TerraAfrica

SOIL. AGRICULTURE. ENVIRONMENT.

Soil and Agricultural Assessment for the Proposed Railway Extension at South32's Wessels Mine

Submitted by TerraAfrica Consult cc

Mariné Pienaar
(MSc. Environmental Science)
(SACNASP Registered Scientist)

30 August 2021

Declaration of the Specialist

Details of practitioner

Report author: M Pienaar
Contact number: 082 828 3587
Email address: mpienaar@terraafrica.co.za
Physical address: 7 Smuts Street, Wolmaransstad, 2630

SACNASP Registration Number: 400274/10

Declaration of Independence

I, Mariné Pienaar, hereby declare that TerraAfrica Consult, an independent consulting firm, has no interest or personal gains in this project whatsoever, except receiving fair payment for rendering an independent professional service.

I further declare that I was responsible for collecting data and compiling this report. All assumptions, assessments and recommendations are made in good faith and are considered to be correct to the best of my knowledge and the information available at this stage.

TerraAfrica Consult cc represented by M Pienaar
30 August 2021

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

TerraAfrica Consult cc was appointed by SLR Consulting (South Africa) Pty Ltd (SLR) to conduct the soil and agricultural assessment for the Basic Assessment process required for the proposed extension of the existing railway infrastructure at South32 Limited's Wessels Mine (from here onwards referred to as Wessels Mine). Wessels Mine is located approximately 1.5 km north-east of Blackrock and 15 km north of Hotazel in the Joe Morolong Local Municipality, located in the John Taolo Gaetsewe District Municipality of the Northern Cape Province (

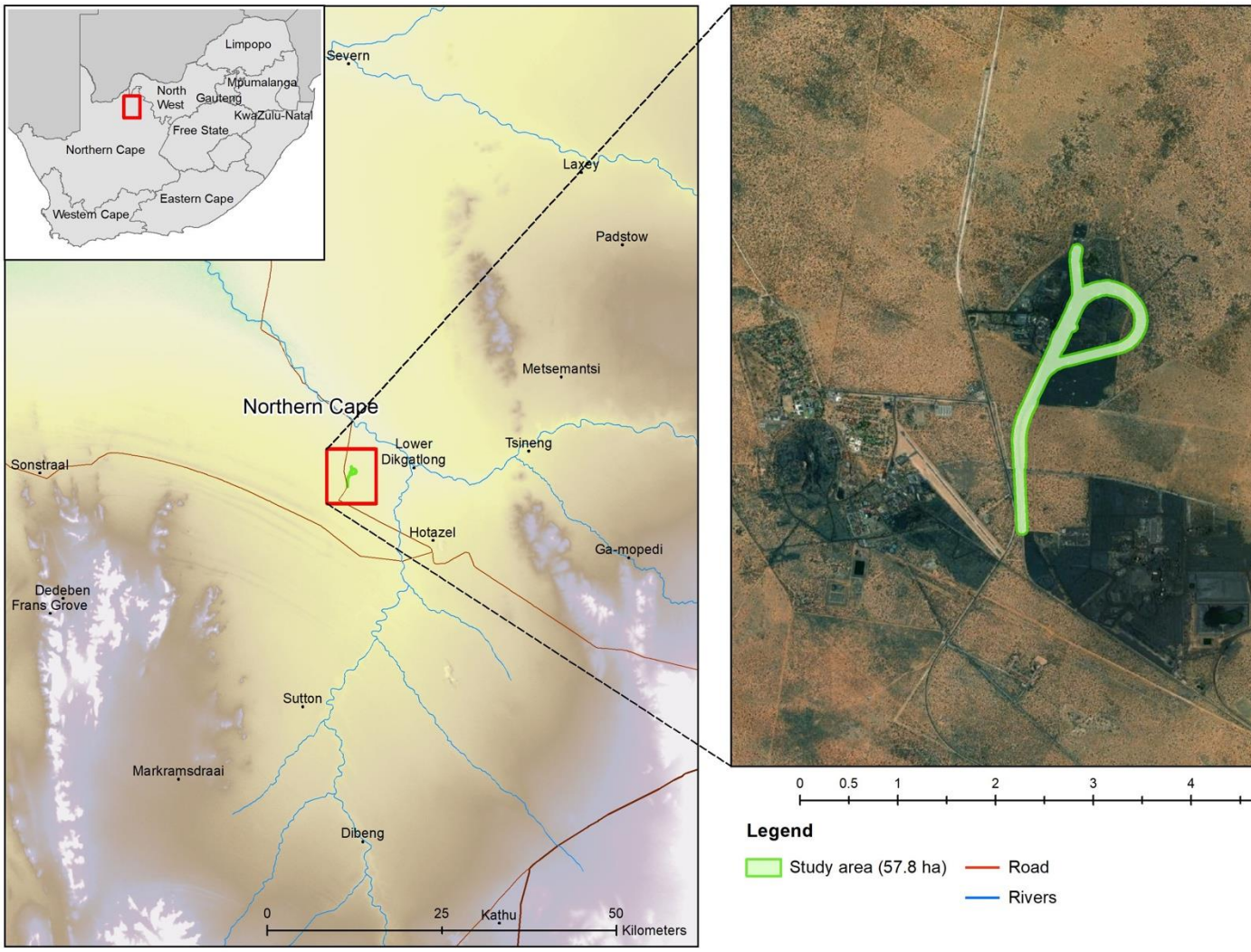


Figure *1*).It is an operational underground manganese mine operating at a depth of approximately 350 m below surface.

2. PROJECT DESCRIPTION

South32 has a Manganese Export Corridor Allocation on the Transnet Freight Rail (TFR) manganese line between Hotazel, in the Northern Cape, and Coega, in the Eastern Cape. The allocation is underutilised due to train loading inefficiencies of the current railway

configuration at the Wessels Mine. Additionally, TFR has initiated a manganese expansion programme which will increase manganese export capacity by upgrading the rail network. TFR plans to increase capacity of the manganese rail line beyond the current four million tonnes per annum to 16 million tonnes per annum.

In order to meet the TFR's extended capacity requirements, the loading rates at the Wessels Mine need to be improved. In this regard, Hotazel Manganese Mines (Pty) Ltd, a subsidiary of South32, is proposing to extend and upgrade the existing railway infrastructure at the Wessels Mine. The layout map is provided in Figure *2*. The scope of work for the proposed project includes the following:

- The extension of the existing railway into a new railway balloon measuring at approximately 2 500 m long and 25 m wide;
- The extension of the railway onto a section of the existing tailings dam resulting in the removal of approximately 15 000 – 25 000 m^3 of material from the tailings area, which would be deposited on another existing tailings dam; and
- The upgrade of the existing railway line from the Wessels Mine to the tie-in point near Assmang (Pty) Ltd's (Assmang) railway line.

The duration of the construction phase of the proposed project is anticipated to be approximately 15 months. A staff complement of approximately 250 individuals would be required for the construction phase (skilled and unskilled job opportunities). Procurement opportunities would be sourced locally, as far as possible. Due to the nature of the proposed project, no job or procurement opportunities will be created post-construction.

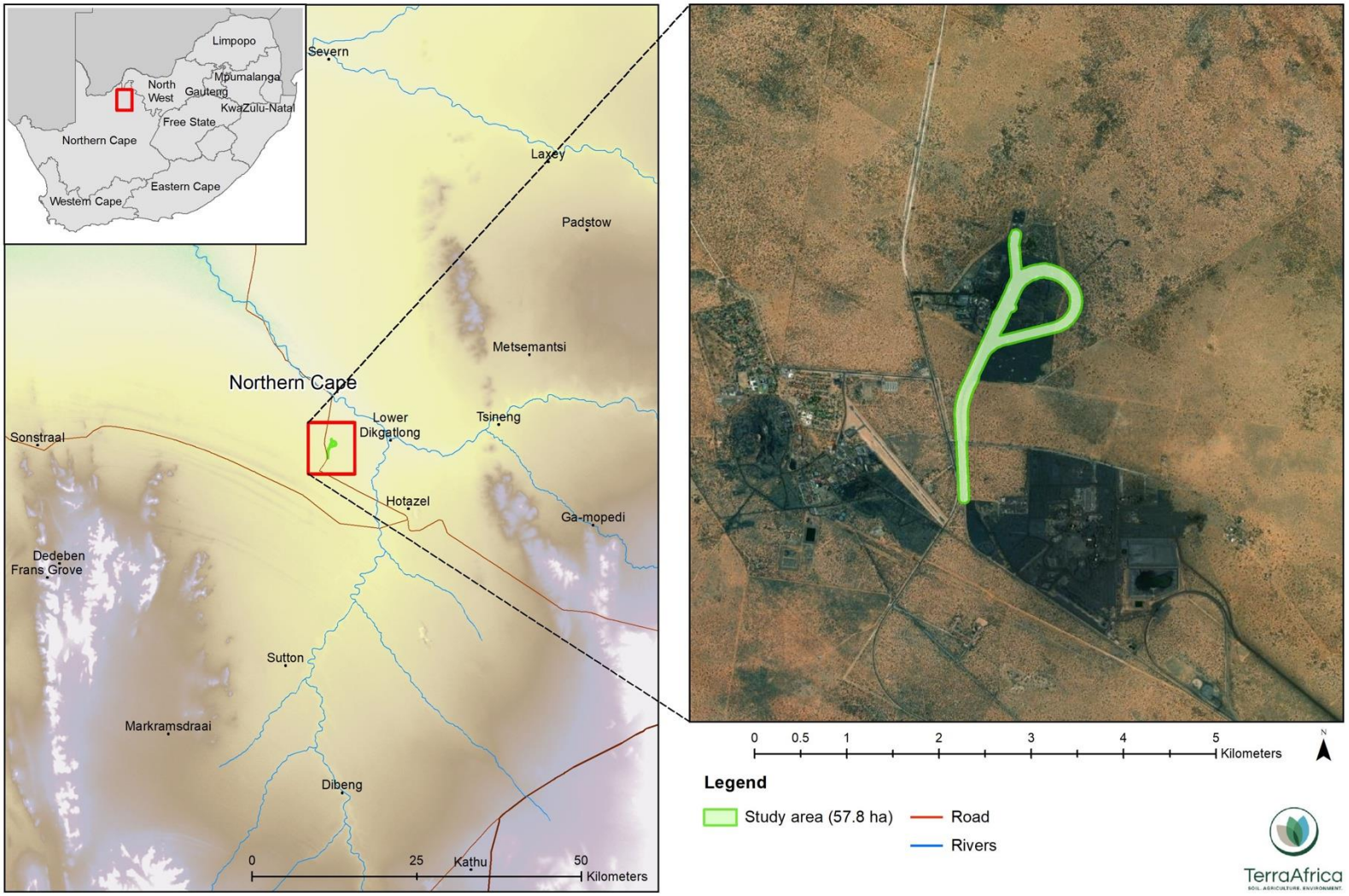


Figure 1 Locality of the study area of the proposed railway extension at Wessels Mine

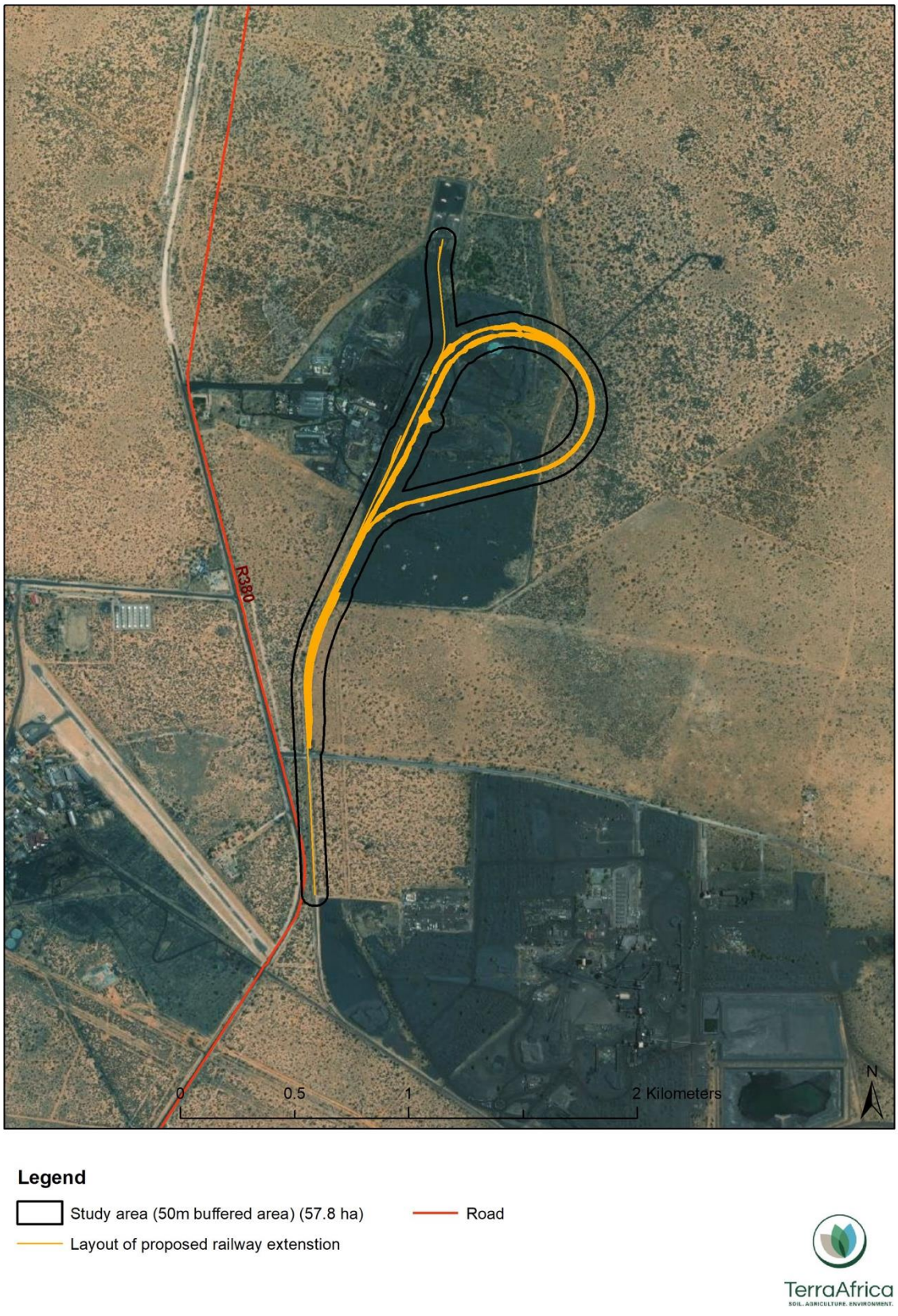


Figure 2 Layout of the proposed new railway extension within the study area at Wessels Mine

3. PURPOSE AND OBJECTIVES OF THE ASSESSMENT

The overarching purpose of the Soil and Agricultural Compliance Specialist Assessment (from here onwards also referred to as the Soil and Agricultural Assessment) that will be included in the Basic Assessment Report (BAR), is to ensure that the sensitivity of the site to the proposed construction and operation of a railway extension at Wessels mine, is sufficiently considered. Also, that the information provided in this report, enables the Competent Authority to come to a sound conclusion on the impact of the proposed project on the food production potential of the site.

To meet this objective, site sensitivity verification must be conducted of which the results must meet the following objectives:

- It must confirm or dispute the current land use and the environmental sensitivity as was indicated by the National Environmental Screening Tool.
- It must contain proof in the form of photographs of the current land use and environmental sensitivity pertaining to the study field.
- All data and conclusions are submitted together with the BAR [prepared in accordance with the National Environmental Management Act, 1998 (107 of 1998) (NEMA)] for the proposed railway extension project.

According to Government Notice (GN)320, the agricultural compliance statement that is submitted must meet the following requirements:

- It must be applicable to the preferred site and the proposed development footprint.
- It has to confirm that the site is of “low” or “medium” sensitivity for agriculture.
- It has to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site.

4. LEGISLATIVE FRAMEWORK FOR THE ASSESSMENT

The report follows the protocols as stipulated for the Agricultural Assessment in GN320 of 2020 (GN320). This Notice provides the procedures and minimum criteria for reporting in terms of Sections 24(5)(a) and (h) and 44 of the NEMA. It replaces the previous requirements of Appendix 6 of the EIA Regulations of NEMA. Table 1 details the relevant sections of the report where the GN320 requirements have been addressed.

Table 1 Summary of report references of the GN320 requirements

GNR 320 requirements of an Agricultural Compliance Statement (Low to Medium Sensitivity)	Reference in this report
3.1. The compliance statement must be prepared by a soil scientist or agricultural specialist registered with the SACNASP.	Page i Appendix 2
3.2. The compliance statement must: 3.2.1. be applicable to the preferred site and proposed development footprint;	Sections 2, 9 and 10
3.2.2. confirm that the site is of "low" or "medium" sensitivity for agriculture; and	Section 9.3

3.2.3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site.	Section 12
3.3. The compliance statement must contain, as a minimum, the following information: 3.3.1. contact details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the assessment including a curriculum vitae;	Page i and Appendix 2
3.3.2. a signed statement of independence;	Page i
3.3.3. a map showing the proposed development footprint (including supporting infrastructure) with a 50m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool;	Figure 3 Section 8
3.3.4. confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimise fragmentation and disturbance of agricultural activities;	Section 11
3.3.5. a substantiated statement from the soil scientist or agricultural specialist on the acceptability, or not, of the proposed development and a recommendation on the approval, or not, of the proposed development;	Section 12
3.3.6. any conditions to which the statement is subjected;	Section 13
3.3.7. in the case of a linear activity, confirmation from the agricultural specialist or soil scientist, that in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase;	N/A – not a linear activity
3.3.8. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr; and	Section 12
3.3.9. a description of the assumptions made as well as any uncertainties or gaps in knowledge or data.	Section 6
3.4. A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	This report forms part of the BA process reports for authorisation

In addition to the specific requirements for this study, the following South African legislation is also considered applicable to the interpretation of the data and conclusions made with regards to environmental sensitivity:

- The Conservation of Agricultural Resources (Act 43 of 1983) states that the degradation of the agricultural potential of soil is illegal. This Act requires the protection of land against soil erosion and the prevention of water logging and salinisation of soils by means of suitable soil conservation works to be constructed and maintained. The utilisation of marshes, water sponges and watercourses are also addressed.
- Section 3(a) of the Subdivision of Agricultural Land Act 70 of 1970 states that agricultural land must not be subdivided. Although the purpose of EA process is not for the subdivision of agricultural land, it will change the current land use from low density livestock production to infrastructure development in support of mining for the duration of the Life of Mine of Wessels Mine.

5. TERMS OF REFERENCE

In addition to the requirements stipulated in GN320, the following Terms of Reference as stipulated by SLR applies to this report:

- Conduct a site visit to verify the soil properties of the area where the proposed railway extension will be located, inclusive of 50 m buffered area.
- Identify and assess potential impacts on both agricultural potential as well as soil, resulting from the proposed project.
- Identify and describe potential cumulative soil, agricultural potential and land capability impacts resulting from the proposed development in relation to proposed and existing developments in the surrounding area.
- Recommend mitigation and management measures to reduce the anticipated impacts on the soil and agricultural properties of the area.

6. ASSUMPTIONS, UNCERTAINTIES AND KNOWLEDGE GAPS

The following assumptions were made during the assessment and reporting phases:

- The assessment of the anticipated impacts assumes that the proposed surface footprint of the project will stay within the confines as depicted in the layout maps in this report.
- It was assumed that the layout will consist of the components stipulated in the final project layout and description that was provided by the applicant.
- Assumptions regarding the impacts of the proposed railway extension were made and based on the author's knowledge of the nature and extent of the planned infrastructure.

7. METHODOLOGY

7.1. Desktop analysis of satellite imagery and other spatial data

The most recent aerial photography of the area available from Google Earth was obtained. The satellite imagery was analysed to determine areas of existing impact and land uses within the study area as well as the larger landscape. Prior to the site visit, a number of geo-referenced data sets were analysed to understand what the likely baseline properties of the proposed study area and surrounding area will be. The data sets that were analysed are:

- The National Land Capability Evaluation Raster Data Layer was obtained from the Department of Agriculture, Land Reform and Rural Development (DALRRD) to determine the land capability classes of the area. The data was developed using a spatial evaluation modelling approach (DALRRD, 2017).
- The long-term grazing capacity for South Africa 2018 was analysed for the proposed railway extension study area and surrounding area. This data set includes incorporation of the RSA grazing capacity map of 1993, the Vegetation type of SA 2006 (as published by Mucina L. & Rutherford M.C.), the Land Types of South Africa

data set as well as the KZN Bioresource classification data. The values indicated for the different areas represent long term grazing capacity with the understanding that the veld is in a relatively good condition.

- The Northern Cape Field Crop Boundaries (November 2019) were analysed to determine whether any crop production areas are present within the proposed railway extension area. The crop production areas may include rainfed annual crops, non-pivot and pivot irrigated annual crops, horticulture, viticulture, old fields, small holdings and subsistence farming.
- Land type data for the project assessment zone was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC) (Land Type Survey Staff, 1972 – 2006). The land type data is presented at a scale of 1:250 000 and entails the division of land into land types, typical terrain cross sections for the land type and the presentation of dominant soil types for each of the identified terrain units.

7.2. Site survey

The site survey was conducted on 10 August 2021. The area that was assessed includes the area of the proposed railway extension infrastructure as well as a 50 m buffered area around the infrastructure. The total area assessed is 57.8 ha and are from here onwards referred to as the study area.

For the soil classification, a hand-held bucket soil auger was used to observe soil profiles to a depth of 1.5 m. Observations were made regarding soil form, texture, structure, nature and depth of underlying material as well as any signs of existing soil degradation. A cold 10% hydrochloric acid solution was used on site to test for the presence of carbonates in the soil. The soils are described according to the soil the Soil Classification Working Group of 2018's *Soil Classification: A Natural and Anthropogenic System for South Africa*. For soil mapping of the areas assessed in detail, the soils were grouped into classes with relatively similar soil characteristics.

Other observations included the agricultural activities in the area, the quality of the natural vegetation that support the livestock farming in the area and the presence of existing farming infrastructure that may be affected by the proposed project.

7.3. Land capability

Once the soil classification survey was completed, the different soil form units were grouped together as the different land capability classes that are present on site. The land capability classes were determined using the guidelines outlined in Section 7 of "The Chamber of Mines Handbook of Guidelines for Environmental Protection (Volume 3, 1981)". The Chamber of Mines pre-mining land capability system differs from the DALRRD system (described in Section 7.1 above) in that it classifies the capability of land only into four major classes that includes wetland land capability but ignores different grades of suitability for agricultural production.

Table 2 indicates the set of criteria as stipulated by the Chamber of Mines to group soil forms into different Land capability classes.

Table 2: Summary of land capability classification criteria as per the Chamber of Mines Guidelines

Criteria for Wetland	➢ Land with organic soils or ➢ A horizon that is gleyed throughout more than 50 % of its volume and is significantly thick, occurring within 750 mm of the surface.
Criteria for Arable Land	➢ Land, which does not qualify as a wetland, ➢ The soil is readily permeable to the roots of common cultivated plants to a depth of 750 mm, ➢ The soil has a pH value of between 4,0 and 8.4, ➢ The soil has a low salinity and SAR, ➢ The soil has a permeability of at least 1,5-mm per hour in the upper 500-mm of soil ➢ The soil has less than 10 % (by volume) rocks or pedocrete fragments larger than 100-mm in diameter in the upper 750-mm, ➢ Has a slope (in %) and erodibility factor (K) such that their product is <2.0, ➢ Occurs under a climatic regime, which facilitates crop yields that are at least equal to the current national average for these crops or is currently being irrigated successfully.
Criteria for Grazing Land	➢ Land, which does not qualify as wetland or arable land, ➢ Has soil, or soil-like material, permeable to roots of native plants, that is more than 250-mm thick and contains less than 50 % by volume of rocks or pedocrete fragments larger than 100-mm, ➢ Supports, or is capable of supporting, a stand of native or introduced grass species, or other forage plants, utilizable by domesticated livestock or game animals on a commercial basis.
Criteria for Wilderness Land	➢ Land, which does not qualify as wetland, arable land or grazing land.

7.4. Impact assessment methodology

Below are the tables with the steps followed to do the impact rating according to the methodology prescribed by SLR.

PART A: DEFINITIONS AND CRITERIA*		
Definition of SIGNIFICANCE		**Significance = consequence x probability**
Definition of CONSEQUENCE		**Consequence is a function of intensity, spatial extent and duration**
Criteria for ranking of the INTENSITY of environmental impacts	**VH**	Severe change, disturbance or degradation. Associated with severe consequences. May result in severe illness, injury or death. Targets, limits and thresholds of concern continually exceeded. Substantial intervention will be required. Vigorous/widespread community mobilization against project can be expected. May result in legal action if impact occurs.
	H	Prominent change, disturbance or degradation. Associated with real and substantial consequences. May result in illness or injury. Targets, limits and thresholds of concern regularly exceeded. Will definitely require intervention. Threats of community action. Regular complaints can be expected when the impact takes place.
	M	Moderate change, disturbance or discomfort. Associated with real but not substantial consequences. Targets, limits and thresholds of concern may occasionally be exceeded. Likely to require some intervention. Occasional complaints can be expected.

	L	Minor (Slight) change, disturbance or nuisance. Associated with minor consequences or deterioration. Targets, limits and thresholds of concern rarely exceeded. Require only minor interventions or clean-up actions. Sporadic complaints could be expected.
	VL	Negligible change, disturbance or nuisance. Associated with very minor consequences or deterioration. Targets, limits and thresholds of concern never exceeded. No interventions or clean-up actions required. No complaints anticipated.
	VL+	Negligible change or improvement. Almost no benefits. Change not measurable/will remain in the current range.
	L+	Minor change or improvement. Minor benefits. Change not measurable/will remain in the current range. Few people will experience benefits.
	M+	Moderate change or improvement. Real but not substantial benefits. Will be within or marginally better than the current conditions. Small number of people will experience benefits.
	H+	Prominent change or improvement. Real and substantial benefits. Will be better than current conditions. Many people will experience benefits. General community support.
	VH+	Substantial, large-scale change or improvement. Considerable and widespread benefit. Will be much better than the current conditions. Favourable publicity and/or widespread support expected.
Criteria for ranking the DURATION of impacts	**VL**	Very short, always less than a year. Quickly reversible
	L	Short-term, occurs for more than 1 but less than 5 years. Reversible over time.
	M	Medium-term, 5 to 10 years.
	H	Long term, between 10 and 20 years. (Likely to cease at the end of the operational life of the activity)
	VH	Very long, permanent, +20 years (Irreversible. Beyond closure)
Criteria for ranking the EXTENT of impacts	**VL**	A part of the site/property.
	L	Whole site.
	M	Beyond the site boundary, affecting immediate neighbours
	H	Local area, extending far beyond site boundary.
	VH	Regional/National

PART B: DETERMINING CONSEQUENCE							
			EXTENT				
			A part of the site/property	Whole site	Beyond the site, affecting neighbours	Local area, extending far beyond site.	Regional/ National
			VL	**L**	**M**	**H**	**VH**
INTENSITY = VL							
DURATION	Very long	**VH**	**Low**	**Low**	**Medium**	**Medium**	**High**
	Long term	**H**	**Low**	**Low**	**Low**	**Medium**	**Medium**
	Medium term	**M**	**Very Low**	**Low**	**Low**	**Low**	**Medium**
	Short term	**L**	**Very low**	**Very Low**	**Low**	**Low**	**Low**
	Very short	**VL**	**Very low**	**Very Low**	**Very Low**	**Low**	**Low**
INTENSITY = L							
DURATION	Very long	**VH**	**Medium**	**Medium**	**Medium**	**High**	**High**
	Long term	**H**	**Low**	**Medium**	**Medium**	**Medium**	**High**

	Medium term	M	Low	Low	Medium	Medium	Medium
	Short term	L	Low	Low	Low	Medium	Medium
	Very short	VL	Very low	Low	Low	Low	Medium

INTENSITY = M

DURATION	Very long	VH	Medium	High	High	High	Very High
	Long term	H	Medium	Medium	Medium	High	High
	Medium term	M	Medium	Medium	Medium	High	High
	Short term	L	Low	Medium	Medium	Medium	High
	Very short	VL	Low	Low	Low	Medium	Medium

INTENSITY = H

DURATION	Very long	VH	High	High	High	Very High	Very High
	Long term	H	Medium	High	High	High	Very High
	Medium term	M	Medium	Medium	High	High	High
	Short term	L	Medium	Medium	Medium	High	High
	Very short	VL	Low	Medium	Medium	Medium	High

INTENSITY = VH

DURATION	Very long	VH	High	High	Very High	Very High	Very High
	Long term	H	High	High	High	Very High	Very High
	Medium term	M	Medium	High	High	High	Very High
	Short term	L	Medium	Medium	High	High	High
	Very short	VL	Low	Medium	Medium	High	High

PART C: DETERMINING SIGNIFICANCE							
PROBABILITY (of exposure to impacts)	Definite/ Continuous	VH	Very Low	Low	Medium	High	Very High
	Probable	H	Very Low	Low	Medium	High	Very High
	Possible/ frequent	M	Very Low	Very Low	Low	Medium	High
	Conceivable	L	Insignificant	Very Low	Low	Medium	High
	Unlikely/ improbable	VL	Insignificant	Insignificant	Very Low	Low	Medium
			VL	L	M	H	VVH
			CONSEQUENCE				

PART D: INTERPRETATION OF SIGNIFICANCE	
Significance	**Decision guideline**
Very High	Potential fatal flaw unless mitigated to lower significance.
High	It must have an influence on the decision. Substantial mitigation will be required.
Medium	It should have an influence on the decision. Mitigation will be required.
Low	Unlikely that it will have a real influence on the decision. Limited mitigation is likely to be required.
Very Low	It will not have an influence on the decision. Does not require any mitigation
Insignificant	Inconsequential, not requiring any consideration.

8. RESULTS OF DESKTOP ANALYSIS

8.1 Land type classification

The entire study area as well as the surrounding area are classified as one land type i.e., Land Type Ah5 (see Figure 3). The mapping unit Ah indicates that more than 10% of this land type consists of red and yellow-brown apedal soils, respectively.

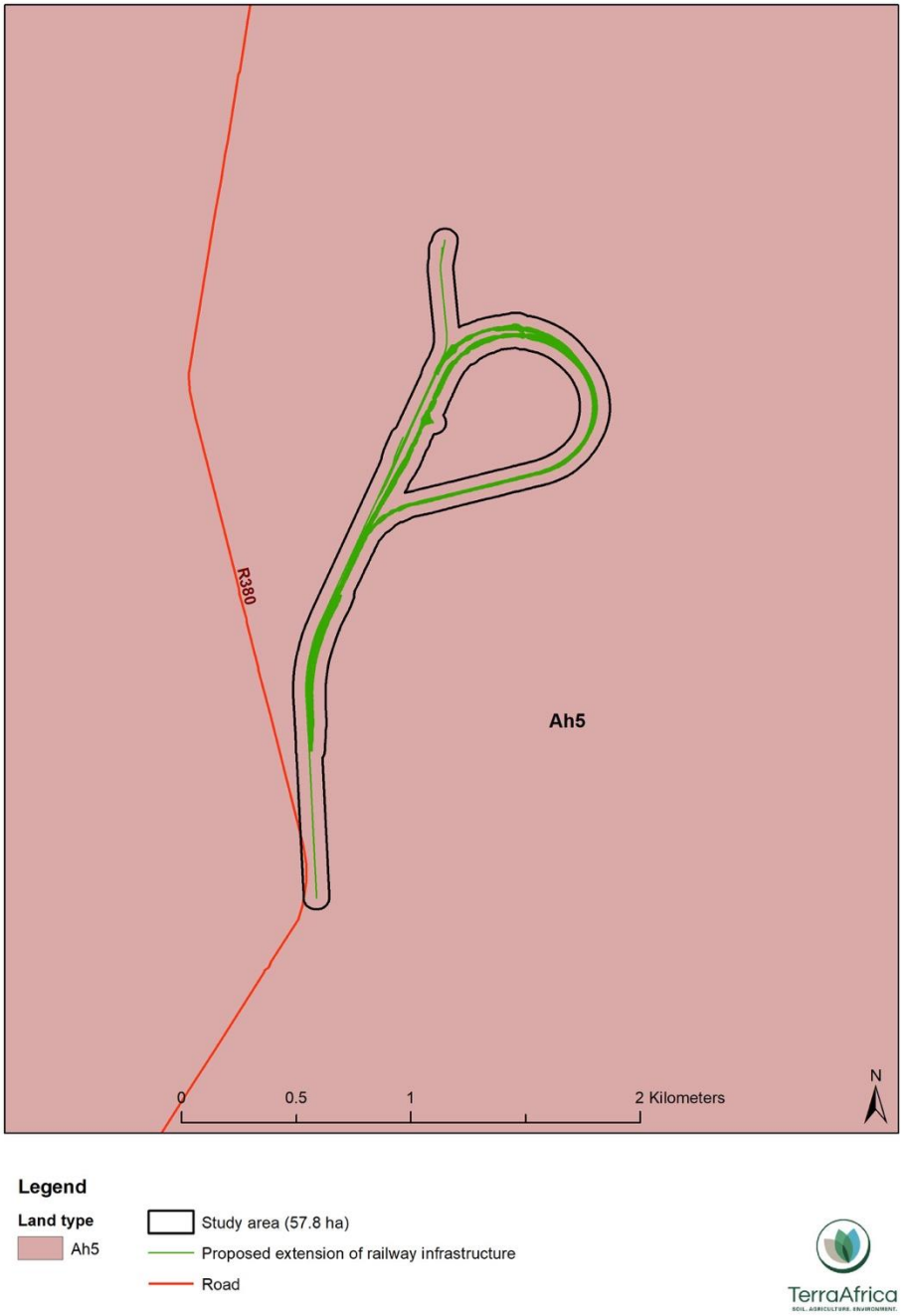


Figure 3 Land type map of the study area and surrounding area

According to the land type data sheet, the terrain of Land Type Ah5 consists of two terrain units (Figure 4). The flat toe-slope positions (Terrain unit 4) have slope of 0 to 1% and is present in approximately 95% of the total surface area covered by this land type. The remaining 5% consist of valley bottom positions (Terrain unit 5) with slope that ranges between 1 and 3%. The toe-slopes consist of around 98% deep soil profiles of the Clovelly and Hutton forms and the remaining 2% of shallow profiles of the Mispah form as well as endorheic pans. The valley bottoms consist of a mixture of shallow profiles of the Mispah form as well as albic profiles of the Fernwood form and endorheic pans. The complete data sheet of this land type is attached as Appendix 1.

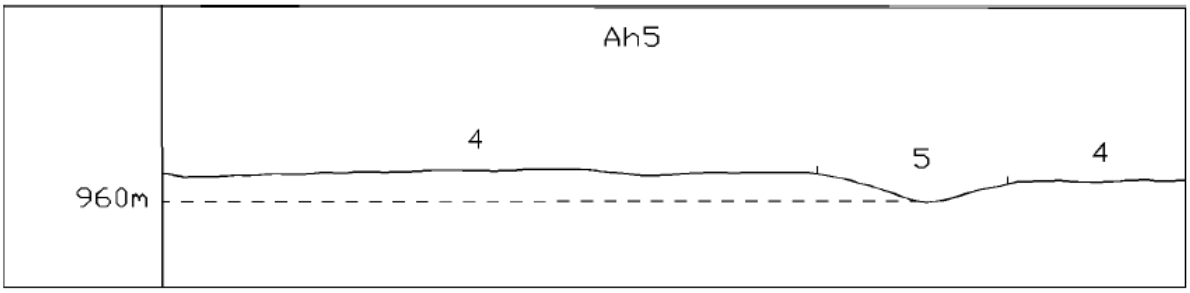


Figure 4 Terrain form sketch of Figure Ah5

8.2. Land capability

The boundary of the proposed railway extension study area of the was superimposed on the land capability raster data layer that DALRRD published in 2017 (Figure 4). The data set is used as one part of the criteria for determination of agricultural sensitivity by the Environmental Screening Tool.

According to this data, land at and around the proposed railway infrastructure consists mainly of land with Low (Class 05) land capability. Two areas with Low-Very low (Class 04) land capability are shown within the study area. Outside of the study area, land predominantly consists of Low (Class 05) land capability interspersed with small areas of slightly higher land capability (Low-Moderate or Class 06) and slightly lower land capability (Low-Very low or Class 04). All the land capability classes identified within the project area indicate that from an agricultural perspective, the land is not considered suitable for arable agriculture but can be used for livestock grazing.

8.3. Field crop boundaries

The field crop boundaries data layers of the Northern Cape Province (DALRRD, 2019), were depicted within and around the proposed railway extension area (

Figure *6*). The data indicates that no crop fields are present within this area. The nearest crop field is about 12 km south-west of the area. Other crop fields are located 20 km south-east and 35 km north. According to DALRRD (2019), these crop fields consist of either rainfed crops or planted pasture. These crop fields occur as isolated fields scattered over a very large area and not in a cluster (that is indicative of farms where crop production is a major part of production).

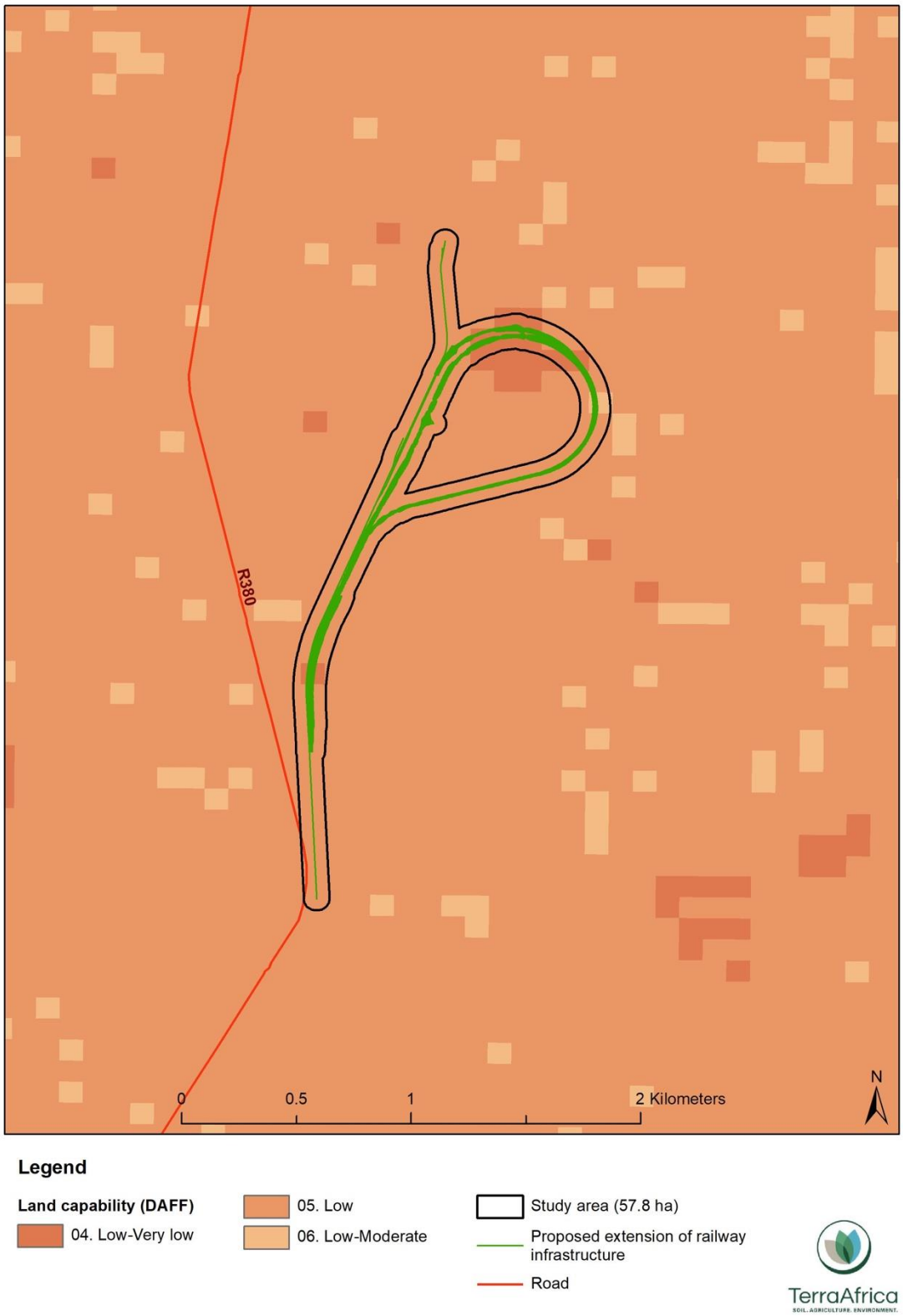


Figure 5 Land capability of the study area and the surrounding area (data source: DALRRD, 2016)

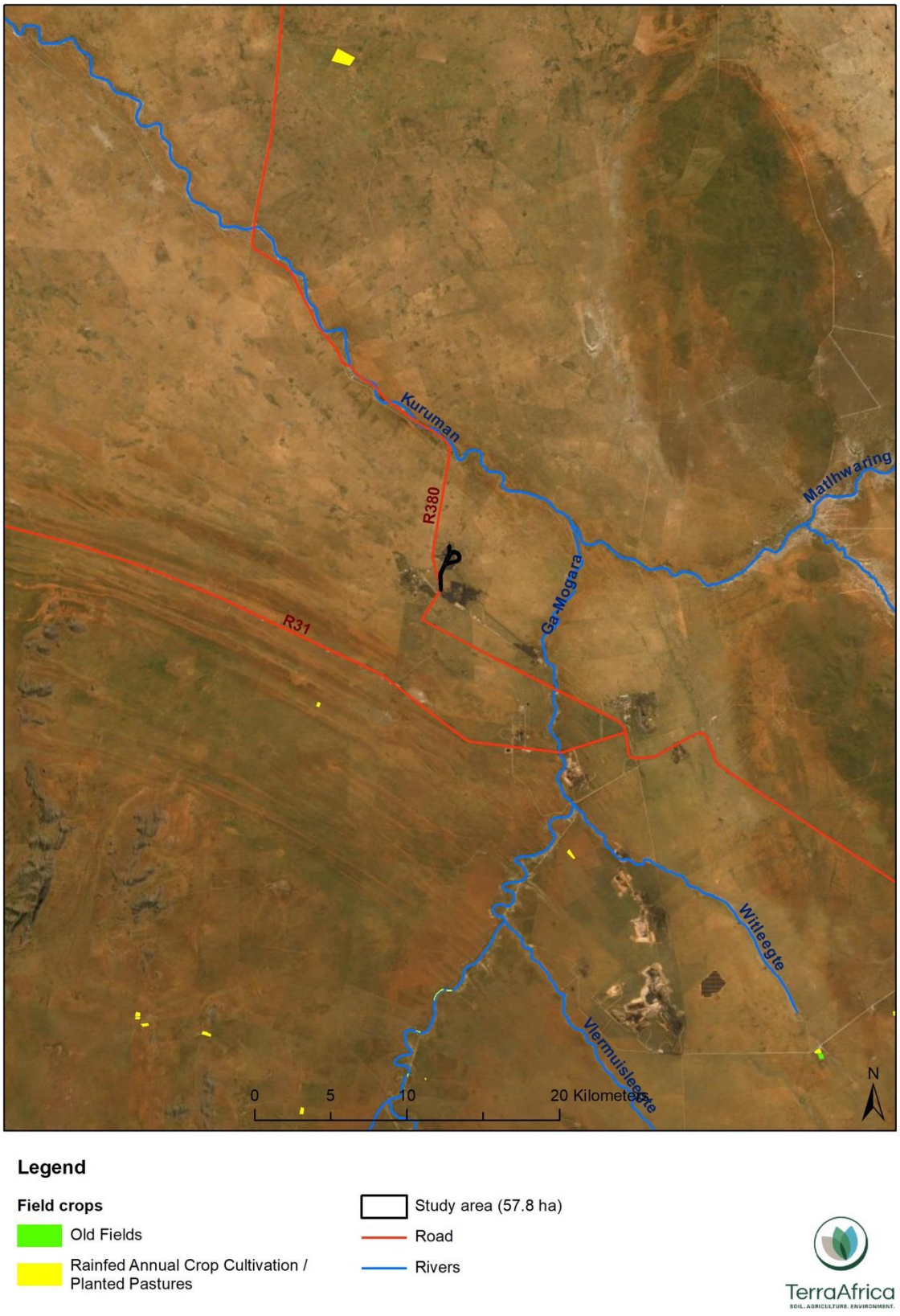


Figure 6 Field crop boundaries within study area as well as the surrounding area (data source: DALRRD, 2019)

9. RESULTS OF SITE ASSESSMENT

9.1. Soil classification

The study area consists of two different soil forms. The positions of these soil forms within the study area, are indicated in ***Error! Reference source not found.***.

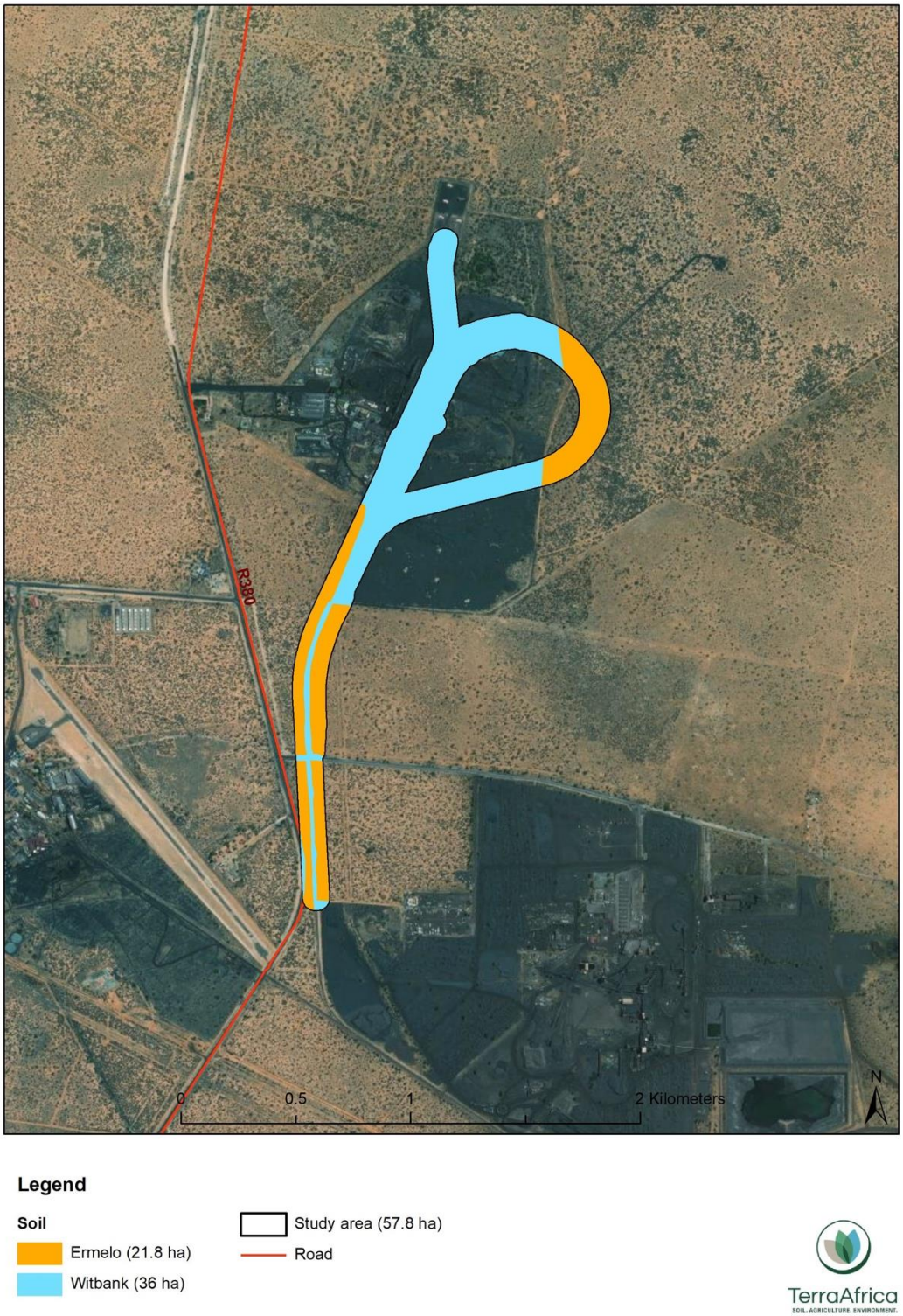


Figure 7 Soil classification map of the proposed railway extension study area

Ermelo form:

Approximately 21.8 ha of the study area consists of the Ermelo soil form. The Ermelo soil form consists of bleached to slightly chromic sandy topsoil that is underlain by yellow-brown apedal subsoil that is deeper than 1.5 m. The soil is structureless (apedal) and well-drained. The soil form currently supports the natural vegetation of the area and has grazing land capability. According to the project infrastructure layout, the Ermelo form will be affected by the eastern part of the balloon section of the railway extension. Narrow strips of Ermelo soils alongside the Witbank soils in the southern section of the railway extension, will also be part of the development footprint.

Figure 8 Example of the yellow colour of the apedal subsoil (in the middle) that was placed on the surface where the bleached colours of the topsoil can be seen (bottom and top of photo)

Witbank class:

The Witbank soil class falls in the group of Anthropogenic Materials as described in Soil Classification: A Natural and Anthropogenic System for South Africa (Soil Classification Working Group, 2018). The Witbank class represents Transported Technosols that are soils that were previously natural soils, as well as anthropogenic materials, that are now covering a mixture of natural soils, anthropogenic materials and excavated areas. Within the study area, the Witbank soils are presented at 36 ha. It includes a section in the northern part of the railway extension that is currently a fenced-off yard where stockpiles of waste rock are present (Figure *9*).

The remaining area of Witbank soils are present in narrow vertical strips that runs from the area described above, to the southern boundary of the study area. These areas consist of access roads where materials were deposited on the sand surface to increase the stability of the road. The surface now consists of a mixture of natural soils and the added materials.

Figure 9 Small stockpiles of waste rock that are part of the Witbank soils of the study area

9.2. Land capability classification

Following the results of the soil classification survey, as well as other site assessment observations such as the terrain and climate, the entire study area can be divided into two land capability classes i.e., 21.8 ha of grazing land capability and 36 ha of wilderness land capability (see Figure 10). The current position of these land capability classes is depicted in Figure 10. The Ermelo soils with its deep, sandy profiles could have had arable land capability and could also be suitable for irrigated crop production. Due to unfavourable climatic conditions and lack of irrigation water and infrastructure, the land capability of these parts of the study area is that of extensive grazing.

The wilderness land capability classification has been assigned to the areas where the Witbank soils are present. The vegetation in these areas is sparse or absent, depending on the thickness of the materials that cover the soil surface and the frequency of traffic in these areas. In areas where waste rock stockpiles have remained for several months to years, some vegetation has established itself along the sides (refer to Figure 9). However, the existing levels of disturbance of these areas, has converted the areas into soils with Wilderness land capability.

Figure 10 Land capability map of the study area according to the Chamber of Mines Classification System

10.5 Land use

The land use of the study area is a mixture of mining (where the supporting infrastructure of the Wessels Mine has been established) and extensive grazing for livestock and wildlife. Stock and/or game farming will be a viable post mining land use of the study area as long as the field quality is maintained by never exceeding the grazing capacity. Tracks of both cattle and livestock were seen during the site visit. The vegetation of the study area that is growing in the Ermelo soils, is sparse in some areas and in these areas bush encroachment was observed. In other areas, patches with thicker grass growth, were observed (Figure 11). Unsurfaced roads connect the mining infrastructure to the natural areas outside the boundary fence.

Figure 11 Patches where thicker grass growth limits bush encroachment

The land uses surrounding the proposed project is a combination of farming activities (livestock and game farming), mining activities (at Black Rock, Hotazel and Kathu), residential areas (Kuruman, Hotazel, Black Rock and Kathu as well as informal settlements and farmsteads), commercial and recreational activities in the above-mentioned towns and transport services (R380 provincial road and D3340 private gravel road).

10.6 Agricultural potential

From a soil physical and chemical perspective, the Ermelo soils within the study area may have been highly suitable for both dryland and irrigated crop production. However, the study area receives an average of 460 mm of rain annually, the soils are very well-drained and the

evaporation rate is high because of high temperatures, commercial crop production would be at high risk of suffering losses as a result of droughts. The study area does not have any current irrigation infrastructure that was being used for irrigation purposes. No large dams with irrigation potential have been observed in the study area. Although the establishment of irrigation infrastructure requires high initial capital investment, the site has potential for this production method should it ever become a future land use possibility.

Following the site visit it can be confirmed that the area where natural soils are present within the study area, is suitable for extensive livestock farming. It is currently used for livestock farming and a watering trough on a cement platform, was observed.

Figure 12 Watering trough observed during the site visit

The spatial data layer of the long-term grazing capacity of the area (DALRRD, 2018), was used to determine the number of cattle that can graze in the areas with grazing land capability, within the study area. The ideal grazing capacity of a specified area is an indication of the long-term production potential of the vegetation layer growing there to maintain an animal with an average weight of 450 kg (defined as 1 Large Stock Unit (LSU)) with an average feed intake of 10 kg dry mass per day over the period of approximately a year. According to the metadata layer obtained from DALRRD, the average long-term grazing capacity of the entire study area, is 13ha/LSU (Figure 13). When using this grazing capacity, the areas with grazing land capability (21.8 ha), can provide feed for 2 head of cattle and this will be lost from the area if the proposed railway extension project at Wessels Mine, is authorised.

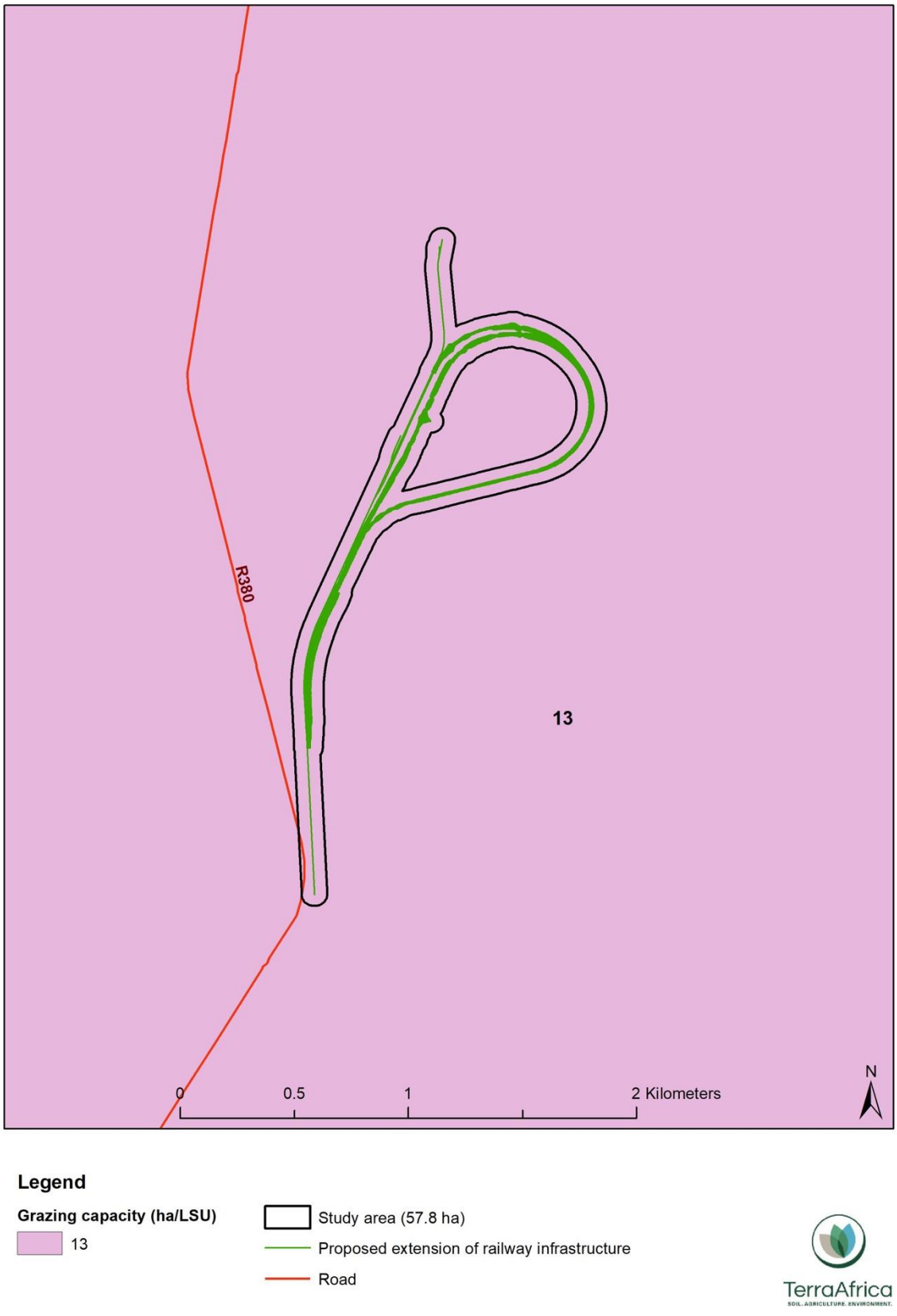


Figure 13 Long-term grazing capacity of the proposed railway extension area and surrounding area (data source: DALRRD, 2018)

10. SITE SENSITIVITY TO THE PROPOSED DEVELOPMENT

The combined Agricultural Sensitivity of the area considered for the proposed railway extension project, was determined by using the National Environmental Screening Tool (www.screening.environment.gov.za). The Agricultural Theme of the screening tool considers a combination of the national land capability raster data, as well as the field crop boundaries as compiled by the DALRRD (DALRRD 2016, DALRRD 2019).

The screening report was generated by SLR on 13 April 2021. The requirements of GN320 stipulates that a 50 m buffered area around the development footprint must be assessed with the screening tool. The area that was used include a larger block of land around the proposed railway extension that includes a buffer area of between 50 and 100 m. The results provided by the screening tool indicated that the site mostly has Low sensitivity to the proposed development except for two small areas in the southern part of the site which have Medium agricultural sensitivity (Figure 14). The entire area assessed is surrounded by land with Low agricultural sensitivity with a few small areas of Medium sensitivity located to the north-east and south-east of the site.

From the results described in Section 9 above, it is confirmed by the specialist that the entire site has Low sensitivity to the proposed development (see Figure 15). While the undisturbed soils of the Ermelo form support natural vegetation of varying suitability for livestock grazing, the entire area evaluated during the assessment, can only provide to 2 head of cattle, following the grazing capacity of the area (13ha/LSU). The largest portion of the study area (36 ha) are already affected by infrastructure areas that support the current mining activities at Wessels Mine and currently do not contribute any forage to a farming system.

11. MICRO-SITING AND CONSIDERATION OF ALTERNATIVE LAYOUTS

The proposed project entails the extension of the existing railway infrastructure and the construction of a railway balloon or turning loop within an existing mining right area. One design alternative, in addition to the preferred alternative, was considered for the proposed project. The alternative railway loop was proposed to be larger than the preferred alternative. This alternative was not considered further for assessment, due to the larger development footprint. It would require a larger area of land to be cleared, which was not considered favourable. It can therefore be confirmed that the layout that was chosen, will minimise the fragmentation of any agricultural activities by remaining close to the existing mining infrastructure footprint. This layout also avoids leaving small fields of grazing veld that will no longer be accessible to livestock.

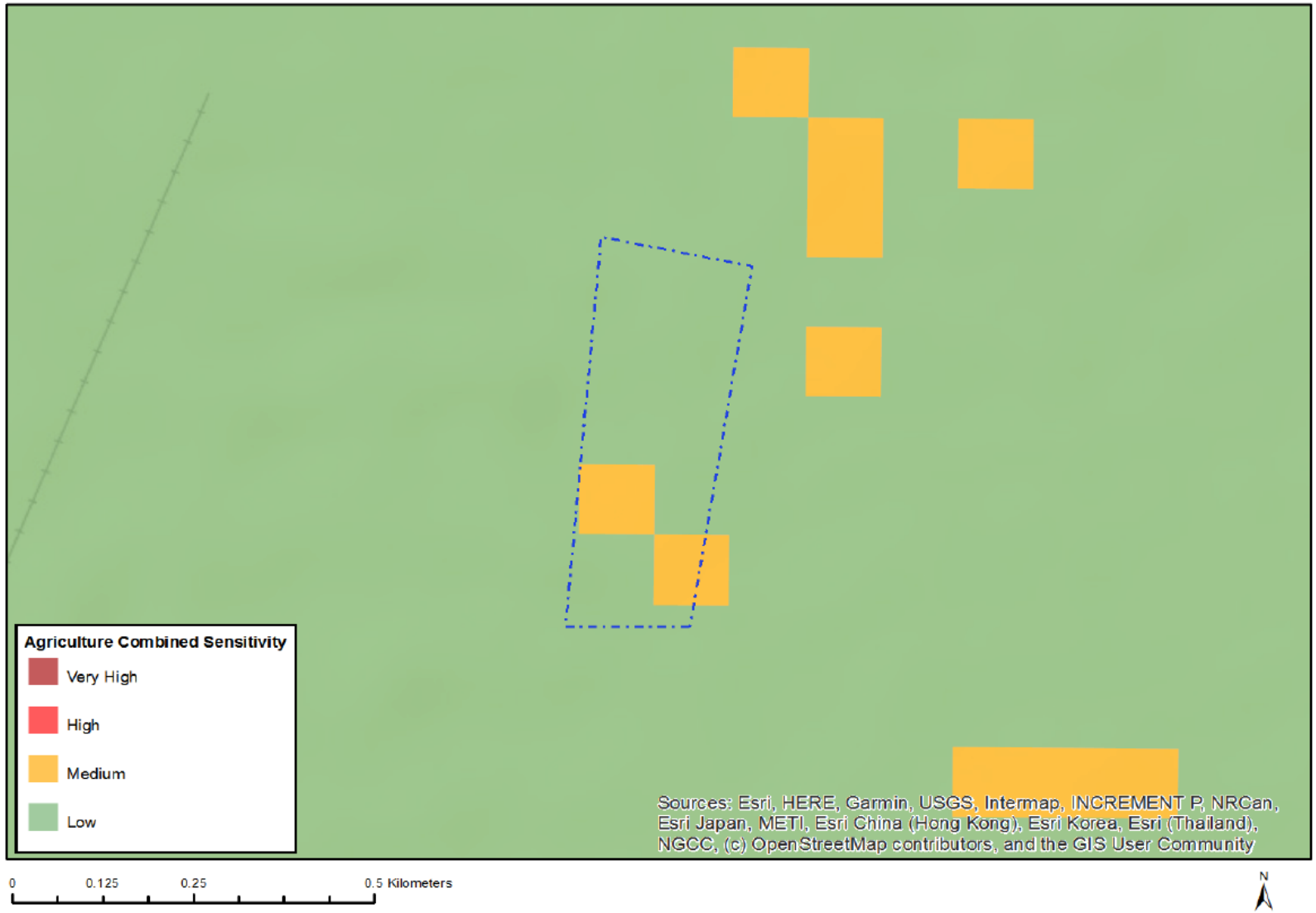


Figure 14 Agricultural Combined Sensitivity of the area where the proposed railway extension will be located (Environmental Screening Tool, DEA)

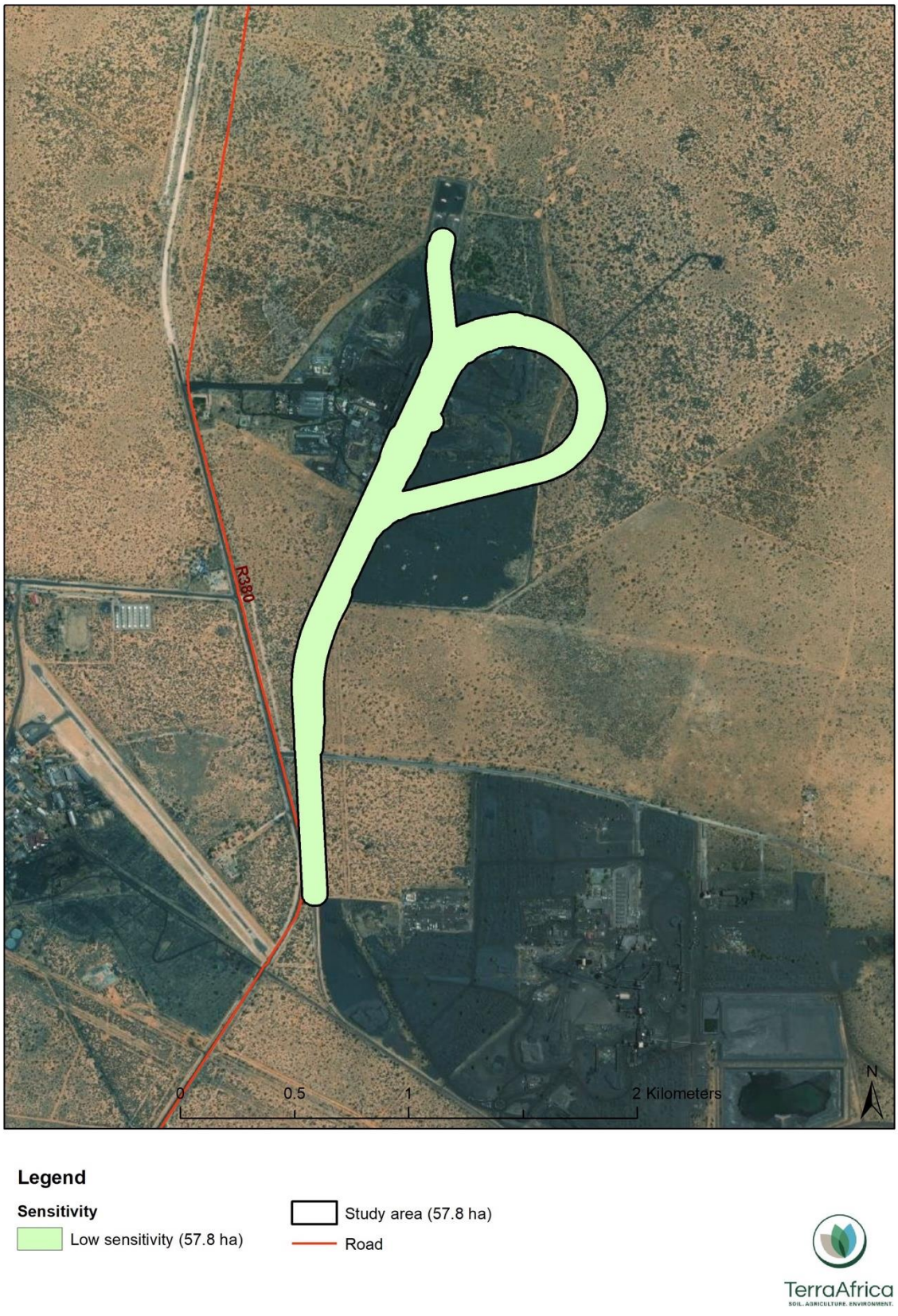


Figure 15 Sensitivity rating of the study area of the proposed railway extension at Wessels Mine

12. IMPACT ASSESSMENT

The extension of the existing railway will require the construction of a new railway balloon that will be approximately 2 500 m long and 25 m wide. It is assumed that the construction phase will involve soil preparation and the transport and delivery of materials to the construction area.

12.1 Construction phase

The only areas where permanent change to land capability will occur is the areas where the railway infrastructure will remain on the surface. In these areas the grazing land capability is permanently lost. This is considered a minor loss, permitting that all the other areas around it is sufficiently rehabilitated back to grazing land. Apart from the minor impact on land capability, there will also be impacts on soil during the construction phase. The impacts are described below together with mitigation measures that will reduce the significance of the impacts.

12.1.1 Soil erosion

Soil erosion will be a measurable deterioration that will occur as a result of vegetation removal from the soil surface This is a permanent impact that will be localised within the site boundary with high consequence and significance that can be mitigated to an impact of medium significance. The rating of the unmitigated and mitigated impact significance, is presented in Table 3.

The following mitigation measures must be implemented to reduce the impact of soil erosion:

- Limit vegetation clearance to only the areas where the surface infrastructure will be constructed.
- Avoid parking of vehicles and equipment outside of designated parking areas.
- Plan vegetation clearance activities for dry seasons (late autumn, winter and early spring).
- Design and implement a Stormwater Management System where run-off from surfaced areas are expected.
- Re-establish vegetation along the railway infrastructure to reduce the impact of run-off from the compacted surface of the railway area.

Table 3 Significance rating of soil erosion before and after the implementation of mitigation measures

Scenario	Intensity	Duration	Extent	Consequence	Significance
Unmitigated	H	H	L	H	H
Mitigated	M	H	VL	M	M

12.1.2 Disturbance of original soil profiles

The disturbance of original soil profiles and horizon sequences of these profiles during earthworks (stripping of topsoil) is a low intensity impact. This impact is long-term but will be localised within the site boundary. This impact will have medium significance that can be mitigated to very low. The rating of the unmitigated and mitigated impact significance, is presented in Table 4.

Implementation of the following mitigation measures will reduce the impact of soil disturbance:

- Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint;
- Unnecessary land clearance must be avoided; and
- Level any remaining topsoil that were removed from the railway area and that remained on the surface instead of allowing small stockpiles of soil to remain on the surface.

Table 4 Significance rating of soil erosion before and after the implementation of mitigation measures

Scenario	Intensity	Duration	Extent	Consequence	Significance
Unmitigated	L	H	L	M	M
Mitigated	L	H	VL	L	VL

12.1.3 Soil chemical pollution

Soil chemical pollution because of potential oil and fuel spillages from vehicles, is considered to be a moderate deterioration of the soil resource. This impact will be localised within the site boundary and will have medium significance on the soil resource when not managed. However, with proper waste management and immediate clean-up as mitigation measures, the significance of this impact can be reduced to very low (post-mitigation).

During the construction phase, soil chemical pollution must be minimised through implementation of the following mitigation measures:

- Losses of fuel and lubricants from the oil sumps and steering racks of vehicles and equipment should be contained using a drip tray with plastic sheeting filled with absorbent material;
- Using biodegradable hydraulic fluids, using lined sumps for collection of hydraulic fluids, recovering contaminated soils and treating them off-site, and securely storing dried waste mud by burying it in a purpose-built containment area;
- Avoiding waste disposal at the site wherever possible, by segregating, trucking out, and recycling waste;
- Containing potentially contaminating fluids and other wastes; and
- Cleaning up areas of spillage of potentially contaminating liquids and solids.

Table 5 Significance rating of soil erosion before and after the implementation of mitigation measures

Scenario	Intensity	Duration	Extent	Consequence	Significance
Unmitigated	L	H	L	M	M
Mitigated	L	H	VL	L	VL

12.2 Other project phases

It is not anticipated that there will be any further impacts on soil and agricultural potential during the operational, decommissioning and closure phases.

13. ACCEPTABILITY STATEMENT

The proposed railway extension project at Wessels Mine falls within a larger area of mining projects intermixed with game and livestock farming and settlement (Hotazel, Black Rock, Kuruman and Kathu). The soil quality of undisturbed land affected by the surface footprint of the proposed project will include soil erosion, soil compaction and soil pollution as well as a loss of the grazing land capability. It is therefore of my opinion that the activity may be an acceptable change to the current land use of the property, should the project be authorised. It follows that best practice regarding soil management must be implemented.

14. REFERENCE LIST

Brady, N.C. and Weil, R.P. 2008. The Nature and Properties of Soils. Revised fourteenth edition., Upper Saddle River, New Jersey: Prentice Hall.

Crop Estimates Consortium, 2019. *Field crop boundary data layer (NC province)*, 2019. Pretoria. Department of Agriculture, Forestry and Fisheries.

Department of Agriculture, Forestry and Fisheries, 2016. *National land capability evaluation raster data: Land capability data layer*, 2016. Pretoria.

Soil Classification Working Group (2018). *Soil Classification: A Natural and Anthropogenic System for South Africa.* ARC-Institute for Soil, Climate and Water. Pretoria

South Africa (Republic) 2018. *Long-term grazing capacity for South Africa*: Data layer. Government Gazette Vol. 638, No. 41870. 31 August 2018. Regulation 10 of the Conservation of Agricultural Resources Act (CARA): Act 43 of 1983. Pretoria. Government Printing Works.

APPENDIX 1 – DATA SHEET OF LAND TYPE AH5

LAND TYPE / *LANDTIPE* ..... : **Ah5**

CLIMATE ZONE / *KLIMAATSONE* ..... : 1S

Area / *Oppervlakte* ..... : 364310 ha

Estimated area unavailable for agriculture

Beraamde oppervlakte onbeskikbaar vir landbou : 6000 ha

Occurrence (maps) and areas / *Voorkoms (kaarte) en oppervlakte :*

2622 Morokweng (305260 ha) 2722 Kuruman (59050 ha)

Inventory by / *Inventaris deur :*

J F Eloff & A T P Bennie

Modal Profiles / *Modale profiele :*

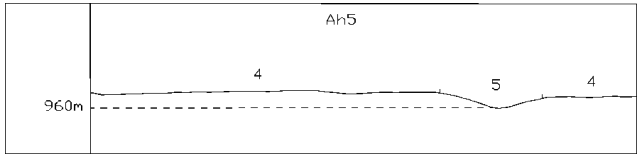
None / Geen

Terrain unit / *Terreineenheid* ..... :	4	5
% of land type / *% van landtipe* ..... :	95	5
Area / *Oppervlakte (ha)* ..... :	346094	18216
Slope / *Helling (%)* ..... :	0 - 1	1 - 3
Slope length / *Hellingslengte (m)* ..... :	1000 - 10000	200 - 1200
Slope shape / *Hellingsvorm* ..... :	Z	Z
MB0, MB1 (ha) ..... :	342634	7286
MB2 - MB4 (ha) ..... :	3461	10929

Soil series or land classes *Grondseries of landklasse*	**Depth** *Diepte* (mm)	MB	:	ha	%	ha	%	**Total** *Totaal* ha	%	**Clay content %** *Klei-inhoud %* A	E	B21	Hor	**Texture** *Tekstuur* Class / *Klas*	**Depth limiting material** *Diepte-beperkende materiaal*
Sunbury Cv30	>1200	0	:	145359	42			145360	39.9	2-4		3-6	B	fiSa	
Mangano Hu33	>1200	0	:	62297	18			62297	17.1	3-6		6-10	B	fiSa	
Annandale Cv33	>1200	0	:	62297	18			62297	17.1	3-6		6-10	B	fiSa	
Roodepoort Hu30, Gaudam Hu31	>1200	0	:	41531	12			41531	11.4	2-4		3-6	B	fi/meSa	
Sandspruit Cv31	>1200	0	:	27688	8			27688	7.6	2-4		3-6	B	meSa	
Mispah Ms10, Kalkbank Ms22	100-250	3	:	3461	1	9108	50	12569	3.5	6-10			A	fiSa	R,ka
Maputa Fw10, Motopi Fw20,			:												
Fernwood Fw11, Langebaan Fw21	>1200	0	:	3461	1	5465	30	8926	2.5	3-6		4-8	B	fi/meSa	
Shorrocks Hu36	>1200	0	:			1822	10	1822	0.5	7-10		15-18	B	fiSaLm	
Pans/Panne		4	:			1822	10	1822	0.5						

Terrain type / *Terreintipe :* A1

Terrain form sketch / *Terreinvormskets*



For an explanation of this table consult LAND TYPE INVENTORY (table of contents)

Ter verduideliking van hierdie tabel kyk LANDTIPE - INVENTARIS (inhoudsopgawe)

Geology: Aeolian sand of Recent age with occasional outcrops of Tertiary Kalahari beds (surface limestone, silcrete and sandstone) in the riverbeds.

Geologie: Eoliese sand van Resente ouderdom met enkele dagsome van Tersiere Kalaharilae (oppervlakkalksteen, silkreet en sandsteen) in die rivierlope.

APPENDIX 2 – CURRICULUM VITAE OF SPECIALIST

+2782-828-3587

mpienaar@terraafrica.co.za

linkedin.com/in/marinepienaar

Wolmaransstad,
South Africa

EXPERTISE

Soil Quality Assessment

Soil Policy and Guidelines

Agricultural Agro-Ecosystem Assessment

Sustainable Agriculture

Data Consolidation

Land Use Planning

Soil Pollution

Hydropedology

EDUCATION

MASTER'S DEGREE
Environmental Science
University of Witwatersrand
2010 – 2018

BACHELOR'S DEGREE
Agricultural Science
University of Pretoria
2001 – 2004

PROFESSIONAL PROFILE

I contribute specialist knowledge on agriculture and soil management to ensure long-term sustainability of projects in Africa. For the past thirteen years, it has been my calling and I have consulted on more than 200 projects. My clients include environmental and engineering companies, mining houses, and project developers. I enjoy the multi-disciplinary nature of the projects that I work on and I am fascinated by the evolving nature of my field of practice. The next section provide examples of the range of projects completed. A comprehensive project list is available on request.

PROJECT EXPERIENCE

Global Assessment on Soil Pollution

Food and Agricultural Organisation (FAO) of the United Nations (UN)

Author of the regional assessment of Soil in Sub-Saharan Africa. The report is due for release in February 2021. The different sections included:

- Analysis of soil and soil-related policies and guidelines for each of the 48 regional countries
- Description of the major sources of soil pollution in the region
- The extent of soil pollution in the region and as well as the nature and extent of soil monitoring
- Case study discussions of the impacts of soil pollution on human and environmental health in the region
- Recommendations and guidelines for policy development and capacitation to address soil pollution in Sub-Saharan Africa

Data Consolidation and Amendment

Range of projects: Mining Projects, Renewal Energy

These projects included developments where previous agricultural and soil studies are available that are not aligned with the current legal and international best practice requirements such as the IFC Principles. Other projects are expansion projects or changes in the project infrastructure layout. Tasks on such projects include the incorporation of all relevant data, site verification, updated baseline reporting and alignment of management and monitoring measures.

Project examples:

- Northam Platinum's Booysendal Mine, South Africa
- Musonoi Mine, Kolwezi District, Democratic Republic of Congo
- Polihali Reservoir and Associated Infrastructure, Lesotho
- Kaiha 2 Hydropower Project, Liberia
- Aquarius Platinum's Kroondal and Marikana Mines

PROFESSIONAL MEMBERSHIP

South African Council for Natural Scientific Professions (SACNASP)

Soil Science Society of South Africa (SSSSA)

Soil Science Society of America (SSSA)

Network for Industrially Contaminated Land in Africa (NICOLA)

LANGUAGES

English (Fluent)

Afrikaans (Native)

French (Basic)

PRESENTATIONS

There is spinach in my fish pond
TEDx Talk
Available on YouTube

♦

Soil and the Extractive Industries
Session organiser and presenter
Global Soil Week, Berlin (2015)

♦

How to dismantle an atomic bomb
Conference presentation (2014)
Environmental Law Association (SA)

PROJECT EXPERIENCE (Continued)

Agricultural Agro-Ecosystem Assessments

Range of projects: Renewable Energy, Industrial and Residential Developments, Mining, Linear Developments (railways and power lines)

The assessments were conducted as part of the Environmental and Social Impact Assessment processes. The assessment process includes the assessment of soil physical and chemical properties as well as other natural resources that contributes to the land capability of the area.

Project examples:

- Mocuba Solar PV Development, Mozambique
- Italthai Railway between Tete and Quelimane, Mozambique
- Lichtenburg PV Solar Developments, South Africa
- Manica Gold Mine Project, Mozambique
- Khunab Solar PV Developments near Upington, South Africa
- Bomi Hills and Mano River Mines, Liberia
- King City near Sekondi-Takoradi and Appolonia City near Accra, Ghana
- Limpopo-Lipadi Game Reserve, Botswana
- Namoya Gold Mine, Democratic Republic of Congo

Sustainable Agriculture

Range of projects: Policy Development for Financial Institutions, Mine Closure Planning, Agricultural Project and Business Development Planning

Each of the projects completed had a unique scope of works and the methodology was designed to answer the questions. While global indicators of sustainable agriculture are considered, the unique challenges to viable food production in Africa, especially climate change and a lack of infrastructure, in these analyses.

Project examples:

- Measurement of sustainability of agricultural practices of South African farmers – survey design and pilot testing for the LandBank of South Africa
- Analysis of the viability of avocado and mango large-scale farming developments in Angola for McKinsey & Company
- Closure options analysis for the Tshipi Borwa Mine to increase agricultural productivity in the area, consultation to SLR Consulting
- Analysis of risks and opportunities for farm feeds and supplement suppliers of the Southern African livestock and dairy farming industries
- Sustainable agricultural options development for mine closure planning of the Camutue Diamond Mine, Angola

PROFESSIONAL DEVELOPMENT

Contaminated Land Management 101Training
Network for Industrially Contaminated Land in Africa
2020

Intensive Agriculture in Arid & Semi-Arid Environments
CINADCO/MASHAV R&D Course, Israel
2015

World Soils and their Assessment Course
ISRIC – World Soil Information Centre, Netherlands
2015

Wetland Rehabilitation Course
University of Pretoria
2010

Course in Advanced Modelling of Water Flow and Solute Transport in the Vadose Zone with Hydrus
University of Kwazulu-Natal
2010

Environmental Law for Environmental Managers
North-West University Centre for Environmental Management
2009

PROJECT EXPERIENCE (Continued)

Soil Quality Assessments

Range of projects: Rehabilitated Land Audits, Mine Closure Applications, Mineral and Ore Processing Facilities, Human Resettlement Plans

The soil quality assessments included physical and chemical analysis of soil quality parameters to determine the success of land rehabilitation towards productive landscapes. The assessments are also used to understand the suitability for areas for Human Resettlement Plans

Project examples:

- Closure Planning for Yoctolux Colliery
- Soil and vegetation monitoring at Kingston Vale Waste Facility
- Exxaro Belfast Resettlement Action Plan Soil Assessment
- Soil Quality Monitoring of Wastewater Irrigated Areas around Matimba Power Station
- Keaton Vanggatfontein Colliery Bi-Annual Soil Quality Monitoring

REFERENCES

NATALIA RODRIGUEZ EUGENIO
Soil Pollution Specialist
FAO of the UN
+3906-5705-0134
Natalia.rodriguezeugenio@fao.org

VERNON SIEMELINK
Director
Eco Elementum
+2772-196-9928
vernon@ecoe.co.za

JO-ANNE THOMAS
Director
Savannah Environmental
+2711-656-3237
joanne@savannahsa.com

RENEE JANSE VAN RENSBURG
Environmental Manager
CIGroup
+2782-496-9038
reneejvr@cigroup.za.com

Project Reference: 720.19136.00010 File Ref. Wessels Railway Extension_Closure Liability Estimate_30 July 2021

30 July 2021

SLR Consulting (South Africa) Pty Ltd

ATTENTION: Rizqah Baker

CLOSURE LIABILITY CALCULATION FOR THE WESSELS RAILWAY EXTENSISON PROJECT (TO BE INCLUDED IN EIA/EMPR WRITE-UP)

1. CLOSURE LIABILITY

1.1 INTRODUCTION

This closure liability calculation has been prepared as an addendum to the current closure liability estimate for Wessels Mine, incorporating only the infrastructure changes associated with the proposed railway extension project.

1.2 CLOSURE LIABILITY ESTIMATION PROCEDURE

1.2.1 Closure activities

The closure liability was calculated as per the current closure activities identified by Wessels Mine for the existing railway infrastructure on site, namely:

- lift and remove railway channels;
- remove ballast and concrete sleepers, and dispose on discard dump;
- deep rip the compacted footprint area associated with the railway line;
- spread 250 mm topsoil (and apply fertilizer) to ripped railway footprint area;
- revegetate railway footprint area; and
- maintain and monitor revegetated area until vegetation suitably established.

Only the newly disturbed areas associated with the proposed railway extension project were considered for deep ripping, topsoiling, fertilizing, revegetation, maintenance and monitoring. Current disturbed areas (where the proposed railway extension project will traverse) have not been considered for these specific closure activities since they are already included for, and costed, in the current closure liability estimate for Wessels Mine.

Furthermore, the proposed upgrade to the existing line is not expected to influence the current liability estimate for Wessels Mine and has therefore not been included here.

1.2.2 Quantities

The quantities associated with the proposed railway extension were measured off the infrastructure layout provided (see Appendix A).

1.2.3 Unit rates

The unit rates for each closure activity was taken from the current closure liability estimate for Wessels Mine. These unit rates are considered to be independent third party rates, and are applicable as at 1 July 2021.

No allowance for salvage and/or recycling scrap material has been considered in the closure liability estimate.

1.2.4 Time, fee and contingency costs

The time, fee and contingency costs were taken from the current closure liability estimate for Wessels Mine, namely:

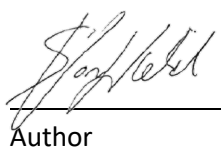
- Preliminary and general, 20 %.
- Contingency, 28 %.

1.3 CLOSURE LIABILITY CALCULATION

The closure liability calculation is provided in Appendix B.

The closure liability for the proposed railway extension project at Wessels Mine is R 2,934,819 (incl. VAT). The liability calculation is at Current Value (CV) as at 1 July 2021.

Yours faithfully



Author

APPENDIX A - PROPOSED RAILWAY EXTENSION LAYOUT

APPENDIX B – CLOSURE LIABILITY CALCULATION

CALCULATION OF CURRENT LIABILITY						
Mine:	**Wessels Mine - Proposed Railway Extension Project**					
Evaluators:	**SLR Consulting (Pty) Ltd**				Date:	**1 July 2021**
No.	**Description:**	**Unit:**	**Operational Area**	**Quantity**	**Master rate**	**Amount (Rands)**
1	Removal of railway channels	m	Railway Extension - South Loop	4592	R 200.49	R 920 650.08
		m	Railway Extension - North Loop	682	R 200.49	R 136 734.18
2	Remove ballast and concrete sleepers, and dispose of on discard dump	m^3	Railway Extension - South Loop	5510	R 47.02	R 259 080.20
		m^3	Railway Extension - North Loop	818	R 47.02	R 38 462.36
3	Rip previously compacted areas	m^2	Newly distrubed area only	13500	R 7.45	R 100 575.00
4	Spread 250mm topsoil	m^3	Newly distrubed area only	3375	R 35.90	R 121 162.50
5	Apply fertilizer	m^2	Newly distrubed area only	13500	R 2.72	R 36 720.00
6	Revegetate disturbed area	m^2	Newly distrubed area only	13500	R 2.82	R 38 070.00
7	Maintenance of revegetated area	ha	Newly distrubed area only	1.35	R 6 311.95	R 8 521.13
8	Monitoring of revegetated area	ha	Newly distrubed area only	1.35	R 1 106.58	R 1 493.88
					Subtotal 1	**R 1 661 469.33**
9	Preliminary and general (P&G's)	20 % of Subtotal 1				R 332 293.87
					Subtotal 2	**R 1 993 763.20**
10	Contingency	28 % of Subtotal 2				R 558 253.70
					Subtotal 3	**R 2 552 016.90**
11	VAT	15 % of Subtotal 3				R 382 802.54
					GRAND TOTAL (Incl. VAT)	**R 2 934 819.44**