal (Pty) Ltd.: New Denmark Colliery, Palaeontological Impact Assessment: Phase 1: Field Study by Dr. Fourie, dated 2020.	There is no objection to the development, it was necessary to request a Phase 1 Palaeontological Impact Assessment: Field Study to determine whether the development will affect fossiliferous outcrops as the palaeontological sensitivity of the Vryheid Formation is VERY HIGH. A Phase 2 Palaeontological Mitigation is only required if fossils are found during construction of the road. Protocol is attached (Appendix 2).	X	Section 1.4.4 of Part B
	This project may benefit the economy, the life expectancy of the community, the growth of the community and social development in general.	X	Section 7.5 of part A
	Preferred choice: Preferred Alternative. Both Alternatives have the same impact.	X	Section 7.1 of part A
	The following should be conserved: if any palaeontological material is exposed during clearing, digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures.	X	Section 1.4.4 of Part B



10 Environmental impact statement

10.1 Summary of the key findings of the environmental impact assessment

This BAR and EMPr serves to identify the potential impacts associated with the activities of the associated project. In accordance with the relevant environmental legislation, reasonable measures to mitigate the potential impacts arising from the proposed activities have been assessed and the significance of each of these impacts under both the pre- and post-mitigation scenarios identified and detailed.

The methodology utilised to undertake the impact assessment has incorporated, amongst other skills, professional experience, relevant literature and local knowledge of the site and surrounding area.

It is the EAP's opinion that based on the process that has been followed and the findings of the impact assessment, in conjunction with the proposed mitigation measures, that no unmanageable adverse impacts are expected to occur and some positive impacts are expected.



11 Final Site Map

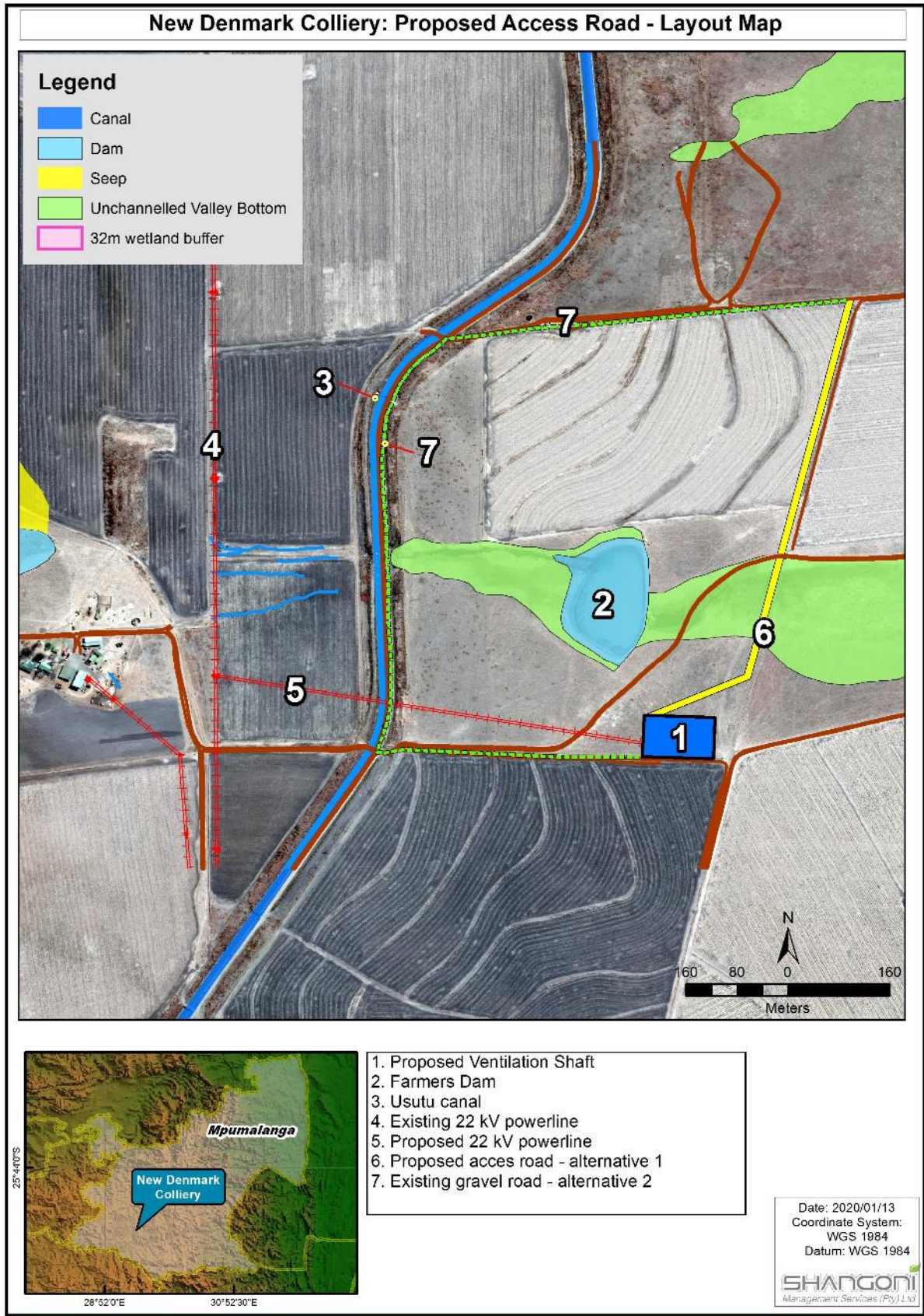


Figure 17: Site Layout Map



12 Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

Table 27: Summary of significant environmental impacts (negative), after mitigation.

Environmental Aspect	Significance Post Mitigation
TOPOGRAPHY	
The construction and utilisation of the access road will cause a temporary minor change in topography until the closure of the mine.	L
SOIL	
There is a potential for loss of topsoil as a result of the construction and utilisation of access road. The hydrocarbon spills from the maintenance of vehicles and machinery equipment on site could result in soil contamination. Construction vehicles accessing the site, turning, offloading materials on site could also result in hydrocarbon spills.	L
LAND USE AND LAND CAPABILITY	
The proposed development is located within cultivated agricultural fields, and will cross an unchannelled wetland. Therefore, there is a potential impact on the land use and a loss of land capability as a result of the construction and utilisation of the access road.	L
FAUNA and FLORA	
No significant biodiversity impacts are expected as a result of an access road construction There is a potential risk of faunal mortality along the road due to collision with moving vehicles. The site area is already disturbed due to cultivation. Therefore, the proposed activities will be less impactful on the biodiversity of an area.	L
SURFACE WATER	
The activities will take place within or in close proximity to watercourse.	L
Surface water quality: Spillages of hazardous materials (i.e. oil, fuel, grease and / or cement) used during the construction of the proposed project may impact on surrounding clean water environment. There may be a decrease in surface water quality when any surface water run-off comes into contact with dust, eroded soil, carbonaceous materials or other pollutants generated during the construction phase of the proposed project.	L
Surface water quantity: There could be a decrease in clean water runoff reporting to the catchment and potential impact on the availability of water to downstream users.	L
AIR QUALITY	



Environmental Aspect	Significance Post Mitigation
<p>There may be impacts on the air quality of the area as dust fallout impacts relate to nuisance impacts as a result of the construction and utilisation of the access road. PM2.5 and PM10 impacts can in general be of concern to the construction team due to their direct health impact potentials.</p>	<p>L</p>
<p>NOISE</p>	
<p>There may be potential for noise to be generated as a result of the construction of the access road. Construction vehicles accessing the sites, turning, offloading materials on site etc. are also likely to contribute to noise impact. Also, the noise of machines to be used when constructing the proposed infrastructure may contribute to noise effect. Due to the rural setting of the site, it is expected that the noise created at the mine will have minor effect on the surrounding landowners.</p>	<p>L</p>
<p>VISUAL ASPECTS</p>	
<p>There may be limited visual impacts from the construction and utilisation of the access road. The site is located within the Mining Right Area and the surface rights belong to a farmer.</p>	<p>L</p>
<p>GROUND WATER</p>	
<p>The impacts on groundwater quality are primarily related to the management of materials, and spills from construction operations. Contamination of groundwater may also arise due to incorrect handling of materials, and incorrect handling of cement for the culvert and bridge construction. Due to the short exposure and small scale of these possible spills, the impacts will be negligible during the construction phase.</p>	<p>L</p>
<p>SITE OF ARCHAEOLOGICAL AND CULTURAL IMPORTANCE</p>	
<p>There is potential impact to the site of archaeological and cultural importance as a result of the construction and utilisation of the access road. The proposed development will take place 70 m away from the graves.</p>	<p>L</p>
<p>The Phase 1 Palaeontological Impact Assessment indicated that formations present are part of the Karoo Supergroup. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity can generally be low to very high, and here locally very high for the Vryheid Formation and moderate for the Volksrust Formation. Threats are earth moving equipment/machinery (for example haul trucks, front end loaders, excavators, graders, dozers) during construction, the sealing-in, disturbance, damage or destruction of the fossils by development, prospecting, mining, vehicle traffic, and human disturbance. Special care must be taken during the digging, drilling, blasting and excavating of foundations, trenches, channels and footings and removal of overburden not to intrude fossiliferous layers.</p>	<p>L</p>
<p>SENSITIVE LANDSCAPES (INCLUDING WETLANDS)</p>	
<ul style="list-style-type: none"> • Disturbance of Wetland vegetation. • Creation of preferential flow paths. • Soil compaction. • Increased sediment movement into wetlands. • Flow impedance • Increased erosion risk. • Damage to channel banks. • Spillage of contaminants leading to water quality impacts. • Increase in alien vegetation. 	<p>L</p>



The proposed project will result in several positive impacts that relate primarily to economic growth and job creation as reflected in the table below.

Table 28: Summary of significant environmental impacts (positive), after mitigation.

Environmental Aspect	Significance Post Mitigation
SOCIO ECONOMIC	
Jobs will be retained, providing income and, therefore, having a further positive impact on the regional socio-economy aspects of the area. This will relate primarily to job security (mine continuation).	Positive

13 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

Based on the assessment and where applicable the recommendations from specialist reports, the table below summarises the impact management objectives and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

Table 29: Impact management objectives and the impact management outcomes

Environmental Aspect	Objective	Summary of impact management outcome
Topography	None	Not applicable
Air Quality	Prevent the deterioration of air quality	Dust fallout monitoring (monthly). If required, dust suppression on road should dust fallout monitoring identify concerns
Land use and capability	To prevent major disturbances within the site area during construction.	The disturbance area for the construction will be kept at a minimum and in the designated areas as per the approved layout plans.
Flora and Fauna	To prevent the proliferation and a further increase of alien invasive plant species within disturbed areas.	Implementation of the control of Alien Invasive Vegetation Procedure. Speed limits of the vehicles must be ≤40 km/hr;
Sensitive Landscapes (including wetlands)	To prevent deterioration of the wetlands.	Wetland monitoring and assessment plan (Monthly).



Environmental Aspect	Objective	Summary of impact management outcome
Surface water	To prevent quality deterioration of surface water quality, and to conserve the surface water resource to prevent impact on downstream water users.	To continue with the existing surface water monitoring programme, and extend to include for Leeuspruit river crossing. site inspections; spill management; incident reporting.
Groundwater	To minimise the extent of disturbance of the aquifer and to limit degeneration of groundwater quality and quantity.	Hydrocarbon management, through spill management and incident reporting (quarterly).
Noise	To minimise the amount of Noise generated during the construction of phase of the proposed project.	There must be a regularly maintenance of vehicles.
Visual aspects	To minimise the visual impact.	Implementation of rehabilitation plan after construction and during mine closure.
Sites of archaeological and cultural importance	Prevent the destruction of and loss of sites of cultural and archaeological importance.	The graves will be fenced in, and there will be a management plan drafted for sustainable preservation thereof. If any palaeontological material is exposed during construction activities, all construction activities must cease, a 30 m no-go barrier constructed and SAHRA contacted for further investigation.
Socio-economic aspects	Prevent socio economic impacts by employment opportunities.	Implementation of approved Social and Labour Plan.

14 Aspects for inclusion as conditions of Authorisation

Should the DMRE grant authorisation for this project, it should be subject to the following conditions:

- The proposed project should remain in full compliance with the requirements of the EMPr and with all regulatory requirements;
- The EMPr should be implemented by qualified environmental personnel who have the competence and credibility to interpret the requirements of the BAR and EMPr. Such persons must be issued with a written mandate by mine management to provide guidance and instructions to employees and contractors; and
- Stakeholder engagement must be maintained during all phases of the proposed project.



15 Description of any assumptions, uncertainties and gaps in knowledge

In terms of the EIA Regulations GN R982 Appendix 1(3)(o), the Environmental Assessment Practitioner (“EAP”) must provide a description of any assumptions, uncertainties and gaps in knowledge upon which the impact assessment has been based. The table below provides the assumptions and limitations applicable to the various specialist assessments.

Table 30: Specialist assumptions and limitations

Specialist	Assumptions and Limitations
<p>Wetland Delineation and water use risk assessment, compiled by WCS Scientific (Pty) Ltd, dated 2020.</p>	<ul style="list-style-type: none"> Wetland boundaries reflect the ecological boundary where the interaction between water and plants influences the soils, but more importantly the plant communities. The depth to the water table where this begins to influence plant communities is approximately 50 centimetres. This boundary, based on plant species composition, can vary depending on antecedent rainfall conditions, and can introduce a degree of variability in the wetland boundary between years and/or sampling period. Due to the scale of the remote imagery used (1:10 000 orthophotos and Google Earth Imagery), as well as the accuracy of the handheld GPS unit used to delineate wetlands in the field, the delineated wetland boundaries cannot be guaranteed beyond an accuracy of about 15m on the ground. Should greater mapping accuracy be required, the wetlands would need to be pegged in the field and surveyed using conventional survey techniques. it is recognised that the passage of time may affect the information and assessment provided in this report. WCSS's opinions are therefore based upon the information that was made available to WCSS and which existed at the time of compiling this report. Reference conditions of the wetland habitats are unknown. This limits the confidence with which the present ecological category (PES) is assigned.
<p>A report of an Archaeological and built environment Heritage Impact Assessment for a proposed ventilation shaft at the new Denmark Colliery, Mpumalanga Province, compiled by Archætnos Culture & Cultural Resource Consultants, dated 2020.</p>	<ul style="list-style-type: none"> Cultural Resources are all non-physical and physical man-made occurrences, as well as natural occurrences associated with human activity (Appendix A). These include all sites, structure and artefacts of importance, either individually or in groups, in the history, architecture and archaeology of human (cultural) development. Graves and cemeteries are included in this. The significance of the sites, structures and artefacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. The various aspects are not mutually exclusive, and the evaluation of any site is done with reference to any number of these aspects. Cultural significance is site-specific and relates to the content and context of the site. Sites regarded as having low cultural significance have already been recorded in full and require no further mitigation. Sites with medium cultural significance may or may not require mitigation depending on other factors such as the significance of impact on the site. Sites with a high cultural significance require further mitigation (see Appendix C). The latitude and longitude of any archaeological or historical site or feature, is to be treated as sensitive information by the developer and should not be disclosed to members of the public.



Specialist	Assumptions and Limitations
	<ul style="list-style-type: none"> All recommendations are made with full cognizance of the relevant legislation. It must be mentioned that it is almost impossible to locate all the cultural resources in a given area, as it will be very time consuming. Developers should however note that this report should make it clear how to handle any other finds that might occur. The vegetation cover on site varies in density and height from open patches with low growing crops(soya) and short grass to areas with medium high plant growth. In general both the horizontal and the vertical archaeological visibility was good.
<p>Proposed Construction of the Ventilation Shaft Access Road Seriti Coal (Pty) Ltd.: New Denmark Colliery, Palaeontological Impact Assessment: Phase 1: Field Study by Dr. Fourie, dated 2020.</p>	<ul style="list-style-type: none"> Most development areas have never been surveyed by a palaeontologist or geophysicist. Variable accuracy of geological maps and associated information. Poor locality information on sheet explanations for geological maps. Lack of published data. Lack of rocky outcrops. Inaccessibility of site. Insufficient data from developer and exact lay-out plan for all structures.

16 Reasoned opinion as to whether the proposed activity should or should not be authorised

16.1 Reasons why the activity should be authorised or not

In accordance with the EIA Regulations GN R982 (3)(l), the EAP must provide an opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation must be stated.

An impact assessment has been undertaken using qualified specialists, which will incorporate extensive consultation with and participation of interested and affected parties.

In terms of collectively considering ecological, social and economic impacts it is important to remember that while there might be some trade-offs between the considerations, in South Africa all development must in terms of Section 24 of the Constitution be ecologically sustainable, while economic and social development must be justifiable. There are, therefore, specific "trade-off" rules that apply. Environmental integrity may never be compromised, and the social and economic development must take a certain form and meet certain specific objectives in order for it to be considered justifiable.

Given that NDC is existing mine, the EAP is of opinion that economic benefit will be derived from the construction of the proposed access road as it provides access to the new vent shaft, a necessary requirement to improve the ventilation standards within the underground mine. As described above, impacts associated with the proposed project have a low environmental impact significance if the recommended mitigation measures are effectively implemented.

In terms of collectively considering ecological, social and economic impacts, the proposed activities should be allowed provided that the management objectives and management measures as presented



in this BAR and EMPr are implemented to effectively manage, prevent, control and / or stop environmental impacts from occurring. The most significant environmental risk identified is the potential wetland impacts due to the crossing of the proposed access road over the wetland. The wetland specialist found that if the recommended mitigation measures are effectively implemented, then no significant environmental risk will result. The EAP is of opinion that this project should be authorised.

16.2 Conditions that must be included in the authorisation

Should the DMRE grant authorisation for this project, it should be subject to the following conditions:

- The proposed project should remain in full compliance with the requirements of the EMPr and with all regulatory requirements;
- The EMPr should be implemented by qualified environmental personnel who have the competence and credibility to interpret the requirements of the EMPr. Such persons must be issued with a written mandate by mine management to provide guidance and instructions to employees and contractors; and
- Stakeholder engagement must be maintained during all phases of the proposed project.

16.3 Rehabilitation requirements

A closure and rehabilitation plan will be compiled and submitted for approval prior to closure of the New Denmark Colliery. Final rehabilitation and closure of the proposed access road forms part of such plan.

17 Period for which the Environmental Authorisation is required

New Denmark Colliery's Mining Right is valid until 2039. Therefore, the period for which environmental authorisation is required is at least 20 years (from the date of approval provided by the DMRE).

18 Undertaking

The undertaking by the EAP is provided in Section 2 of Part B (Environmental Management Programme) below. This undertaking confirms: the correctness of the information provided in the reports, the inclusion of comments and inputs from stakeholders and I&APs (where received), the inclusion of inputs and recommendations from available specialist and monitoring reports, where relevant, and the acceptability of the proposed project in relation to the finding of the assessment and level of mitigation proposed.

19 Financial Provision

19.1 Explain how the aforesaid amount was derived.

The total estimated unscheduled and scheduled closure costs for NDC, as at March 2019, amount to approximately R650.5 million and R771.4 million, respectively (including Preliminary and Generals at 15% and excluding contingencies and VAT, as summarised on the table below.



Table 31: *Unscheduled and scheduled closure costs for New Denmark, as at March 2019*

Closure components		Unscheduled closure (2018)	Scheduled closure (2019)
1	Infrastructure aspects	R 94 953 968.82	R 94 953 968.82
2	Mining aspects	R 79 120 488.98	R 72 088 739.23
3	General surface rehabilitation	R 82 092 456.47	R 82 092 456.47
4	Water supply to farmers	R 2 664 098.82	R 2 664 098.82
	Sub- Total 1	R 258 831 013.09	R 251 799 263.34
5	Additional Allowances		
5.1	Additional studies	R 500 000.00	R -
	Sub- Total 2	R 500 000.00	R -
6	Pre-site Relinquishment Monitoring and Aftercare		
6.1	Surface water monitoring	R 2 984 977.80	R 2 984 977.80
6.2	Groundwater monitoring	R 718 286.70	R 718 286.70
6.3	Rehabilitation monitoring	R 2 441 143.66	R 2 441 143.66
6.4	Care and maintenance	R 2 696 185.33	R 2 696 185.33
	Sub-Total 3	R 8 840 593.49	R 8 840 593.49
	Closure Total Excl. VAT. (Sub-total 1 +2 +3)	R 268 171 606.58	R 260 639 856.83
7	Residual Closure Costs		
7.1	Water treatment	R 343 169 327.62	R 472 837 855.11
7.2	Subsidence	R 356 460.00	R 182 043.62
	Sub-Total 4	R 343 525 787.62	R 473 019 898.73
	Residual Closure Total Excl. VAT. (Sub-total 4)	R 343 525 787.62	R 473 019 898.73
8	Closure costs including P&Gs and contingencies		
8.1	Preliminary and general (15%)	R 38 824 651.96	R 37 769 889.50
8.2	Contingencies	R -	R -
	Sub-Total 5	R 38 824 651.96	R 37 769 889.50
	Total Excl. VAT. (Sub-total 1 +2 +3+4)	R 611 697 394.20	R 733 659 755.56
	Grand Total (Incl. P&Gs) Excl. VAT	R 650 522 046.16	R 771 429 645.06
	Grand Total Incl. VAT @ 15% (Sub-total 1 +2 +3+4+5)	R 748 100 353.08	R 887 144 091.82
Percentage change comparison with previous costs			



Closure components	Unscheduled closure (2018)	Scheduled closure (2019)
V&M (Dec) 2017 Closure Costs excl. water treatment and VAT	R 271 867 716.38	R 253 642 523.40
March 2019 Closure Costs (above) excl. water treatment and VAT	R 307 352 718.54	R 298 591 789.94
% Change (excl. water treatment costs and VAT)	13%	18%

39

19.2 Confirm that this amount can be provided for from operating expenditure.

The rehabilitation costs for the proposed project will be determined as required in terms of Section 24P of the National Environmental Management Amendment Act, 2008 (Act No. 62 of 2008) and will be calculated based on the DMR Guideline for the calculation of the quantum. This amount will be reflected in the annual financial provisioning/closure cost for the whole mine.

20 Specific Information required by the competent Authority

20.1 Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the BAR report must include the:

20.1.1 Impact on the socio-economic conditions of any directly affected person.

Results of investigation, assessment and evaluation of impact on any directly affected person	Reference to where mitigation is reflected
<p>New Denmark indicates that it strives to:</p> <ul style="list-style-type: none"> Promote employment and advance the social and economic welfare of all employees; Contribute to the transformation of the industry; and Be actively involved in the community whereby funds are made available for the development of local infrastructure and social upliftment. 	Part A Section 7.5



20.2 Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

Results of investigation, assessment and evaluation of impact on any national estate	Reference to where mitigation is reflected
There is a site of archaeological and cultural importance identified on the proposed site. The proposed access road will be constructed 70 m away from the graves located close to the proposed site. No national estates will be impacted on as a result of the proposed project.	Part A Section 7.5

21 Other matters required in terms of sections 24(4)(a) and (b) of the Act.

An impact assessment for the proposed project has been undertaken and will incorporate extensive consultation with and participation of interested and affected parties. Applying the hierarchical approach to impact management were firstly considered to avoid negative impacts, but where avoidance was not possible, to better mitigate and manage negative impacts. The wetland impacts were identified as part of the risk assessment (Part A -Section 8),to be most significant, due to the crossing of the proposed access road over the delineated wetland. But with the effective implementation of the mitigation measures, there will be no significant impacts posing threat on the environment. Furthermore, the environmental impact statement (Part A Section 7.5) summarises the key findings of the environmental impact assessment and negative implications of the proposed project.



PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME

REPORT

1 Environmental Management Programme

1.1 Description of the aspects of the activity

The requirement to describe the aspects of the activity that are covered by the environmental management programme is included in Part A, Section 4.

1.2 Details of the EAP

The requirements for the provision of the detail and expertise of the EAP are included in Part A, Section 1.2.



1.3 Composite Map

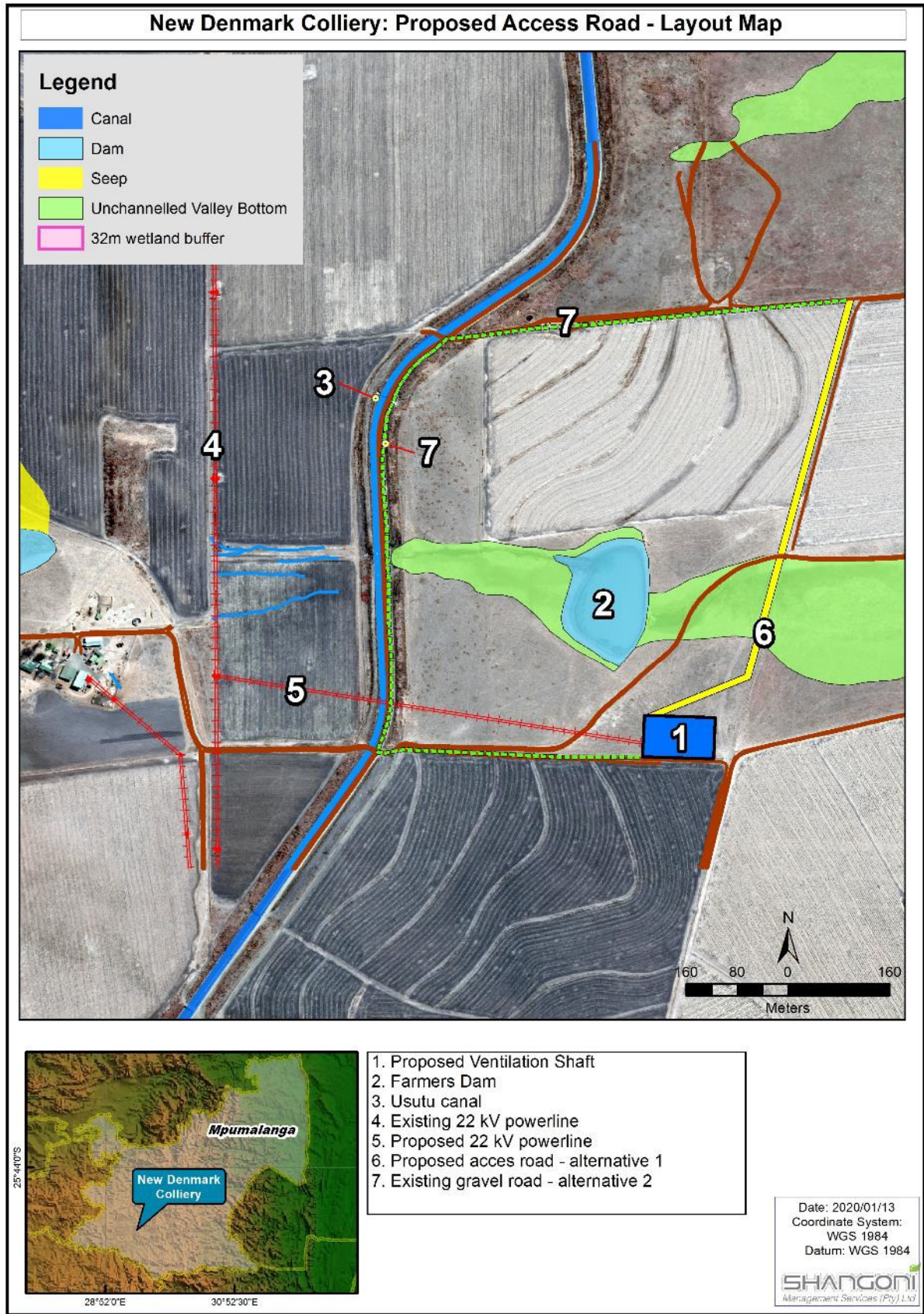


Figure 18: Site Layout Map



1.4 Description of impact management objectives including management statements

1.4.1 Determination of closure objectives.

The existing closure objectives as per the *Review and Update of New Denmark Colliery Unscheduled and Scheduled Closure Costs Aligned to NEMA Financial Provisioning Regulations (Golder Associates, Report No. 18100254-325109-8)* will apply to the proposed construction of the access road, and include the following:

Roads (paved):

- Remove asphalt surfaces, crush to aggregate, and stockpile on site for beneficial re-use by third-party.
- Remove concrete structures (culverts).
- Rip and shape footprint area (including cuttings) to be free-draining, aligned to site-wide drainage plan.
- Establish vegetation by incorporating appropriate amendments where required and by applying a suitable seed mix.

Roads (haul/unpaved)

- Rip and shape footprint area to be free-draining, aligned to site-wide drainage plan.
- Establish vegetation by incorporating appropriate amendments where required and by applying a suitable seed mix.

1.4.2 Volumes and rate of water use required for the operation.

Water tankers will be used for dust suppression, if required. The water will be obtained from the existing operations and in accordance to the quantities as specified in the existing Water Use Licence.

1.4.3 Has a water use licence has been applied for?

NDC will be required to apply for a GA for Section 21 (c) and (i) for water use activities.



1.4.4 Impacts to be mitigated in their respective phases

Table 32 Measures to mitigate the impacts associated with the proposed access road.

Environmental Aspects	Activities	Phases	Scale of disturbances (Volumes, tonnage and hectares or m ²)	Mitigation Measures	Compliance with standards	Time period for implementation
Geology	Construction and utilisation of the access road.		There are no impacts identified to Geology as a result of the construction and utilisation of access road.			
Topography	Construction and utilisation of the access road.	Construction and operational	7 000 m ²	The disturbance area for the construction will be kept at a minimum and in the designated areas as per the approved layout plans.	The disturbance area for the construction will be kept at a minimum and in the designated areas as per the approved layout plans.	Construction
Soils	Construction and utilisation of the access road.	Construction and operational	7 000 m ²	<p>Topsoil and subsoil will be stripped from the proposed footprint areas before construction starts. All topsoil stockpiles should also be protected by berms to prevent erosion of stockpiled material and to divert surface water runoff around the material. Topsoil stockpiles should not have steep slopes that encourage the possibility of erosion</p> <p>Topsoil stockpiles should not exceed a height of 1.5 metres.</p> <p>The stockpiles should be vegetated with indigenous vegetation, or covered with plastic sheeting to prevent it from the wind blowing within the site area.</p> <p>Alien vegetation should be removed from the stockpiles.</p> <p>Disturbed surface areas will be kept as small as possible.</p>	In compliance with principles contained in the MPRDA, 2002 and NEMA, 1998.	Construction and operational
Land Use and Land Capacity	Construction and utilisation of the access road.	Construction and operational	7 000 m ²	<p>Disturbed land use areas must be covered with topsoil to a similar depth as prior to the proposed project.</p> <p>Soil that has been contaminated by oil, grease or hydraulic fluid spills will be cleaned up by removing and disposing thereof in an appropriate waste disposal receptacle.</p> <p>Vehicle maintenance must not occur on site. All maintenance must occur at the existing workshop.</p> <p>All vehicle and equipment usage should be limited to designated areas only. Manage oil and fuel by storing it in designated bunded areas (if any storage will occur at the site). Cement must be placed in designated areas.</p> <p>No dumping or impounding of rubble, litter, garbage or discards of any description, whether solid or liquid, shall take place on the site other than in the demarcated areas.</p>	In compliance with principles contained in the MPRDA, 2002 and NEMA, 1998.	Construction
Flora and Fauna	Construction and utilisation of the access road.	Construction and operational	7 000 m ²	<p>The disturbance area for construction will be kept at a minimum and in the designated areas as per the approved layout plans.</p> <p>Speed limits of the vehicles must be ≤40 km/hr, to minimise any risk of collision with fauna.</p> <p>Indigenous floral species must be replanted on the site that is not affected by the construction and operation of the proposed activities. Only locally occurring indigenous species should be used for revegetation.</p>	<p>General implementation of activities taking Mining and Biodiversity Guidelines into account.</p> <p>Development and implementation of Alien vegetation management plan.</p>	Construction



Environmental Aspects	Activities	Phases	Scale of disturbances (Volumes, tonnage and hectares or m ²)	Mitigation Measures	Compliance with standards	Time period for implementation
Surface Water	Construction of the access road.	Construction	7 000 m ²	<p>Activities taking place during the construction must be limited to the designated areas only, and not outside of the designated areas as specified in the layout map.</p> <p>Soil stockpile must be kept in designated areas.</p> <p>All vehicle and equipment usage should be limited to designated areas only. Manage oil and fuel by storing it in designated bunded areas. Cement must be placed in designated areas.</p> <p>Vehicle maintenance must not occur on site; all maintenance must occur at the existing mine workshop.</p> <p>Treat all hydrocarbon spills as hazardous, and dispose of accordingly.</p>	In line with the DWS Best Practice Guidelines, to prevent and minimise impacts and to ensure the separation of clean and dirty water management areas; GN704, dated 1999; the NWA (1998) and Regulations there under and amendments thereto	Construction
Surface Water	Utilisation of the access road.	Operational	7 000 m ²	<p>Conduct thorough regular maintenance on the water management infrastructure (bridge and culvert) to ensure continuous clean water flow.</p>	In line with the DWS Best Practice Guidelines, to prevent and minimise impacts and to ensure the separation of clean and dirty water management areas; GN704, dated 1999; the NWA (1998) and Regulations there under and amendments thereto	Operational
Groundwater	Construction and utilisation of the access road.	Construction and operational	7 000 m ²	<p>Prevent or contain contamination from spilling and oil leaks from vehicles, equipment and drill rigs.</p> <p>Vehicle maintenance must not occur on site; all maintenance must occur at the existing mine workshop.</p> <p>Construction activity management should ensure that any materials handling does not pose a material risk to soil, surface water and groundwater pollution.</p>	In line with the DWS Best Practice Guidelines, to prevent and minimise impacts and to ensure the separation of clean and dirty water management areas; GN704, dated 1999; the NWA (1998) and Regulations there under and amendments thereto	Construction
Wetlands (Access to crossing location) Wetlands:(Earthworks within wetland)	Construction and utilisation of the access road.	Construction and operational	7 000 m ²	<p>It is Important that the bridge design allows for the maintenance of flow connectivity across the full width of the unchannelled valley bottom wetland:</p> <p>Allowance must be made to fully cater for expected surface runoff during flood events and to ensure maintenance of flow across the full width of the wetland downstream of the crossing through the installation of numerous culverts along the crossing. Installation of a series of box culverts is preferred over pipe culverts.</p>	<p>In line with the engineering designs.</p> <p>In line with the DWS Best Practice Guidelines, to prevent and minimise impacts and to ensure the separation of clean and dirty water management areas; GN704, dated 1999; the NWA (1998) and</p>	Construction and Operational



Environmental Aspects	Activities	Phases	Scale of disturbances (Volumes, tonnage and hectares or m ²)	Mitigation Measures	Compliance with standards	Time period for implementation
Wetlands (Culvert installation)				<p>Downstream of the culvert erosion protection measures should be implemented. The erosion protection measures should serve to stabilise the wetland sediments immediately below the culvert outlets, slow down flows discharged from the culverts and assist in dispersing flows across the wetland.</p> <p>Habitat fragmentation is unavoidable when a road is constructed across wetland habitat and difficult to mitigate. The road should be kept as narrow as possible and slow speed limits should be enforced on the road to minimise risk of wildlife collisions. The road must be removed and the disturbed footprint fully rehabilitated following completion of mining.</p> <p>The proposed road servitude should be kept as narrow as possible and must be carefully demarcated in the field prior to the onset of any construction or vegetation clearing activity. All construction activity must be limited to the demarcated area. The disturbance footprint should be kept as small as possible.</p> <p>Construction should ideally take place during low-flow periods. Unprotected bare soils during flood events could lead to severe erosion and soil loss. Construction should therefore ideally take place in winter.</p> <p>Construction activity must be carefully planned and supervised to allow the proposed project schedule to be implemented without undue delays. A scenario of incomplete or partially completed work left standing for extended periods must be avoided.</p> <p>Disturbed areas outside the road footprint should be re-vegetated as soon as possible following completion of construction activities.</p> <p>Only locally occurring indigenous species should be used for revegetation.</p> <p>An alien vegetation management plan must be developed and implemented.</p> <p>Stormwater runoff from the road must be adequately catered for in the road design. No direct discharge of sediment rich stormwater into the wetland should be allowed. Stormwater should ideally be discharged into terrestrial grassland.</p>	<p>Regulations there under and amendments thereto</p> <p>Development and implementation of alien vegetation management plan.</p>	
Wetlands (Flow alteration due to crossing)						
Wetlands (Hydrocarbon spills)						
Wetlands (Utilisation of road crossing)						
Air quality	Construction and utilisation of the access road.	Construction and operational	7 000 m ²	<p>Dust suppression along the gravel road, and other disturbed areas.</p> <p>Dust fallout monitoring plan must be developed and effectively implemented.</p> <p>Effective maintenance of diesel driven vehicles to manage the greenhouse gases.</p>	<p>Dust suppressing methods to reduce dust to comply with the Dust Control Regulation GNR 827 of 2013 and NEM: AQA, 2004.</p>	Construction
Noise	Construction and utilisation of the access road	Construction	7 000 m ²	<p>All equipment and vehicles must be regularly serviced to prevent excessive noise. Vehicles and equipment generating excessive noise should be fitted with appropriate noise abatement measures.</p> <p>Personal Protective Equipment (“PPE”) must be worn at all times during construction of the proposed activities. PPE register to be kept.</p>	<p>SABS Code of Practice 0103 of 2008: The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication.</p> <p>SABS Code of Practice 0328 of 2008: Environmental Noise Impact Assessments.</p> <p>Adherence to the Mine Health and Safety Act.</p>	Construction



Environmental Aspects	Activities	Phases	Scale of disturbances (Volumes, tonnage and hectares or m ²)	Mitigation Measures	Compliance with standards	Time period for implementation
Visual	Construction and utilisation of the access road.	Construction and operational	7 000 m ²	Remove inoperative equipment and maintain good housekeeping.	Implementation of rehabilitation plan	Construction and operational
Sites of Archaeological and Cultural Importance	Construction and utilisation of the access road.	Construction and operational	7 000 m ²	<p>The graves must be fenced and management plan must be drafted for the sustainable preservation thereof.</p> <p>Upon finding any archaeological or historical material all work at the affected area must cease.</p> <p>The area should be demarcated in order to prevent any further work there until an investigation has been completed.</p> <p>An archaeologist should be contacted immediately to provide advice on the matter.</p> <p>Should it be a minor issue, the archaeologist will decide on future action. Depending on the nature of the find, it may include a site visit. South African Heritage Resources Authority's ("SAHRA") APM Unit may also be notified.</p> <p>If needed the necessary, permit will be applied for with SAHRA. This will be done in conjunction with the appointed archaeologist.</p> <p>The removal of such archaeological material will be done by the archaeologist with the approval given by SAHRA, including any conditions stipulated by the latter.</p> <p>Work on site will only continue after the archaeologist/ SAHRA has agreed to such a matter.</p>	In compliance with the National Heritage Resources Act (Act No. 25 of 1999)	Construction
	Construction of the access road.	Construction	7 000 m ²	If any palaeontological material is exposed during construction activities, all construction activities must cease, a 30 m no-go barrier constructed and SAHRA contacted for further investigation.	In compliance with the National Heritage Resources Act (Act No. 25 of 1999)	Construction
Socio-economic	Construction and utilisation of the access road.	Construction and operational	Local and regional	<p>As many skilled and unskilled workers, as possible, should be sourced from the local communities, towns and surrounding areas</p> <p>Implementation of development training will help low-skilled labourers to get good experience and advance skills, thus be able to work on other mines in future.</p> <p>The site workers and contractors will adhere to the requirements of Mine Health and Safety Act, Act 29 of 1996.</p>	<p>Continued implementation of approved Social and Labour Plan.</p> <p>Continued compliance with the Mine Health and Safety Regulations under the Mine Health and Safety Act (1996).</p>	Construction and operational



1.5 Mechanisms for monitoring compliance with and performance assessment against the environmental management programme

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

- Monitoring of Impact Management Actions;
- Monitoring and reporting frequency;
- Responsible persons;
- Time period for implementing impact management actions; and
- Mechanism for monitoring compliance

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements for Monitoring	Roles and Responsibilities (For the Execution of The Monitoring Programmes)	Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions
Spills/Incidents	Spillages of hazardous chemicals or oil spills from vehicles or equipment.	Site must be inspected on a weekly basis to ensure that no incidents have occurred. A spills incident register must be kept by the contractor on site. In the event of a spill, the internal environmental department must be informed of such.	Site officer to ensure that all incidents are recorded and reported to the Environmental Superintendent. Site officer to ensure that employees are trained on spills management.	As specified by the Environmental Department
Air quality	Dust generated from the construction of the proposed activities.	Dust fallout monitoring must continue as per the Air quality monitoring plan.	Environmental Manager to ensure that monitoring on site is conducted by the specialist.	Dust monitoring (monthly)
Health and safety	Structural risk associated with the construction and operation of the proposed activities.	SHE inspections must be undertaken by the SHE officer to ensure structural stability during the construction and operation of the proposed project.	SHE officer must ensure that the SHE inspections are undertaken for the duration of the activity.	Weekly.
Noise	Noise associated with the construction vehicles accessing the site, turning, offloading materials on site etc. Also, the noise of machines to be used when constructing the proposed infrastructure.	Correct PPE to be worn.	Site officer to ensure that PPE is issued to all employees/contractors.	As specified by the Environmental Department at the mine.
Wetland destruction	Disturbance of Wetland vegetation. Soil Compaction. Erosion risk Spillage of contaminants leading to water quality impacts. Increase in alien vegetation. Flow impedance Increased sediment movement into	Wetland Monitoring programme Development and implementation of alien vegetation management plan.	Environmental Manager to ensure that monitoring on site is conducted by the specialist.	Wetland Monitoring programme (weekly)
Soil contamination	The hydrocarbon spills from the maintenance of vehicles and machinery equipment on site. Construction vehicles accessing the site, turning, offloading materials could influence hydrocarbon spills.	Site inspection must occur on a weekly basis to ensure that no incidents have occurred. Vehicles and machinery equipment must be regularly serviced. A spills incident register must be kept by the contractor on site.	Environmental Manager to ensure that monitoring is done accordingly and only at the workshop.	As specified by the Environmental Department at the mine.



1.6 Indicate the frequency of the submission of the performance assessment/ environmental audit report.

An environmental audit should be conducted annually and submitted to the DMRE annually.

1.7 Environmental Awareness Plan

1.7.1 Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

The following Environmental Awareness Training will be implemented by NDC in order to inform employees and contractors of the environmental risk that may result from their work, or the risk of their interaction with the sensitive environment. The training will be conducted as part of the induction process for all new employees (including contractors) that will perform work in terms of the proposed activities. Proof of all training provided must be kept on-site.

Scope

The Environmental Training Procedure applies to all persons who work on behalf of or for NDC whose work may create a significant impact on the environment.

Objectives

The objectives of the Environmental Training Procedure are as follows:

- To identify environmental training needs as required by the Environmental Management System (“EMS”) Standard ISO14001; and
- To ensure that any person, on behalf of NDC, performing tasks which have the potential to cause a significant impact upon the environment is competent on the basis of appropriate education, training or experience and will retain associated records.

Responsibilities

The Environmental Superintendent is the Master of the Environmental Training Procedure. The Training Manager is the Activity Manager for this procedure and is responsible for keeping this Standard Procedure up to date as well as to ensure that the relevant persons, who have responsibilities under the procedure, follow the instructions in this Standard Procedure.

Responsibilities of the Training Superintendent include:

- The development, reviewing and updating of this procedure,
- Implementation of the training procedure,
- Conducting of training as specified, and
- Keeping this procedure and its supporting documentation up to date.

Responsibilities of the Environmental Superintendent include:

- Ensuring that the environmental induction module is regularly updated and presented at weekly induction, and



- To identify new environmental training needs and facilitate the training process by developing training programmes and providing materials and information.

Procedure/ Methodology

The procedure followed with regards to environmental training at the mine is described in this section.

Identification of training needs:

The Environmental Superintendent, in conjunction with the Training Manager , will identify NDC's environmental training needs of all persons working for or on behalf of NDC, taking the following into consideration:

- Analysis of non-conformances and incidents
- In-task observation of performance,
- Significant Environmental Impacts, and
- Environmental Aspect Register.

Training needs may change due to additions to the scope in services provided or due to the updating of procedures (quality, technical and administrative) and will be updated accordingly.

Induction / ex-leave training

The induction / ex-leave training can be described as follows:

- All employees attend induction training when initially employed and upon returning from annual leave. All contractors attend NDC's induction training before commencing work and, should they remain on site, annually thereafter,
- The Environmental Coordinator / delegate conducts a presentation on environmental management at NDC during the induction programme,
- Resource conservation, environmental reporting and general environmental awareness for mine related issues are included in induction,
- Training attendance forms are completed for each candidate and recorded both electronically and manually. Records of attendance are maintained by the Training Department, and
- A Computer Based Assessment is completed after the environmental training to confirm understanding of training content.

Department specific / on-the-job training

A job specific training programme is developed for each department, concentrating on the major risk and impact areas identified in the EMS workshops. The training focuses on the following:

- Waste prevention and control,
- Water usage,
- Energy consumption,
- Storage and handling of chemicals,
- Storage and handling of petroleum products,



- Pollution control,
- Spillages and clean up of spillages, and
- Rehabilitation.

The Environmental Co-ordinator and the Training Superintendent, in liaison with the Training Course Co-ordinator, will co-ordinate the training.

Environmental awareness and EMS training

All personnel

All persons working for or on behalf of NDC will undergo induction, a part of which is environmental awareness training. At the end of this training, all persons will be required to complete the awareness test and the level of awareness will be assessed by the Training Department. Re-testing or induction may be required. The training centre will ensure that all persons working for or on behalf of the organisation are aware of the following:

- The importance of conformity with the environmental policy and procedures and with the requirements of the management system,
- The significant environmental aspects related with actual or potential impacts associated with their work and the environmental benefits of improved personal performance,
- Their roles and responsibility in achieving conformity with the Environmental Policy and procedures and with the requirement of the EMS, and
- The potential consequences of departure from specific operating procedures.

All persons working for or on behalf of NDC performing tasks which can cause significant or major environmental impacts shall be competent on the basis of training, education and / or experience.

Visitors

All visitors to any controlled access areas of NDC will undertake a shorter "visitor's induction", which highlights the main safety and environmental aspects relevant to short-term visitors at the mine.

EMS representatives

The EMS representatives have additional EMS knowledge requirements. The Environmental Co-ordinator will ensure that the EMS representatives receive the training required to manage the EMS in their areas of responsibility efficiently. Such skills include the operation of the Safety Health and Environmental ("SHE") legal register and the electronic database, as well as thorough knowledge of the environmental procedures.

The EMS representatives are responsible for ensuring that the employees under their responsibility receive training in those procedures (i.e. significant aspects) that have been identified as relevant in that particular area.



Evaluation

The staff of the Training Department, together with line management, will carry out evaluation of awareness and competency training via planned task observations. Awareness and competence will also be assessed during audits via incident reporting and planned task observations.

Certification

Photocopies of certificates (where applicable) issued after completion of a training course shall be maintained in the employees' training file kept at the Training Centre.

Managerial training

The Environmental Co-ordinator will conduct or schedule management training, covering the contents and aims of ISO14001 on an ad hoc basis. Attendance records of such training will be kept and supplied to the Training Centre for entry on individual training records.

Training material development review

Training material is updated by the Environmental Co-ordinator as and when changes to procedures, policy or legislation occur, in consultation with the Training Superintendent.

Documents and reports checklists records

The records and reports that will be maintained in the employees' training file are indicated in Table 33: Records and reports maintained in employees training file.

Table 33: Records and reports maintained in employees training file

Report title	Type of report / document	Reporting frequency
Personnel qualifications	Certificates	As required
Training needs	Matrix / audits	As required
Certificates	Course certificates	As required
Training programmes/ courses attended	Attendance records	As required
Staff induction	Attendance records	Annually

1.8 Specific information required by the Competent Authority

The following information will be required by the competent authority.

Information	Frequency of submission
Quantum of Financial Provision	Annually
Environmental Audit Report on approved BAR and EMPr.	Annually or as per auditing timeframe indicated in authorisation(s)



2 Undertaking

The EAP herewith confirms

- the correctness of the information provided in the reports
- the inclusion of comments and inputs from stakeholders and I&APs ;
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed;

Name: Minnette Le Roux

Date: 2020-08-31
Project Code SER-NED-19-12-12

Signature of EAP

31 August 2020


Date

3 Declaration of independence

Shangoni hereby declares that it is an independent auditor in that it has no business, financial, personal or other interest in this project in respect of which Shangoni is appointed. Furthermore, no circumstances exist that may compromise the objectivity of Shangoni, excluding fair remuneration for work performed in connection with this project.

Report compiled

by:

Name: Olwethu Mungwe

Date: 2020-08-31
Project Code SER-NED-19-12-12


Olwethu Mungwe
(Cand.Sci.Nat)

Report reviewed by:

Name: Minnette Le Roux

Date: 2020-08-31
Project Code SER-NED-19-12-12

Minnette Le Roux
(Pri.Sci.Nat)

Name: Brian Hayes

Date: 2020-08-31
Project Code SER-NED-19-12-12

Brian Hayes (Pr Eng)

