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MINDS FOR MINES

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Mandela Mining Precinct

A programme of the Department of Science and Innovation and Minerals Council South Africa; co-hosted and managed by the CSIR and the Minerals Council South Africa.

Expression of Interest (EOI)

For

The Identification of Research Partners for the SAMERDI Programme

EOI No. EOI MMP 16 January 2024

Date of Issue: 16 January 2024

Deadline of Submissions: 23 February 2024 16:00

Enquiries: Enquiries@mandelaminingprecinct.org.za

TECHNICAL INFORMATION

INTRODUCTION

The Mandela Mining Precinct is pleased to announce an **Expression of Interest Call** for the **Identification of additional Collaborative Research Partners for the** South African Mining Extraction Research, Development & Innovation (SAMERDI) **Programme for 2024**. Applicants are requested to familiarise themselves with the information provided in this Call as well as in the SAMERDI Strategy (2015-2025), before preparing an application. The SAMERDI Strategy is available online at https://mandelaminingprecinct.org.za/.

BACKGROUND

The **Mandela Mining Precinct** is funded by the Department of Science and Innovation (DSI) and the Minerals Council South Africa, to maximise the sustainable returns of South Africa's mineral wealth through collaborative research, development, innovation, and implementation of new mining technologies in a socially, environmentally, and financially sustainable manner that is rooted in the local community and national economy. It was established to assist with and coordinate the implementation of the South African Mining Extraction Research, Development & Innovation (SAMERDI) strategy.

The SAMERDI Strategy was adopted at the Mining Phakisa as a basis for the revitalisation of South Africa's mining R&D capability and capacity through **collaboration and support** from researchers, scientists, and engineers. The strategy provides a roadmap on how to work collectively towards technological solutions that will enhance health & safety, increase productivity, and reduce working costs to ultimately extend the life of mines and build the local mining supply chain.

The vision of the SAMERDI strategy is ***"to maximise the sustainable returns of South Africa's mineral wealth through collaborative research, development, innovation & implementation of mining technologies in a socially, environmentally and financially sustainable manner that is rooted in the local community and national economy."***

The SAMERDI implementation programme comprises the following five programmes:

- **Longevity of Current Mines** (LoCM) – Designed to increase the efficiency of ore reserve extraction, improvement in Occupational Health and Safety, extension of the life of mines and the reduction in costs of current conventional mining operations.
- **Mechanised Mining Systems** (MMS) – Aimed at providing sustainable mechanised drill, blast, and mechanical rock breaking solutions in advancement to facilitate achieving zero harm, whilst maintaining and defending desired production rates at minimised costs, within the Au, and PGM mining industries.
- **Successful Application of Technologies Centred Around People** (SATCAP) - The aim of the SATCAP Programme is to understand the challenges, effects and impacts of mining modernisation on people in the minerals sector. Aligned to this aim, the SATCAP Programme has a journey map, which depicts the research plan, with phases, which is poised towards its 2030 vision.
- **Real Time Information Management Systems** (RTIMS) - Aims to develop and implement smart connected systems for mining from sensor to dashboard.
- **Advanced Orebody Knowledge** (AOK) – Aims to create the ultimate' 'Glass Rock'' environment which includes improving geological confidence ahead of the working face, reduction or identification of risks associated with geology and to have timeous information.
- **Test Mine –** an underground test facility is planned to be established to assist with the creation of infrastructure for developing and testing mining technologies, and for industrial training.

These programmes contribute (collectively and individually) to the following criteria of:

- Increasing the competitiveness of the industry.
- Creating new industries; and
- Allowing for technology localisation.

The programmes operate in a collaborative way, utilizing the skills and expertise of several research partners that comprise universities and research institutions. This EOI has a focus on increasing this pool of research partners specifically for the area(s) indicated in Annexure A. The research conducted in each Programme is completed through projects that are undertaken collaboratively by teams of researchers, from the identified research partners. These projects are allocated to research partners based on proposals submitted in response to a call for proposals under each programme. They are evaluated by the Programme Managers (PM) based on the criteria specified, and the evaluation outcomes will be presented by the PM to the Technical Steering Committee (TSC) for final approval. The successful partners will then be approached to formally contract with the Precinct.

Specific areas where we require additional capacity from 2024 are reflected in Annexure A.

- **Note 1:** This is purely an opportunity to be considered part of our **pool of potential collaborators and does not guarantee any party contracts**. Contracts are only awarded to successful parties based on the submission and review of the proposals received via this EOI.
- **Note 2:** All appointments and contracting will be done through either the Council for Scientific and Industrial Researc**h** ("CSIR") or Minerals Council South Africa ("Minerals Council").
- **Note 3: Organisations that are already part of the collaborative pool of MMP must not re-apply. This is purely to add additiona**l parties to this group in focussed fields where additional expertise is still required.
- **Note 4:** For projects to be considered **collaborative, there needs to be intellectual input from all parti**es. In addition, there must be s**ome form of support to the project from each party with substantive value attached to the contribution** - whether this is co-funding, provision of capacity/people (funded by that collaborator), technologies, infrastructure, tools, systems etc.,– in other words, all parties bring something to the table and have "skin-in-the-game". Proposals must therefore indicate what each party contributes to the project/programme or work - package a**nd what the value of this contribution is**.

INVITATION FOR EXPRESSION OF INTEREST

Expressions of interest are invited from suitably qualified institutions, based on the evaluation criteria below. The aim is to increase the number of Research Institutions for collaboration in the mining-related research projects. Only institutions with relevant capacity, expertise, experience, resources, and necessary facilities /equipment will be considered.

EOI SPECIFICATION

All applications are to be submitted in the format specified in this document. However, applicants are welcome to submit additional / alternative information over and above the originally specified format. Providers must provide the information for the following criteria/format and provide proof thereof:

- *Organisation's demonstrated relevant experience* - Years operating or conducting applied research in the mining or mining-related/applied industry.
- *Organisation's relevant skills, expertise, and broad capabilities;* The size, nature and depth of the team consisting of at minimum, a contracts/project manager with at least 10 years' experience in the mining discipline, as well as relevant technical resources in the relevant field.

- *Organisations record of accomplishment in relevant field:* i.e., list of previous projects in the mining or mining-related/applied industry.

NOTE: To be added to the Mandela Mining Precinct database, your institution needs to be registered on the National Treasury Central Supplier Database. We urge all respondents to register on this system as soon as possible, so that the administration process and potential contracting can be completed timeously. Registrations can be completed online at www.csd.gov.za.

ELIGIBILITY

Researchers from South African Universities and Science Councils, and other public or private research institutions and equipment suppliers, working in relevant disciplines, are invited to submit an **Expression of Interest Proposal**. Principal Investigators (PI)/Lead Experts must be qualified to do the proposed research and should be experts in the subject matter referenced in the SAMERDI strategy and programmes.

The evaluation of technical requirements of the EOI will be based on the requirements listed in the table below:

Requirement	**Acceptance Criteria**	**Weight**	**Score**	**Weighted score** **Score*weight**
Demonstrated relevant experience in the mining /applied mining/mining-related /ICT/Digitalisation/IIoT domain and related services/products/solutions or domains	>10 years mining/domain experience – 10 points. 8-10 years – 8 points 6-8 yrs.- 6 points 1-5 yrs. – 4 points	20%		
Relevant skills, expertise, and broad capabilities (latter also includes facilities and equipment)	Full team clearly has the qualifications, skills, and capabilities aligned with Precinct's mining, research and solutions requirements, including strong engineering skills. 100% fit - 10 points 75% fit with requirements- 8 points. 50% partial fit with requirements- 5 points Tenuous fit- 3 points	40%		
Record of accomplishment in relevant field - list of previous projects in the Mining/applied Mining/ IT/Digitalisation/IIoT or another mining-related domain.	References and/or proof of relevant research expertise by providing a list of at least 5 similar projects in a similar field with a minimum of 5 contactable references has been provided, OR a minimum of 5 letters from clients (on their letterhead) stating that the organisation has performed work of this nature. 10 points. 3-4 References and/or proof- 10 points < 1-2 References /proof – 5 points	20%		
Indication of the contribution the collaborator believes they can add to the project and its perceived monetary value.	Contribution /value substantive and considered to be a significant contribution (10 points) Contribution /value sufficiently substantive to qualify (5 points) Contribution /value not substantive (0 points)	20%		
TOTAL		**100%**	**30**	**10 (max)**

Expressions of interest with functionality / technical points of less than the pre-determined minimum overall weighted percentage of **70 %** (i.e., 7/10) and less than **50 %** on any of the individual criteria will not be considered i.e., 5/10 per individual category)

ELIMINATION CRITERIA

Submissions will be eliminated under the following conditions:

- Submission after the deadline (without prior approval).
- Proposals submitted at incorrect Email address.
- Submissions from restricted suppliers in line with Treasury Regulations.
- Submission with incomplete documentation.
- No substantive contribution evident.

CONTRIBUTION BY COLLABORATOR

Indication of the contribution the collaborator believes they can add to the project and its **perceived monetary value**, must be included in the application.

Description of contribution	Value of such contribution (R)

TERMS AND CONDITIONS

PROPOSAL SUBMISSION

To be eligible for consideration, proposals must be submitted in MS Word or PDF format, and must be submitted via email to **Enquiries@mandelaminingprecinct.org.za** no later than the closing date, between the business hours of 08h00 and 16h30. Late submissions will not be considered, under any circumstances.

RESERVATIONS

The CSIR and/ or the Minerals Council expressly reserves the following rights:

- To reject all or any submissions
- To waive any or all irregularities in the submissions submitted
- To retain the right not to select any application/s even if all the requirements are met.

CONTRACT NEGOTIATIONS

The successful applicant/s will be required to enter into a written Agreement with either the CSIR, who hosts the publicly funded projects of the Mandela Mining Precinct on behalf of the DSI, or the Minerals Council, where projects are funded by the Minerals Council.

CLOSING DATE

Applications must be submitted electronically via email to **Enquiries@mandelaminingprecinct.org.za**. The deadline for the submission of EOI proposals is **Thursday, 08 February 2024 by 16:00**

All applicants will be notified about the outcome of their proposals by **28 February 2024** to allow them to participate in the bids and proposal submissions associated with the contracts for 2024/25 financial year.

VALIDITY

All applications will be regarded as valid for 120 days from the opening date, whereafter the CSIR/ Minerals Council may request an updated application, should this become necessary.

DISCLAIMER

This EOI is an **expression of interest only** and not an offer or contracting document. Responses to this EOI must not be construed as acceptance of an offer or imply the existence of a contract between the parties. By submission of its proposal, applicants shall be deemed to have satisfied themselves with and to have accepted all Terms & Conditions of this EOI. The CSIR and/or the Minerals Council make(s) no representation, warranty, assurance, guarantee or endorsements to applicants concerning the EOI, whether regarding its accuracy, completeness or otherwise and the CSIR and/or Minerals Council shall have no liability towards the applicant or any other party in connection therewith.

GUIDELINE FORMAT FOR PROPOSAL

- Name of institution/company and all relevant contact information
- Broad statement of capabilities that will enable the panel to determine level of fit with SAMERDI strategy/programmes.
- SAMERDI Programme Area of focus.
- Comprehensive information on how organisation meets stated requirements.
- Confirmation of registration on National Treasury's Central Supplier Database.

Requirement	**Information provided to substantiate requirement**
Demonstrated relevant experience in the Mining /applied Mining/mining-related /ICT/Digitalisation/IIoT domain and related services/products/solutions or domains. *Years operating/conducting applied research in the Mining or mining-related/applied industry.*	
Relevant capacity w.r.t. skills, expertise, and broad capabilities (latter also includes facilities and equipment) *Give the size, nature, and depth of the team; contracts/project manager with at least 10 years' experience in the mining discipline, as well as relevant technical resources in the relevant field.*	
Record of accomplishment in relevant field - list of previous projects in the Mining or mining-related/applied industry.	
Submit any other additional / alternative information that you believe to be relevant	

Indication of the contribution the collaborator believes they can add to the project and its **perceived monetary value.**

Description of contribution	**Value of such contribution (R)**

ANNEXURE A: SPECIFIC AREAS WHEREIN WE SEEK COLLABORATORS AND CAPACITY.

RTIMS

- The provision of data sets pertaining to production, safety, asset management, security, and or other as proposed, for data mining in the Open Data Analytics Platform (enabling machine learning). This includes pattern recognition and 'data spaces' (see IIC frameworks).
- Technologies that allow production/asset management data to be converted into usable information (which may include visual) with limited interpretation or interference by the user.
- Capacity/capability to construct and optimize models in Erwin Evolve Process engineering software/systems.
- Capacity/capability to manage systems design/engineering software (Cradle SE).
- Enhance the RTIMS IIoT for Mining Framework with plug-in systems and technical information.
- Best of class Data Orchestration / Management / Governance for large data sets.
- Best of class Cyber Security / Resilience / Risk Management Practices for SA Mines

Longevity of Current Mines (LoCM) Programme

- Seeking manufacturers with capability and capacity of hydrogens solutions offerings for alternative energy storage / powering in the mining industry (Future sustainable mining)
- Seeking enablers to conduct testing of mining equipment prototypes/products for TRL6 stage gate assessments at the Test Mine in the underground workings (Equipment testing and TRL6 validation and certification)
- Collaborating partners with existing software, hardware and digital measuring and reporting systems to measure the following:
    - Drill holes: drill information, e.g. dimensions, length, direction, volume, rock properties information, e.g. Uniaxial Compressive Strength (UCS), Tensile Strength (T S), Abrasiveness, Young's Modulus (E), Brittleness
    - Charging: measured explosive quantities during charging, emulsion mix ratio, actual vs required, calculated % charged volume from measured volume.
    - Blasting: electronic central initiation system, fault detection and reporting, location of potential misfires.
- Seeking enablers who can do a full conceptual design of an industry dynamic test facility.
- Seeking enablers who can design a Technical Readiness Level (TRL) process system between TRL6 and TRL9 where products are developed from prototypes which passed the TRL6 stage gate.

Mechanised Mining Systems (MMS) Programme

- Collaborator partners with capability to conduct Texan numerical modelling of stiffness of the loading system which verify back analysis results from underground mined areas (**Rock Engineering Pillar Design (Phase IV).**
- Collaborator partner with capacity and capability to establish TRL6 testing requirements and processes, testing independently the prototype/product and validate / certificate the product achieving proof of concept TRL6 stage. Also developing TRL processes for Human Capacity / Capability readiness levels aligned to the TRL process (**Non-explosive rock breaking equipment testing and TRL 6 assessment)**.
- Seeking enablers with capacity and capability to establish mechanical design framework and guidelines for the mechanical rock cutting prototype / product development for narrow reef hard rock mines applications

- Seeking enablers to conduct testing of mining equipment prototypes/products for TRL6 to TRL9 stage gates at an operational mine in the underground workings (**ULP equipment testing / verification)**.
- Seeking enablers to conduct testing of mining equipment prototypes/products for TRL6 to TRL9 stage gates at the Test Mine in the underground workings (**Testing and demonstrating mining equipment with autonomous level 2 capabilities)**

SATCAP

- Providers with completed and/ or existing ESG mining-related case, pilot, and impact studies; and including existing technologies to support the understanding and measuring of:
    - Social-related impacts in mining modernization
    - Environmental, social and governance (ESG) impacts in mining modernization
    - Community impacts in mining modernization
    - Jobs and skills impact in mining modernization

Test Mine

- Access control technology for all areas of the mine, multiple employees should be able to clock IN or OUT.
- Blocking / allowing of certain IP addresses, ensuring that employees can only clock from approved locations.
- Automated Scanning of employees as they enter the shaft area to enable a shaft clearance report.
- Technologies that can capture the health status of the employee.

AOK

- Technologies that can obtain face grade (Gold and PGM specific) in the underground environment.
- Mapping and scanning technologies/hardware/software to see into and around the rock face which can include photogrammetry, laser scanning, thermography, radar, acoustic sounding, hyperspectral sensing.
- Technologies/hardware/software that can capture geological/geotechnical information in real time for a 3D geological model.
- Technologies that allow Geotechnical/geological data to be converted into usable information (which may include visual) with limited interpretation or interference by the user.
- Deployment platforms whereby equipment such as scanners and cameras can be positioned for data collection, ultimately to remove personnel from the mining face while data is being collected.
- Solutions to making equipment, sensors, scanners etc. intrinsically safe for metalliferous mines.