To:	Karo Platinum Zimbabwe Private Limited	**Date:**	October 2024
From:	Digby Wells Environmental	**Proj #:**	KAP7880
RE:	Environmental and Social Impact Assessment Addendum		

Introduction and Context

Karo Platinum Zimbabwe Private Limited (Karo Platinum) intends to develop the Karo Platinum Group Metals (PGMs) Mine and processing facilities in southwest Harare, Zimbabwe. Black Crystal Consulting (PVT) Ltd (Black Crystal) conducted the initial Environmental and Social Impact Assessment (ESIA) in 2021, which was approved by the Environmental Management Agency (EMA). In 2022, SLR Consulting Africa (Pty) Ltd was retained to conduct an independent Environmental and Social Due Diligence (ESDD) review for Société General, a potential lender, and identified gaps in compliance with the International Finance Corporation (IFC) Performance Standards.

Digby Wells Environmental (Digby Wells) has been appointed by Karo Platinum to update the ESIA and the Environmental and Social Management and Monitoring Plan (ESMMP) to align with these standards. This document serves as an addendum to the ESIA and ESMMP.

Project Description

The Karo Platinum Mining Lease (ML) for Platinum Group Metals (PGMs) was issued on 12 March 2021 and covers an area of 23 908 hectares (ha) along the Great Dyke, in the Mhondoro-Ngezi PGM Belt near Selous in Chegutu District, Zimbabwe. The Project is located in the Mashonaland West province of Zimbabwe, approximately 80 kilometres (km) southwest of Harare and 35 km southeast of Chegutu. The Project area extends south of Selous Town The Karo Platinum Mine will be developed in four phases, where this Project, and related ESIA, are included in Phase 2a: development of up to 175 000 tonnes per month (tpm) operation, including the south-eastern open pit (KPSE) and supporting infrastructure. Other phases will be subject to separate ESIA processes and will be developed at a later stage.

The expected life of mine (LOM) for the KPSE is approximately 10 years with anticipated production of 5.94 million tonnes per annum (mtpa) of PGMs. The operation will be a conventional truck-and-shovel open pit using front-end loaders and a fleet of haul trucks. The existing approved infrastructure includes staff accommodation, power supply from multiple 5 kilovolt-ampere (kVA) generators, water supply (camp and drilling operations) from the Mapfure River, access roads from existing farms and a mechanical workshop.

The proposed additional infrastructure for the Project includes:

- Additional accommodation and mine village which will extend over 20 hectares (ha) on the Coburn 8 Farm;
- Mining workshop area for vehicles, storage areas, offices, tyre and wash bay;
- Additional ancillary and supporting infrastructure such as medical facilities, offices, security, fencing, hazardous material stores, water and sewage treatment facilities, solid waste management and explosive storage facilities etc;
- External and internal road networks, including haul roads and linking the Selous-Ngezi and Chegutu-Mubaira roads;
- Open pit (approximately 274 ha);
- Concentrator Plant (approximately 35 ha);
- Soil, soft and hard overburden stockpiles including waste rock dumps (WRDs);
- Tailing storage facility (TSF);
- Wastewater treatment facilities, one at the accommodation camp, one at the concentrator and one at the Salene Camp;
- Two dirty water dams (pollution control dams): Stormwater Dam and Concentrator Raw Water Dam; and
- Waste management facilities including an onsite landfill to be developed once a suitable site is identified. In the interim, general and domestic waste will be disposed of at the Chegutu Landfill site and hazardous waste at the Pomona Landfill site in Harare.

Additional infrastructure related to Karo Platinum mine that is subject to separate ESIA processes includes:

- Bulk Electricity Supply (Phase 2b) – A 132 kV powerline approximately 31 km in length from the Zimbabwe Electricity Transmission and Distribution Company (ZETDC) Selous – Ngezi substation to the Karo Platinum Mine, which will cross over the Mupfure River. A 132/11 kV substation and switching station will be constructed in the vicinity of the mine's proposed southeast concentrator plant;
- Bulk Water Supply (Phase 2c (1)) – To be implemented in two phases: Phase 1 will consist of abstraction water from the Teith and Chiganze Dams, boreholes and the Zinca shaft and Phase 2 will include abstraction from the existing and proposed dams, reuse and recycle of process water, including a 35 km long water pipeline;
- Waste Disposal Facilities (Phase 2c (2)) – the establishment of a waste management facility;
- Open Pit (Phase 2(d)) – The establishment of three new pits at the Karo Platinum mine;
- PGM and base metals refining facility (Phase 3); and

- Additional energy supply (Phase 4) – to develop, construct and operate a Solar Photovoltaic (PV) Power Plant (60 Megawatt (MW)).

A Resettlement Plan Framework has been developed and submitted to the EMA and an Early Land Access (ELA) Resettlement Action Plan (RAP) is in progress detailing the compensation of landowners where the proposed Project will be located. The ELA encompasses a total area of 1173.4 ha, located within Ward 26 of the Chegutu District where 16 land parcels have been identified. A total of 48 structures were confirmed during the asset survey carried out by Black Crystal in 2021.

Environmental Baseline

There are natural and undisturbed areas that are important for local flora and fauna within the proposed project footprint, where there is an anticipated direct impact of about 521.28 ha directly and an additional 1,711.10 ha may be at risk of disturbance.

The main habitat type in the area is black vertic soil vegetation and the 2022 ESIA identified two rare specially protected plant species, namely Aloe and Leopard Orchid. No other rare species were found during their surveys. While there are no critical habitats within the project site, features of ecological importance such as riparian vegetation along the Mupfure and Chirundazi rivers as well as Miombo woodlands were observed.

No mammals classified as Species of Conservation Concern (SCC) were observed however Vervet Monkeys and Aardwolf were found. Tracks from several species, including Porcupine, Duikers, and Scrub Hares, were also noted. Additionally, fresh burrows from Antbears were discovered on the ridge near the proposed ore stockpile site.

In 2022, a total of 124 bird species were identified, including the critically endangered White-backed Vulture and the endangered Martial Eagle. No amphibians, reptiles, invertebrates or aquatic SCC were found in the area. Additionally, two invasive fish species were recorded, Nile tilapia and Large-mouth bass.

The project will lead to changes in land cover impacting the supply of ecosystem services and altering the physical landscape and visual appeal of the area, which is important to local cultural heritage. The significance of the potential impacts on ecosystem service provision ranged from minor to negligible prior to the implementation of proposed mitigation measures. This was attributed primarily to the modified state of the Project area prior to Project initiation and the limited extent of the Project footprint. Implementation of the recommended mitigation measures reduced the significance ratings of all impacts to minor or negligible.

The surface water quality in the project area was within the IFC Effluent, EMA effluent and the World Health Organisation (WHO) drinking water standards indicating good water quality of the upstream and downstream water bodies. However, climate change is expected to lead to higher temperatures, more extreme heat events, and increased drought. The primary water sources will be the Chiganze and Chirundazi Dams and nearby boreholes. If water demand changes, the water balance needs to be updated. The Teith and Chiganze Dams will be used for water extraction in the first phase. The implementation of the Storm Water Management Plan (SWMP) will assist in preventing local water contamination.

Noise levels are expected to exceed acceptable limits for the construction (daytime) and operational (daytime and nighttime) phases. The current background noise levels at most locations are higher than predicted and it is likely that the future noise from the project will be masked by existing background noise.

The dust deposition rates were within the sensitive residential receptor limit and are not expected to exceed various guideline values during operation when mitigation measures are applied. Therefore, the impacts are deemed as major without mitigation measures and will be reduced to a negligible impact after mitigation measures are implemented.

Key roads affected by the project include A5, Selous-Ngezi Road, and Gravel Road which provide access to the development site and the Selous Chrome Mine. Traffic count data indicates that these roads currently experience low traffic volumes and are operating well below capacity, suggesting a low risk of increased traffic issues. The proposed mine is expected to increase traffic by 18 vehicles per hour during construction and 74 vehicles per hour during operations. Road intersections should continue to perform adequately and safety risks from other road users and potential road deterioration are considered medium risks.

The groundwater quality was in good condition with neutral to slightly alkaline pH and low EC. Background sulphate concentrations are low, suggesting these elements will cause acceptable seepage. The geochemical assessment found that there is no significant risk of acid mine drainage from the WRD. In a worst-case scenario, TSF seepage could lead to sulphate plumes migrating about 1.4 to 3 km within the fractured aquifer affecting nearby boreholes. The best-case scenario with mitigation and management measures will result in the sulphate plume remaining in the direct vicinity of the TSF.

Geochemical analysis of the site showed no acid generating materials and no fast acid neutralising minerals, however, silicate minerals that can contribute to acid neutralising were identified. Results from acid-base accounting (ABA), sulphur speciation, and Net Acid Generating tests confirm the lack of acid-forming minerals in the waste rock, supported by low levels of sulphide sulphur. The assessment indicates that leachate from waste rock will be alkaline, with a pH ranging from 8.9 to 9.9.

Social Baseline

The project area is located in the Chegutu District which has a population of 204,245 making up 13.6% of the total population of Mashonaland West. The average household size is 4.2 people in rural areas and 3.9 in urban areas, with 75.2% of households led by males. Over half of the provincial population is aged 19 and under, while 5% are aged 60 and older. The main ethnic groups are Zezuru and Korekore, who speak Shona, though many rural communities have migrated from Malawi and Mozambique. The literacy rate is 93.4% for those aged 15 and older, with 94.1% of children aged four and above attending school.

The primary economic activity in Mashonaland West is farming and animal husbandry. In the Chegutu District, key crops include maize, cotton, sunflower, soybean, sorghum, groundnuts, seed maize, and both flue-cured and burley tobacco. Additionally, artisanal small-scale mining (ASM) is present in the area, mainly focusing on gold and chrome extraction, often referred to locally as Makorokoza.

Mashonaland West has nine rural hospitals and 170 rural health centres and clinics with hospitals located in Chinhoyi and Chegutu. Malaria significantly contributes to long-term illnesses and premature deaths in Zimbabwe. In rural areas, boreholes and protected wells provide the main source of household water for 78% of residents. Most households (58%) in the province have access to improved sanitation facilities, while only 8% use basic sanitation, and 34% of the population practices open defecation.

The 2022 ESIA identified a total of 224 graves and 30 sacred sites within the total Karo Platinum mine footprint and specifically, two graves and four sacred sites are located within the current proposed project area. The sacred sites nearby include Chikomo cheNinga (low hills next to the main Selou-Ngezi road) and Gomo raMukahanana (Rutara hills), both of which are used for burials and other traditional purposes.

Identified Significant Impacts

The potential impacts that have been identified in the ESIA addendum are provided below:

Construction Phase

- Ecosystem services
  - Loss and degradation of provisioning, supporting and cultural services.
- Wetlands
  - Site clearance, vegetation removal, and soil stripping may lead to the loss of wetland habitat and the permanent displacement or loss of fauna, including invertebrates, birds, and mammals; and
  - Sedimentation and contamination of downstream and adjacent wetlands and watercourses which may lead to soil and water contamination.
- Surface water
  - Alteration of channel geometry which may lead to reduced flow regimes in affected watercourses; and
  - Alternation of surface water drainage patterns and reduction of the effective catchment area, thus reducing the streamflow.
- Hydropedology
  - Sedimentation and siltation of surface water resources resulting from erosion of disturbed soils and discarded materials during site clearance and excavation.

- Social
  - Construction activities will result in additional vehicles and equipment movement causing a general increase in community health and safety risks. Furthermore, job opportunities may result in influx of job seekers, skilled labourers and contractors which may increase social ills such as crime and conflict.

Operational Phase

- Wetlands
  - The general operations of the mine may lead to unforeseen and residual impacts, such as erosion, potential hydrocarbon and reagent spills, sedimentation and changes to the current habitat and biodiversity (increased AIPs).
- Surface water
  - The downstream catchment will experience a decreased water contribution due to the TSF and open pit capturing rainfall and runoff.
- Blasting
  - Damage to houses or infrastructure not owned by the mine; and
  - Damages to houses or infrastructure, fatality or injury to people or animals due to flying rocks, and air blasts.
- Groundwater
  - Abstracting groundwater will drawdown (lower) the groundwater levels in the vicinity of the KPSE Pit, also result in potential impacts on wetland extent and functionality, as well as impact on catchment yield.

Decommissioning Phase

- Surface water
  - Contamination of water resources by mine waste material and runoff from contaminated surfaces and use of hydrocarbons.
- Hydropedology
  - Migration of contamination plume from backfilled opencast pit during groundwater recovery and decant of contaminated water into water resources.

Climate Change Risks and Vulnerabilities

The project with a lifespan of 17 years is expected to emit a total of 5.22 million tonnes of carbon dioxide equivalents (tCO_2e) during its construction and operation phases (4.5 million tCO_2e directly and 0.7 million tCO_2e indirectly). This translates to an average of 275,000 tCO_2e

per year over the 19 years (2 years of construction and 17 years of operation). The emissions are projected to increase Zimbabwe's annual emissions by 0.3%, representing a minor contribution in line with typical mining operations.

Key climate change risks for the project include rising temperatures in Chegutu, leading to more frequent extreme heat days and potential flooding of nearby rivers like the Mupfure. Additional risks involve increased droughts and water scarcity which could affect mining operations, reduce water availability, and damage infrastructure from wildfires and extreme weather events.

Management and Monitoring Plan

To address the impacts identified during the ESIA process, an ESMMP has been created. This plan outlines mitigation measures designed to avoid or minimise negative impacts and their likelihood. It includes the development and implementation of various strategies along with monitoring processes to ensure these measures are effective.

Conclusion

Based on the impact assessment results and the effective implementation of mitigation and management measures by Karo Platinum, the Project is not expected to cause significant irreversible environmental or social impacts that would outweigh the socio-economic benefits of mining. To ensure ongoing success, it is crucial to implement the prescribed ESMMP to minimise negative impacts and enhance positive benefits. Periodic audits by an independent auditor are recommended to verify that the project activities align with the objectives and commitments outlined in the ESMMP.

Regards,

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Environmental Consultant