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REPUBLIC OF ZAMBIA GEOLOGICAL POTENTIAL REPORT

A BRIEF OVERVIEW OF THE POTENTIAL OF ZAMBIA MINERAL RESOURCES

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In the Republic of Zambia, preliminary exploration and evaluation studies have been conducted on mining sites containing ores of **precious metals** (gold, silver), **base metals** (copper, nickel), **ferrous metals** (titanium, iron), and **platinum group elements** (PGE) (platinum, palladium, rhodium, iridium, and others). Most of the targets for future drilling exploration are located within **Concessions N (in the north) and S (in the south)** (Fig. 1). Additionally, several licensed areas exist in the region where geological exploration has not yet been conducted, though exploration permits have already been granted.

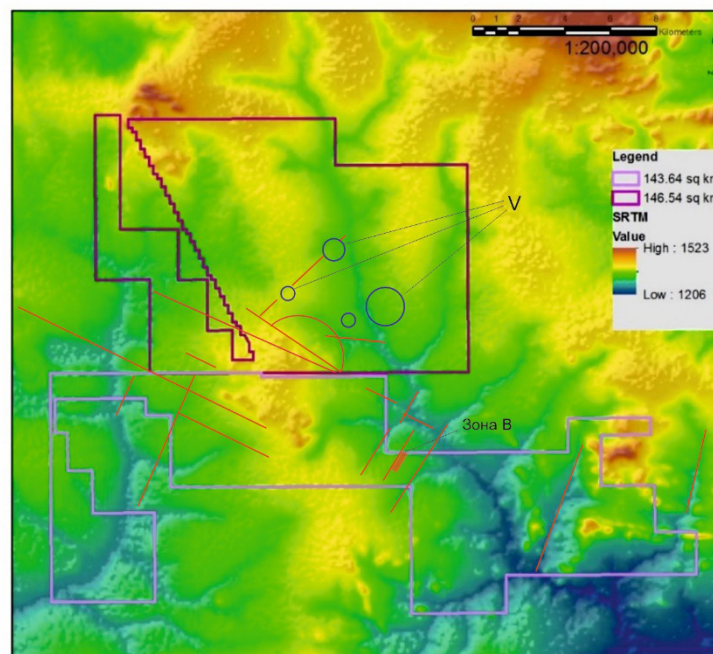


Fig. 1. Boundaries of the Concessions and locations of Ore Zone B and restored volcanic structures.

Previously, a **remote sensing study** of the two concessions (Fig. 1) was conducted using **satellite image interpretation**, spectral analysis, SRTM models, neotectonic, and geomorphological analysis. A **comprehensive interpretation of the data** revealed various geological structures composed of different rock formations with distinct **metallogenic specializations**, findings that were later confirmed by subsequent fieldwork.

Concessions N and S are administratively located in the **North-Western Province of Zambia**. The distance from the northern boundary of **Concession N** to the **Democratic Republic of Congo** is **130 km north**, while the nearest point of the **Angolan border** is **200 km west**. The key settlement of **Kasempa** is **20 km southwest** of the concessions.

Other nearby settlements include **Kawana (1 km north, Fig. 1)**, **Kakwenda (1.5 km northwest)**, **Kapiji (8 km west)**, and **Muluya (7 km south)**. The total study area, calculated using **GIS tools** based on the concession boundaries provided by the client, amounts to **288 km²** (144 km² for Concession N and 144 km² for Concession S).

From a **physiogeographical perspective**, the area represents a **dissected highland terrain** with elevations ranging between **1,416 and 1,232 meters**, averaging **1,317 meters**, with a standard deviation of **28.5**

meters (Fig. 2). The region is characterized by hilly topography with varying slope gradients, divided by two closely spaced, subparallel **watershed basins**. The topography exhibits a general **north-to-south downward slope**, with a **submeridional ridge** running approximately through the center, separating the two adjacent watersheds.

EXPLORATION STATUS

Currently, **combined prospecting, evaluation, and reconnaissance drilling (locally within identified zones)** is being conducted within the **concessions**. The goal of these **exploration and assessment activities** is to:

- **Preliminarily assess the geological structure** of ore-bearing sequences.
- **Determine the geological-industrial types of ore mineralization**, its profile, and element concentrations.
- **Provide an initial estimation of ore volumes** and potential extraction technologies.

New **rock types** have been identified within the concessions, defining the **metallogenic specialization** of rock complexes and their potential association with specific ore-bearing zones.

Fieldwork has **reclassified** previously described **mafic dike rocks**, proving that they are, in fact, **extrusive volcanic rocks** with numerous **lava flow features** (wrinkled ropy lava, pillow-lava synvolcanic textures, and columnar jointing). This significantly **redefines their metallogenic potential**, particularly for **platinum group elements (PGE) and lanthanides**, altering previous assessments of their economic viability.

Additionally, **several extensive ore zones with economically viable gold concentrations** have been identified.

ORE ZONES

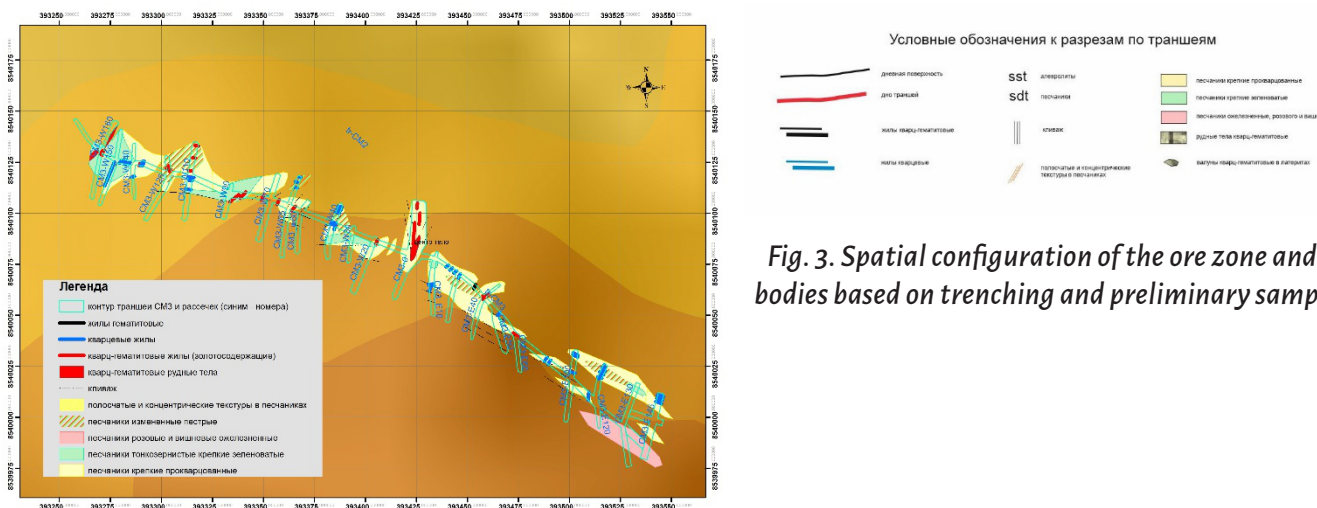
Exposed by an **open pit**, this zone represents a **massive (25–30 m thick) system of spatially clustered ore zones** with a **linear strike of $60^\circ \pm 5^\circ$ ($13^\circ 10' 30''\text{N}$ / $26^\circ 4' 8''\text{E}$)**. The zone has been traced for **at least 1 km**. The deepest part of the **open pit (20–25 m depth)** is located in the **southwestern** section of the ore zone. The current **average gold grade** in the ore zone is no less than **4 g/t**.



Ore Zone B

A **15 × 350 m vein-stockwork zone**, consisting of **intersecting quartz veins ranging from a few millimeters to 1.5 m in thickness**. These veins group into a **15–17 m wide mineralized zone**, striking **280° ±5°**. The zone has been extensively **trenched and crosscut** (Fig. 3) over a **350 m** length, with mapping ongoing along its strike.

Due to **ongoing geological exploration**, the **commercial resource potential** has not yet been fully assessed. However, the **gold content** in ores is **industrial-grade**, reaching up to **16 g/t**.



ICP-MS assays confirm that, in addition to gold (ranging up to **15.62 g/t**), significant concentrations of **rhodium (0.408 g/t)**, **iridium (1.24–1.49 g/t)**, **cobalt (0.642–0.707 g/t)**, and **nickel (0.226 g/t)** are also present. Further mining and exploration work is ongoing.

Ore Zone C

A **130 × 240 m zone** of **massive ferruginous lava flows**, composed of **crystalline hematite, bornite mineralization**, brecciated **quartz veins**, and **sulfide mineralization** (pyrite, chalcopyrite, bornite, pyrrhotite). The zone hosts **economically viable concentrations** of **gold and platinum group elements (PGE)**, including:

- **Palladium: 0.19–1.06 g/t**
- **Rhodium: 0.152 g/t**
- **Iridium: up to 1.93 g/t**

Exploration of the zone is ongoing.

Ore Zone D

Located within a **volcanic structure**, consisting of **crystalline ferruginous lava flows** hosting **gold, copper, and PGE mineralization**. Lava flows exhibit **fine-grained pillow structures (2–2.3 cm diameter)** and **large pillow-textured flows (0.7–0.8 m diameter)**, suggesting **layered volcanic flows**.



Figs. 4 Fine-pillow iron-rich lava flows (samples Tn 101).



Figs. 5. Large-pillow iron-rich lava flows exposed in trenching (samples Tn 296).

Ore Zone E

Situated in the **marginal sections of a newly identified caldera complex**, this zone features **vesiculated lavas** with promising **gold, copper, and PGE mineralization**. Lava flows exhibit **fine-pillow and large-pillow synvolcanic textures**, indicative of **submarine volcanic extrusion**.

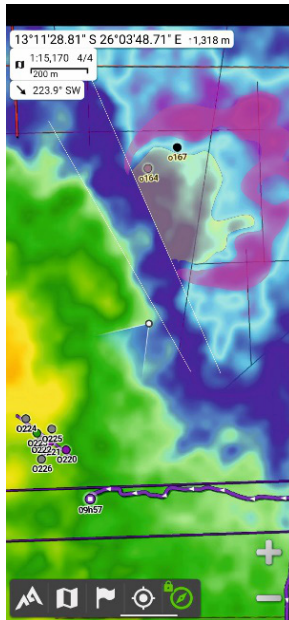


Fig. 6. Vesiculated lavas from mechanical dispersion halos formed during peneplanation of the caldera fragment (samples Tn 164 & Tn 167).

Ore Zone F

A **quartz vein system of the Alpine type**, studied through **trenches and open pits**. This zone holds **significant industrial interest** as a **source of high-quality piezoquartz**. The veins are also associated with **gold and copper mineralization**.



Fig. 7. Quartz crystal druse boulders from a nearby open pit.