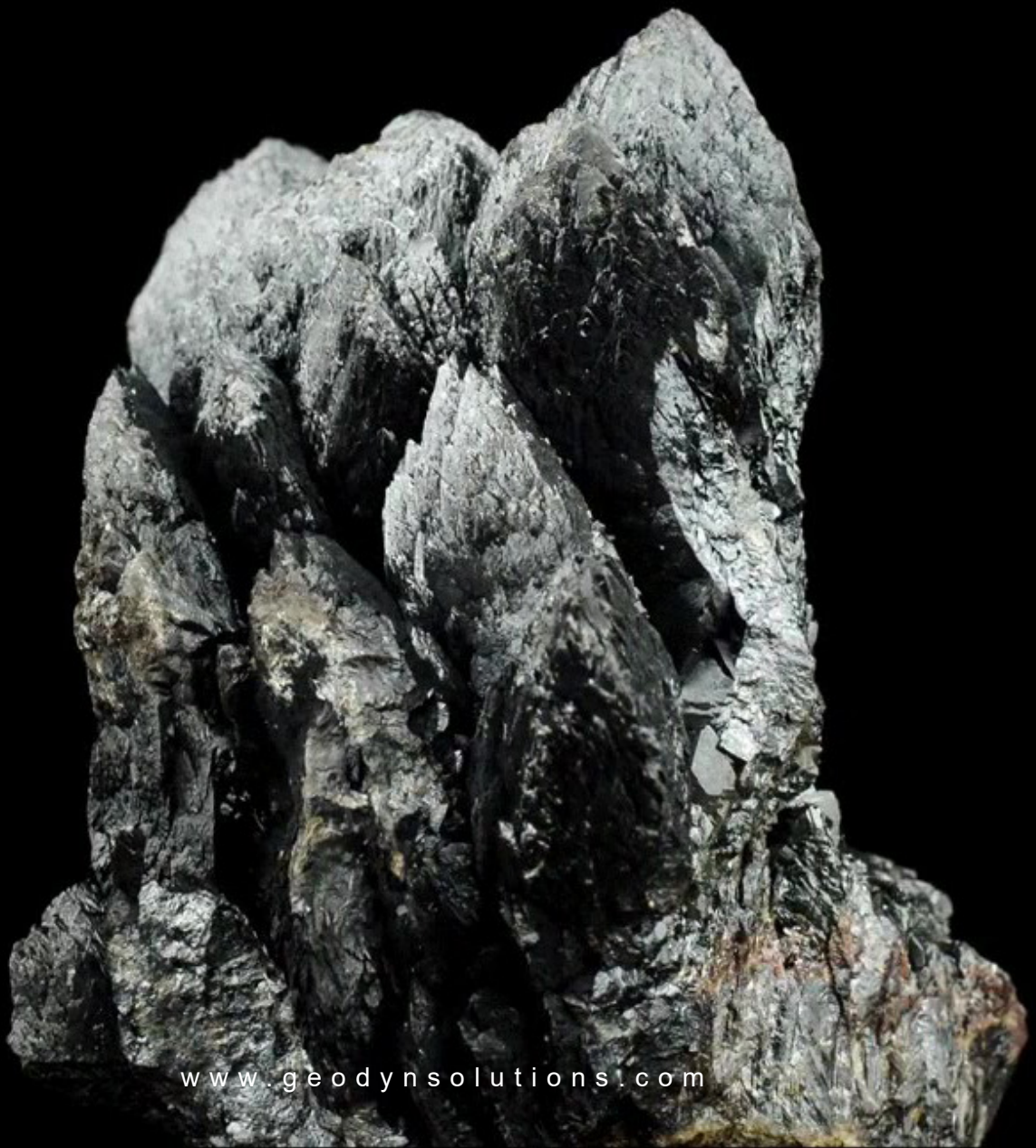
GEODYN™
SOLUTIONS

# SUSTAINABLE RARE EARTH ELEMENT EXTRACTION IN ZAMBIA WITH MOBILE POWER INFRASTRUCTURE AND SCALABILITY TO GOLD, SILVER & COPPER



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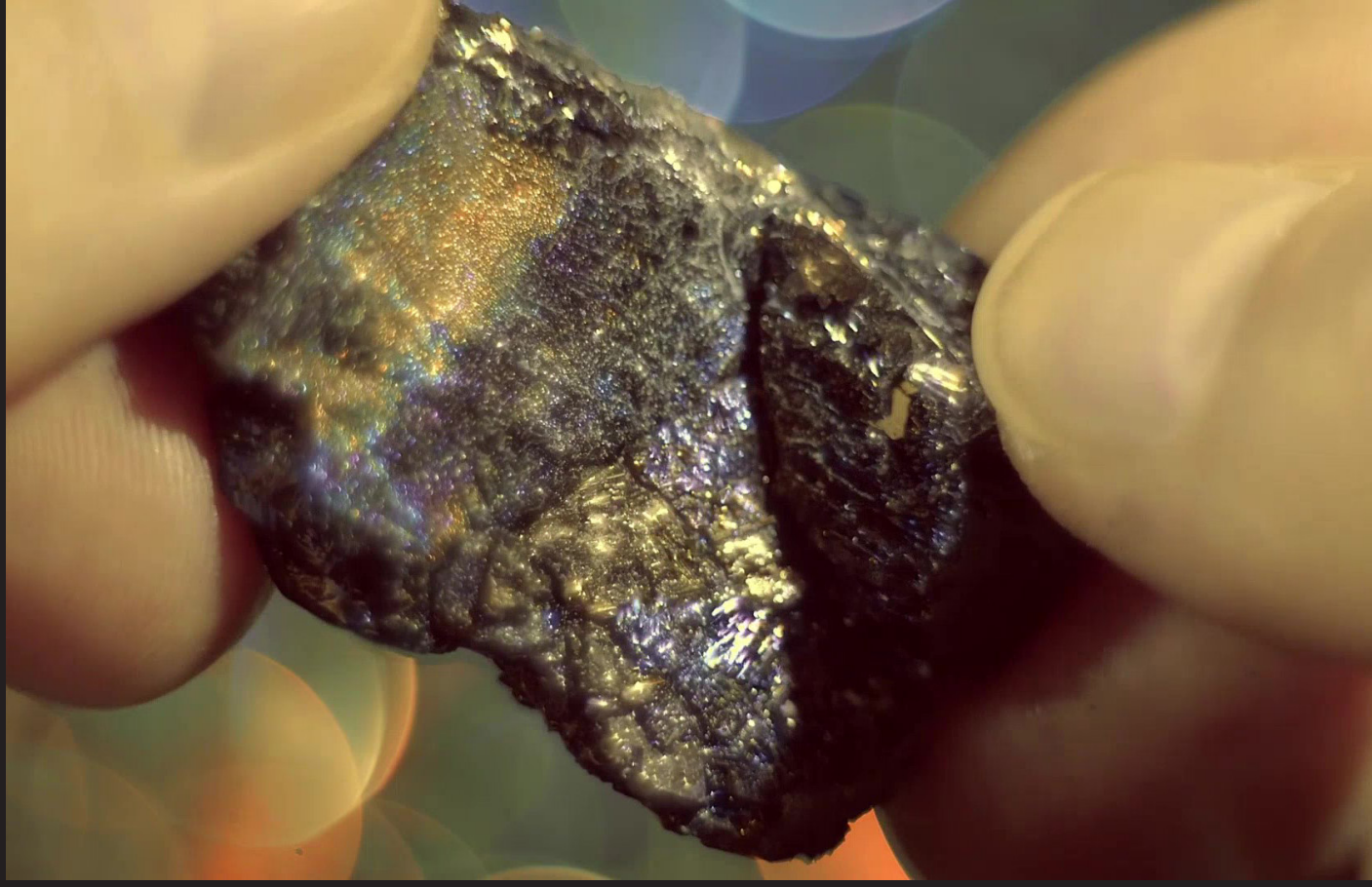
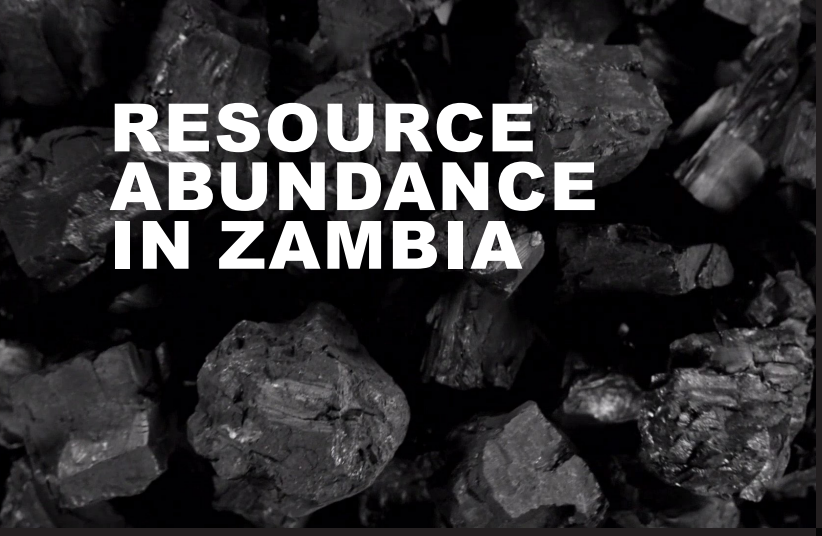


# EXECUTIVE SUMMARY

Geodyn Solutions proposes an environmentally responsible, large-scale rare earth element (REE) extraction and processing project in Zambia that integrates organic leaching technologies, microbial remediation, and a mobile natural gas power plant with Organic Rankine Cycle (ORC). This project is strategically designed to scale up for gold, silver, and copper extraction, leveraging Zambia's vast untapped mineral wealth while restoring ecosystems and creating long-term economic benefits.

The flexible and modular nature of our green extraction platform allows for seamless integration with additional high-value metals—ensuring maximum profit potential and global competitiveness for Zambia in the critical minerals market.



# RESOURCE ABUNDANCE IN ZAMBIA

## COPPER

- Zambia is Africa's second-largest copper producer.
- Major deposits in Copperbelt Province and Northwestern Province (Kansanshi, Kalumbila).
- Ideal synergy with REE and gold operations for shared infrastructure, power, and logistics.

## RARE EARTH ELEMENTS (REES)

- Eastern Province (Petauke, Kasenengwa): Monazite and bastnaesite sources of neodymium, lanthanum, praseodymium.
- Kapiri Mposhi (Central Province): REE-rich carbonatites and alkali complexes.
- Luapula Province: Ionic clays and surface-accessible rare earth-bearing sediments.
- Chilwa Alkaline Province: Heavy REEs like dysprosium and terbium.

## GOLD

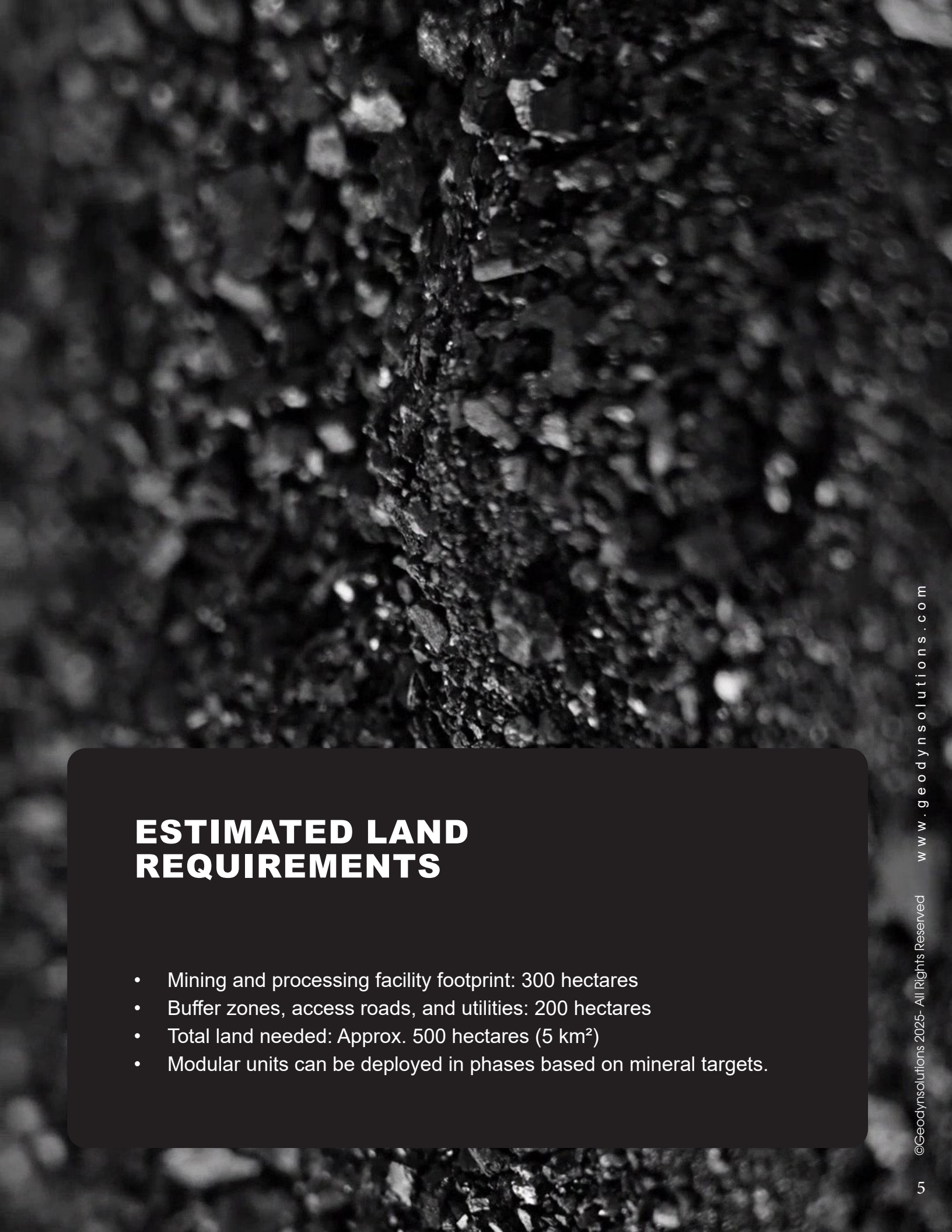
- Gold deposits across Eastern, Northwestern, and Central Provinces.
- Artisanal gold mining common in Vubwi, Petauke, Lufwanyama, and Mwinilunga.
- Significant reserves remain underexplored and are ideal for bio-leaching applications.

## SILVER

- Frequently co-located with copper and gold.
- Present in Kabwe, Ndola, and polymetallic veins across the Copperbelt.
- Often overlooked in tailings and historic mine waste—ideal for reprocessing using organic extractants.

# PROPOSED LOCATIONS FOR MAXIMUM IMPACT

| LOCATION | ADVANTAGES |
|---|---|
| **Petauke District** | Rich in REEs and gold; access to natural gas; flat terrain for plant setup |
| **Kapiri Mposhi** | Central access; REEs, copper, and gold; rail connectivity to export hubs |
| **Luapula Province** | REEs in clay form; low population pressure; suitable for large land leases |

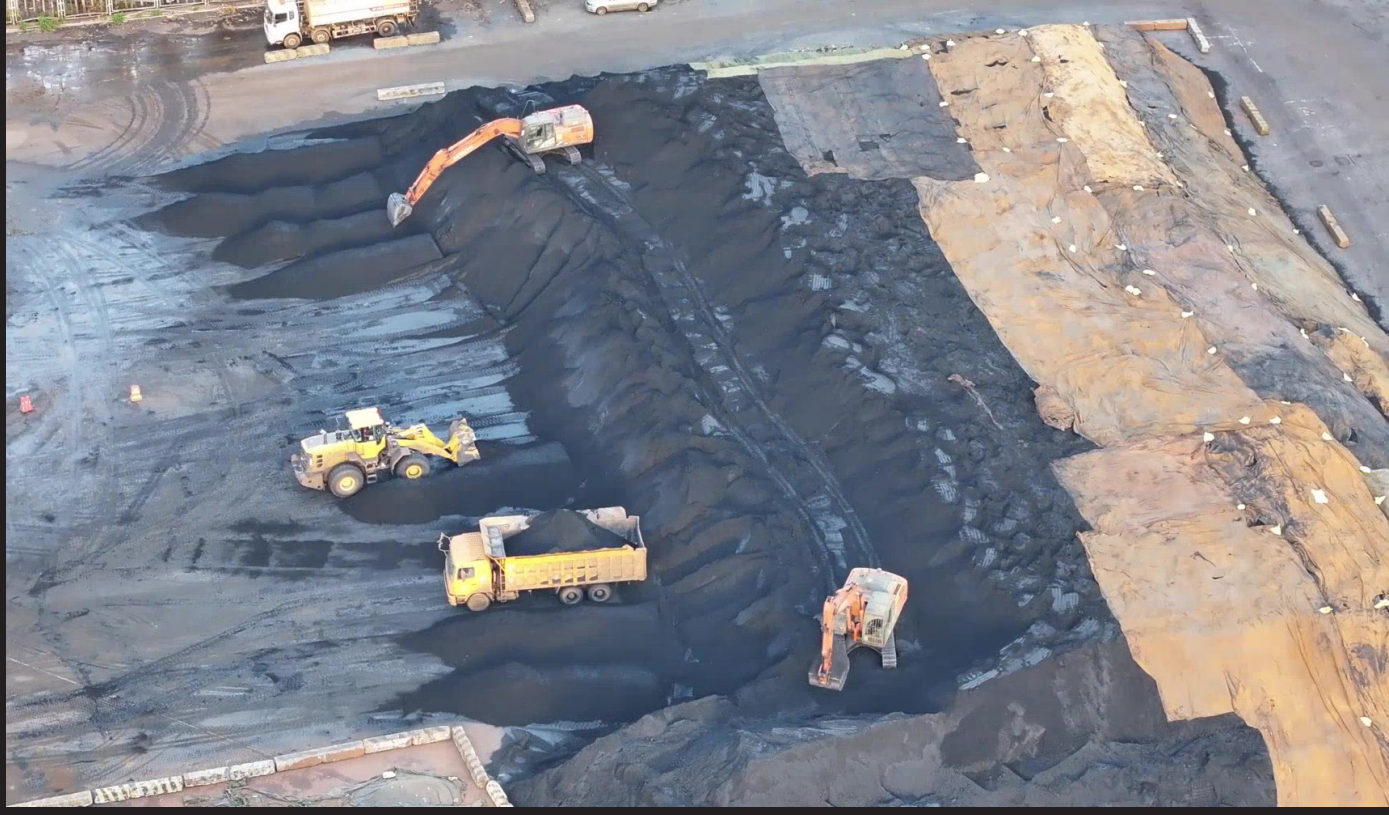


# ESTIMATED LAND REQUIREMENTS

- Mining and processing facility footprint: 300 hectares
- Buffer zones, access roads, and utilities: 200 hectares
- Total land needed: Approx. 500 hectares (5 km²)
- Modular units can be deployed in phases based on mineral targets.

# ENVIRONMENTAL AND TECHNICAL ADVANTAGES

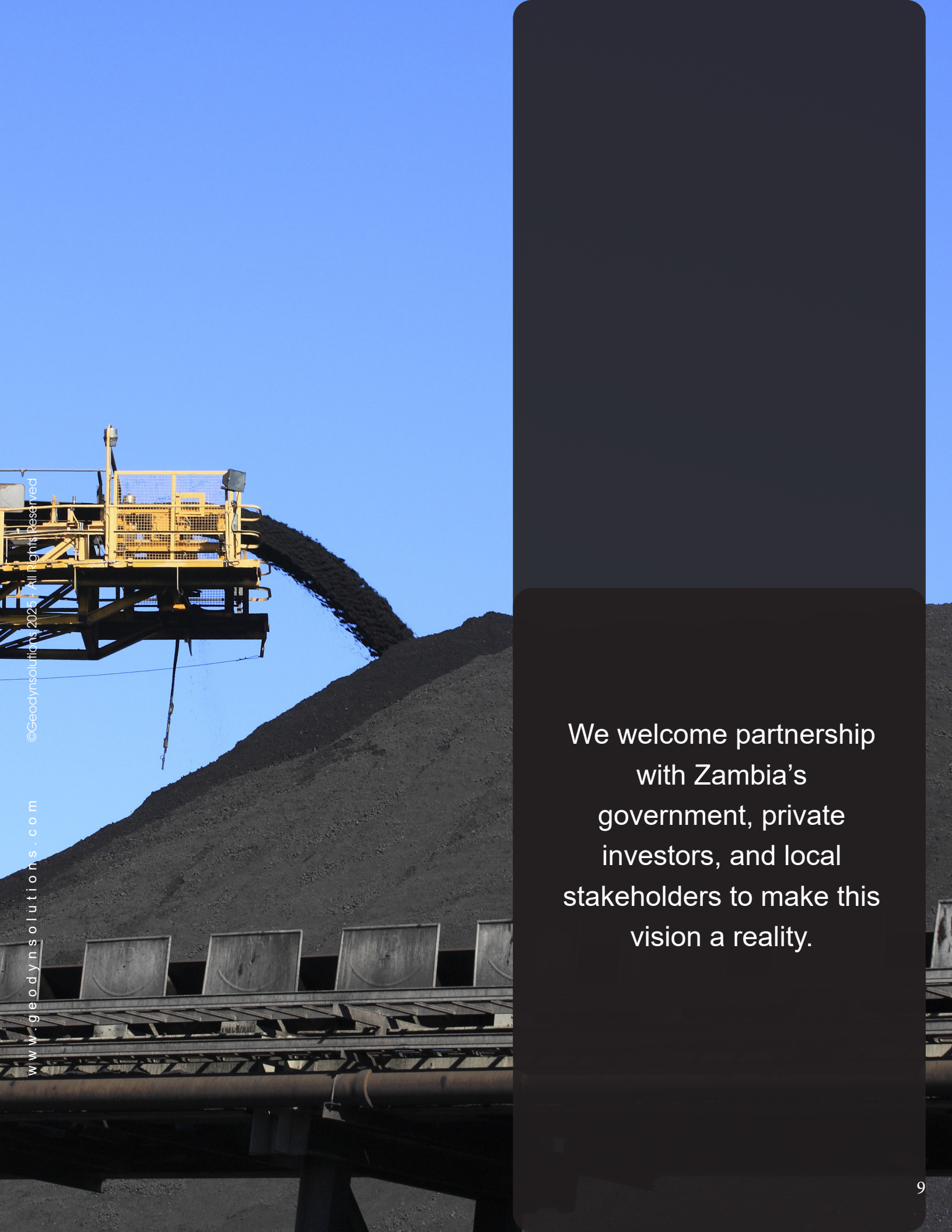

- **Organic Extraction for All Metals:** Reduces the need for toxic chemicals like cyanide and sulfuric acid.
- **Microbial Processing:** Ideal for both primary ores and tailings reprocessing.
- **Mobile Natural Gas Power + ORC:** Supplies reliable off-grid energy (25 MW capacity) while capturing waste heat.
- **Closed-Loop Water Use:** Conserves water and eliminates runoff contamination.
- **Soil Remediation:** Microbial and mycorrhizal treatments restore fertility after mining.



# FEASIBILITY AND STRATEGIC BENEFITS

- **Scalability:** The project is engineered to expand to gold, silver, and copper extraction using shared facilities and organic leaching methods.
- **Government Alignment:** Strong policy support for critical mineral development and sustainable mining practices.
- **Job Creation:** Over 3,000 jobs during construction and 1,200 in ongoing operations; indirect benefits to over 8,000 workers.
- **Export Readiness:** Locations are connected to roads, railways, and ports (via Dar es Salaam or Beira corridors).
- **Community Engagement:** Land-use planning includes benefits to local communities through training, infrastructure, and social programs.

This project represents a transformative opportunity for Zambia to lead the way in sustainable mining, not only for rare earth elements but also for gold, silver, and copper. With abundant resources, environmentally safe technologies, and a flexible energy system, Geodyn Solutions is ready to support Zambia’s rise as a global supplier of critical and precious minerals—while protecting the environment and empowering communities.



We welcome partnership with Zambia’s government, private investors, and local stakeholders to make this vision a reality.

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