

PALAEONTOLOGICAL HERITAGE COMMENT:**PROPOSED EXTENSION OF EXISTING DOLERITE QUARRY ON FARM 120 WAAI KRAAL NEAR BEAUFORT WEST, BEAUFORT WEST LOCAL MUNICIPALITY (CENTRAL KAROO DISTRICT MUNICIPALITY), WESTERN CAPE PROVINCE**

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Based on Google Earth© satellite imagery as well as extensive field photographs provided by ASHA Consulting the proposed dolerite mining extension area on Farm 120 Waai Kraal near Beaufort West, Western Cape, is entirely underlain by massive intrusive dolerite with no obvious exposure of sedimentary bedrocks of the Lower Beaufort Group (Karoo Supergroup). A substantial portion of the area is already disturbed by previous mining activities (Figure 1). The Karoo dolerite bedrocks to be exploited by the planned mining are entirely unfossiliferous while fossil preservation within any adjacent sedimentary country rocks has almost certainly been compromised by thermal metamorphosis (baking) and pneumatolysis by hot circulating fluids during intrusion. No fossil remains were recorded during a previous site visit to the adjoining dolerite mining area by Almond & Tusenius (2021). Late Caenozoic superifical sediments (*viz.* eluvial dolerite rubble, stream alluvium, skeletal soils) are generally of Very Low palaeosensitivity.

Given the very low palaeosensitivity of the quarry extension project area and its small footprint, no further specialist palaeontological monitoring or mitigation for this mining development is recommended, pending the unlikely discovery of significant chance fossil finds before or during excavation. The tabulated Chance Fossil Finds Protocol is appended to this report should be included in the EMP_r for the quarry.

REFERENCES

ALMOND, J.E. & TUSENIUS, M.L. 2021. Proposed dolerite quarry on Portion 4 of the Farm 120 Waai Kraal near Beaufort West, Beaufort West Local Municipality (Central Karoo District Municipality), Western Cape Province. Palaeontological heritage report: combined desktop & field-based study, 19 pp. Natura Viva cc, Cape Town.

Appendix 1: Dolerite quarry on Portion 4 of the farm Waai Kraal 120 near Beaufort West		
Province & region:	Western Cape: Central Karoo District Municipality	
Responsible Heritage Resources Agency	Heritage Western Cape (3 rd Floor Protea Assurance Building, 142 Longmarket Street, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 021 483 5959 Email: ceoheritage@westerncape.gov.za)	
Rock unit(s)	Karoo dolerite, Teekloof Formation (Lower Beaufort Group), Late Caenozoic alluvium / eluvium / soils.	
Potential fossils	Fossil vertebrate bones, teeth, trace fossils, trackways, petrified wood, plant-rich beds in the Lower Beaufort Group bedrocks. Fossil mammal bones, teeth, horn cores, freshwater molluscs, plant material, trace fossils in Late Caenozoic sediments.	
ECO protocol	1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (<i>N.B.</i> safety first!), safeguard site with security tape / fence / sand bags if necessary.	
	2. Record key data while fossil remains are still <i>in situ</i> : <ul style="list-style-type: none"> • Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo • Context – describe position of fossils within stratigraphy (rock layering), depth below surface • Photograph fossil(s) <i>in situ</i> with scale, from different angles, including images showing context (e.g. rock layering) 	
	3. If feasible to leave fossils <i>in situ</i> : <ul style="list-style-type: none"> • Alert Heritage Resources Agency and project palaeontologist (if any who will advise on any necessary mitigation) • Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Agency for work to resume 	3. If <i>not</i> feasible to leave fossils <i>in situ</i> (emergency procedure only): <ul style="list-style-type: none"> • <i>Carefully</i> remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g. entire block of fossiliferous rock) • Photograph fossils against a plain, level background, with scale • Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags • Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist • Alert Heritage Resources Agency and project palaeontologist (if any) who will advise on any necessary mitigation
	4. If required by Heritage Resources Agency, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.	
	5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Agency	
Specialist palaeontologist	Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository (e.g. museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Agency. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Agency minimum standards.	



Figure 1: Google Earth© satellite image of the proposed new dolerite mining area on Farm 120 Wai Kraal near Beaufort West, Western Cape (green polygon). A substantial portion of the area is already disturbed by previous mining activities while potentially fossiliferous sedimentary bedrocks are not exposed here.