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SITE SENSITIVITY VERIFICATION AND AGRICULTURAL COMPLIANCE STATEMENT FOR A MINING PERMIT APPLICATION FOR A DOLERITE QUARRY ON FARM NUMBER RE/155, RHENOSTERKOP NEAR BEAUFORT WEST

Report by
Johann Lanz

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1 INTRODUCTION

Environmental authorisation is being sought for a mining permit for a dolerite quarry on Farm number RE/155, Rhenosterkop near Beaufort West. The locality map of the site is given in Figure 1. In terms of the National Environmental Management Act (Act No 107 of 1998 - NEMA), an application for environmental authorisation requires an agricultural assessment. In this case, based on the verified sensitivity of the site (see Section 6), the level of agricultural assessment required is an Agricultural Compliance Statement.

Johann Lanz was appointed as an independent agricultural specialist to conduct the agricultural assessment. The objective and focus of an agricultural assessment is to assess whether or not the agricultural impact of the proposed development will be acceptable, and based on this, to make a recommendation on whether or not it should be approved.

Figure 1. *Locality map of the proposed mine north-east of Beaufort West. Proposed mine (orange outline); farm boundary (red outline).*

The purpose of the agricultural component in the environmental assessment process is to preserve the agricultural production potential, particularly of scarce arable land, by ensuring that development does not exclude existing or potential agricultural production from such land or impact it to the extent that its future production potential is reduced. However, this project poses

negligible threat to agricultural production potential because of the very low agricultural potential of the site.

2 PROJECT DESCRIPTION

The proposed mining footprint will be 5 ha. The mining method will make use of drilling and blasting in order to loosen the hard rock. The material will then be loaded and hauled to the crushing plant, within the 5 hectare mining area, where it will be screened to various sizes and stockpiled until it is transported from site using tipper trucks. All mining related activities will be contained within the approved mining permit boundaries. Access to the proposed mining area will be via the N1, making use of the existing internal/haul roads to access the mining area.

3 TERMS OF REFERENCE

The terms of reference for this study is to fulfill the requirements of the *Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources*, gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

The verified agricultural sensitivity of the site is low (see Section 6). The level of agricultural assessment required in terms of the protocol for sites verified as less than high sensitivity is an Agricultural Compliance Statement.

The terms of reference for such an assessment, as stipulated in the agricultural protocol, are listed below, and the section number of this report which fulfils each stipulation is given after it in brackets.

1. The Agricultural Compliance Statement must be prepared by a soil scientist or agricultural specialist registered with the South African Council for Natural Scientific Professions (SACNASP) (Appendix 3).
2. The compliance statement must:
    1. be applicable to the preferred site and proposed development footprint;
    2. confirm that the site is of “low” or “medium” sensitivity for agriculture (Section 6); and
    3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site (Section 9).
3. The Agricultural Compliance Statement must contain, as a minimum, the following information:
    1. details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the statement including a curriculum vitae (Appendix 1);

2. a signed statement of independence by the specialist (Appendix 2);
3. a map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool (Figure 2);
4. confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimize fragmentation and disturbance of agricultural activities (not applicable);
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 9);
6. any conditions to which this statement is subjected (Section 9);
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 (not applicable);
8. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr (Section 8); and
9. a description of the assumptions made and any uncertainties or gaps in knowledge or data (Section 5).

4 METHODOLOGY OF STUDY

The assessment was based on a desktop analysis of existing climate, soil and agricultural potential data for the site, supplemented by information supplied by another specialist assessment that included a detailed site visit. A site investigation was unnecessary for this assessment, including for the site sensitivity verification. This is because the limiting factor for land capability is climate, which cannot be assessed by a site inspection. In addition, the mine site is a dolerite koppie with very little soil cover. The site can be reliably assessed, from the above sources of information, as having very low agricultural production potential. There is nothing additional, which could influence the level of agricultural impact, that a site inspection could possibly reveal.

The following sources of existing information were used:

- Soil data was sourced from the land type data set, of the Department of Agriculture, Forestry and Fisheries (DAFF). This data set originates from the land type survey that was conducted from the 1970's until 2002. It is the most reliable and comprehensive national database of soil information in South Africa and although the data was collected some time ago, it is still entirely relevant as the soil characteristics included in the land type data do not change within time scales of hundreds of years.
- Land capability data was sourced from the 2017 National land capability evaluation raster

data layer produced by the DAFF, Pretoria.

- Rainfall and evaporation data was sourced from the SA Atlas of Climatology and Agrohydrology (2009, R.E. Schulze) available on Cape Farm Mapper. Note that Cape Farm Mapper includes national coverage of climate, grazing and certain other data.
- Grazing capacity data was sourced from the 2018 DAFF long-term grazing capacity map for South Africa, available on Cape Farm Mapper.
- Current and historical satellite imagery of the site and surrounds was sourced from Google Earth.

5 ASSUMPTIONS, UNCERTAINTIES OR GAPS IN KNOWLEDGE OR DATA

There are no assumptions, uncertainties or gaps in knowledge or data that affect the findings of this assessment.

6 SITE SENSITIVITY VERIFICATION

In terms of the gazetted agricultural protocol, a site sensitivity verification must be submitted that:

1. confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
2. contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

Agricultural sensitivity, as used in the national web-based environmental screening tool, is a direct function of the capability of the land for agricultural production. The general assessment of agricultural sensitivity that is employed in the national web-based environmental screening tool, identifies all arable land that can support viable crop production, as high (or very high) sensitivity. This is because there is a scarcity of arable production land in South Africa and its conservation for agricultural use is therefore a priority. Land which cannot support viable crop production is much less of a priority to conserve for agricultural use, and is rated as medium or low agricultural sensitivity.

The screening tool classifies agricultural sensitivity according to only two independent criteria – the land capability rating and whether the land is used for cropland or not. All cropland is classified as at least high sensitivity, based on the logic that if it is under crop production, it is indeed suitable for it, irrespective of its land capability rating.

The screening tool sensitivity categories in terms of land capability are based upon the Department of Agriculture's updated and refined, country-wide land capability mapping, released

in 2016. The data is generated by GIS modelling. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land, based on its soil, climate and terrain. The higher land capability values (≥8 to 15) are likely to be suitable as arable land for crop production, while lower values are only likely to be suitable as non-arable grazing land.

A map of the proposed mining area overlaid on the screening tool sensitivity is given in Figure 2. The classified land capability of the site varies from 3 (low-very-low) to 5 (low). The low agricultural sensitivity is confirmed by this assessment, because of the serious climate and soil limitations of the site. The required level of agricultural assessment is therefore confirmed as an Agricultural Compliance Statement.

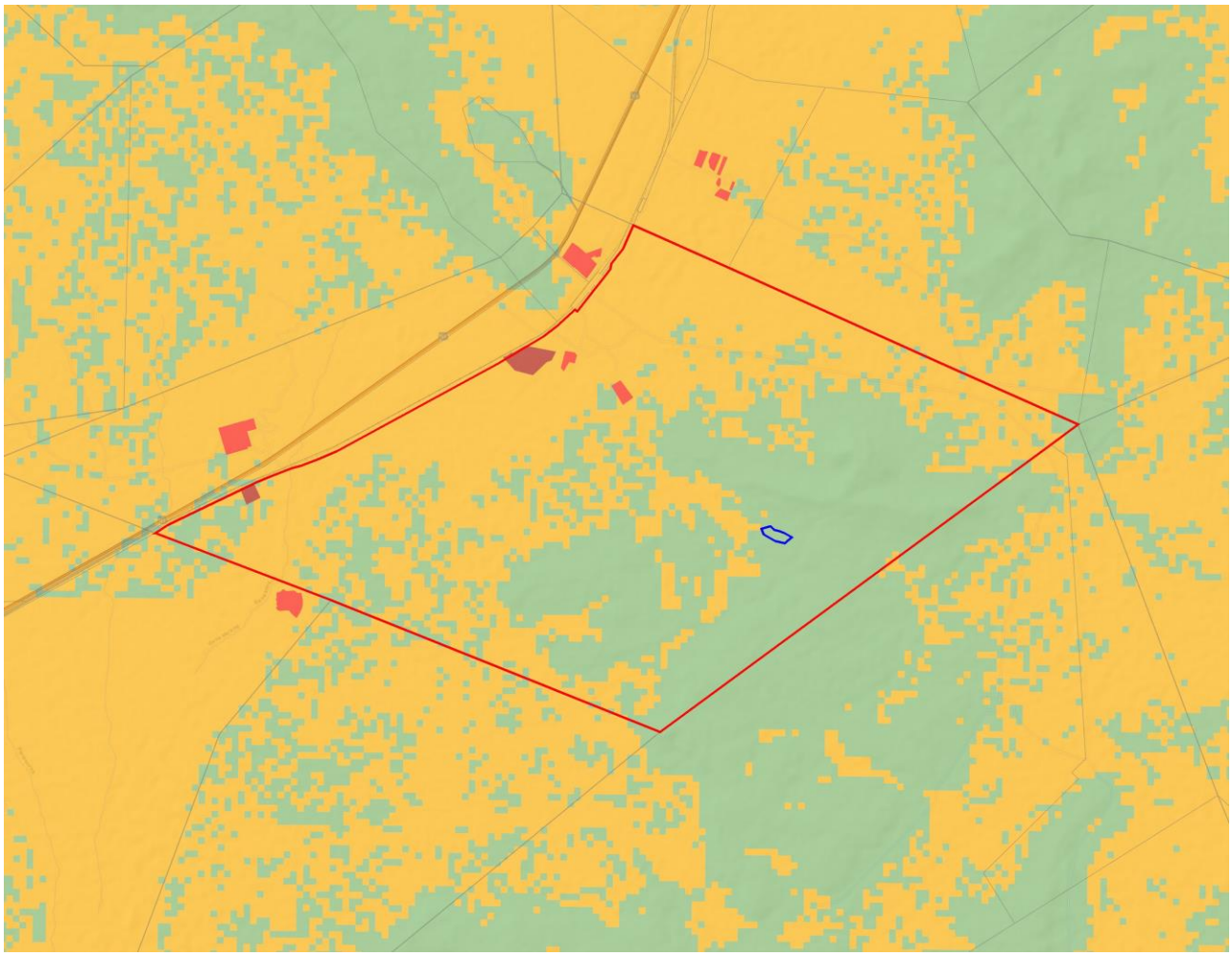

Figure 2. *The proposed property boundary (red outline) and mining area (blue outline) overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high; dark red = very high).*

7 BASELINE DESCRIPTION OF THE AGRO-ECOSYSTEM

A satellite image map of the proposed mining area is given in Figure 3.

The geology of the site is Karoo dolerite suite. The arid climate (low rainfall of approximately 215 mm per annum and high evaporation of approximately 1,390 mm per annum) (Schulze, 2009) is the limiting factor for land capability, regardless of the soil capability and terrain. However, both the soil and terrain are also very limiting, given that the quarry site comprises a ridge/koppie of exposed dolerite outcrop. The site is within a sheep farming agricultural region, which is the only agricultural land use on the site and the dominant one in the area. The land is classified as having a long term grazing capacity of 24 hectares per large stock unit, but in reality the dolerite koppie would have a much lower grazing capacity.

The proposed crushing area is below the koppie on much more level terrain which comprises shallow to moderately deep, sandy soils on underlying rock or hardpan carbonate.

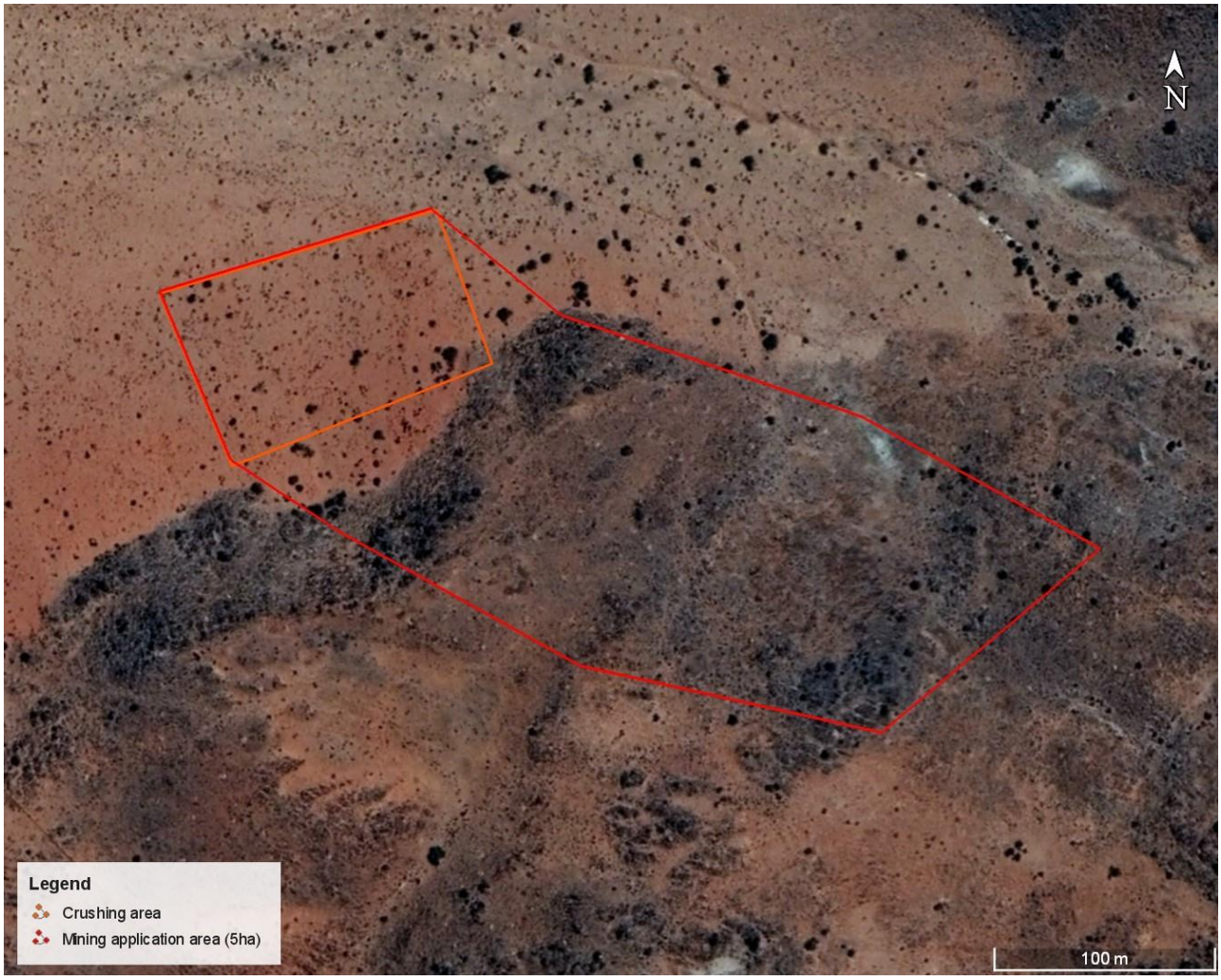

Figure 3. *Satellite image map showing the proposed quarry and crushing areas.*

8 ASSESSMENT OF AGRICULTURAL IMPACT

An agricultural impact is a temporary or permanent change to the future production potential of land. The significance of the agricultural impact is directly proportional to the extent of the change in production potential. When land is lost to agriculture or permanently impacted, the extent of the change in production potential is in turn a direct function of two things, firstly the amount of land that will be lost and secondly, the production potential of the land that will be lost. In this case the amount of land is relatively small (5 hectares) and the production potential of the land is extremely low. The loss of production potential resulting from the proposed mining is insignificantly small and the significance of the agricultural impact is therefore assessed as very low.

The creation of any significant, post-mining soil cover on the quarry site will be practically impossible, given the nature of the hard dolerite rock. Therefore no specific agricultural rehabilitation measures are recommended. Rehabilitation will be largely aesthetic and involve removal of all mining infrastructure, in accordance with mining legislation.

9 CONCLUSIONS

The conclusion of this assessment is that the proposed mining will not have an unacceptable negative impact on the agricultural production capability of the site. This is because the site naturally has extremely low agricultural production potential and very little potential is therefore lost due to mining.

Therefore, from an agricultural impact point of view, it is recommended that the development be approved.

The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions.

10 REFERENCES

Department of Agriculture Forestry and Fisheries (DAFF), 2018. Long-term grazing capacity map for South Africa developed in line with the provisions of Regulation 10 of the Conservation of Agricultural Resources Act, Act no 43 of 1983 (CARA), available on Cape Farm Mapper. Available at: https://gis.elsenburg.com/apps/cfm/

Department of Agriculture, Forestry and Fisheries (DAFF), 2017. National land capability evaluation raster data layer, 2017. Pretoria.

Department of Agriculture, Forestry and Fisheries (DAFF), 2002. National land type inventories data set. Pretoria.

Schulze, R.E. 2009. SA Atlas of Climatology and Agrohydrology, available on Cape Farm Mapper. Available at: https://gis.elsenburg.com/apps/cfm/

APPENDIX 1: SPECIALIST CURRICULUM VITAE

Johann Lanz
Curriculum Vitae

Education

M.Sc. (Environmental Geochemistry)	University of Cape Town	1996 - 1997
B.Sc. Agriculture (Soil Science, Chemistry)	University of Stellenbosch	1992 - 1995
BA (English, Environmental & Geographical Science)	University of Cape Town	1989 - 1991
Matric Exemption	Wynberg Boy's High School	1983

Professional work experience

I have been registered as a Professional Natural Scientist (Pri.Sci.Nat.) in the field of soil science since 2012 (registration number 400268/12) and am a member of the Soil Science Society of South Africa.

Soil & Agricultural Consulting **Self employed** **2002 - present**

Within the past 5 years of running my soil and agricultural consulting business, I have completed more than 170 agricultural assessments (EIAs, SEAs, EMPRs) in all 9 provinces for renewable energy, mining, electrical grid infrastructure, urban, and agricultural developments. I was the appointed agricultural specialist for the nation-wide SEAs for wind and solar PV developments, electrical grid infrastructure, and gas pipelines. My regular clients include: Zutari; CSIR; SiVEST; SLR; WSP; Arcus; SRK; Environamics; Royal Haskoning DHV; ABO; Enertrag; WKN-Windcurrent; JG Afrika; Mainstream; Redcap; G7; Mulilo; and Tiptrans. Recent agricultural clients for soil resource evaluations and mapping include Cederberg Wines; Western Cape Department of Agriculture; Vogelfontein Citrus; De Grendel Estate; Zewenwacht Wine Estate; and Goedgedacht Olives.

In 2018 I completed a ground-breaking case study that measured the agricultural impact of existing wind farms in the Eastern Cape.

Soil Science Consultant **Agricultural Consultors International (Tinie du Preez)** **1998 - 2001**

Responsible for providing all aspects of a soil science technical consulting service directly to clients in the wine, fruit and environmental industries all over South Africa, and in Chile, South America.

Contracting Soil Scientist **De Beers Namaqualand Mines** **July 1997 - Jan 1998**

Completed a contract to advise soil rehabilitation and re-vegetation of mined areas.

Publications

- Lanz, J. 2012. Soil health: sustaining Stellenbosch's roots. In: M Swilling, B Sebitosi & R Loots (eds). *Sustainable Stellenbosch: opening dialogues*. Stellenbosch: SunMedia.
- Lanz, J. 2010. Soil health indicators: physical and chemical. *South African Fruit Journal*, April / May 2010 issue.
- Lanz, J. 2009. Soil health constraints. *South African Fruit Journal*, August / September 2009 issue.
- Lanz, J. 2009. Soil carbon research. *AgriProbe*, Department of Agriculture.
- Lanz, J. 2005. Special Report: Soils and wine quality. *Wineland Magazine.*

I am a reviewing scientist for the *South African Journal of Plant and Soil*.

APPENDIX 2: DECLARATION OF THE SPECIALIST

Note: Duplicate this section where there is more than one specialist.

I, **Johann Lanz**, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
  - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
  - ~~am not independent, but another specialist that meets the general requirements set out in Regulation 13 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);~~
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Signature of the specialist: 

Date: **20 March 2023**

Name of company: **Johann Lanz – soil scientist (sole proprietor)**

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Johan Lanz

Registration Number: 400268/12

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following fields(s) of practice (Schedule 1 of the Act)

Soil Science (Professional Natural Scientist)

Effective **15 August 2012** Expires **31 March 2023**

Chairperson

Chief Executive Officer