

Minutes of 20th PERC (Project Evaluation & Review Committee) meeting held under the Chairmanship of Shri Satendra Singh, Joint Secretary, Ministry of Mines during 23-25 Nov 2020 through VC. The list of participants is enclosed in Annexure-A.

1. During the current year project proposals were invited online under the Science & Technology Scheme of Ministry of Mines. A special feature of this year is that a new portal dedicated to the scheme, viz. SATYABHAMA portal (research.mines.gov.in), was launched by Hon'ble Minister of Mines and the new project proposals were received through this portal.

2. A total number of 383 project proposals were received online on the portal. A two-stage review process was adopted to evaluate the proposals for recommendation to Standing Scientific Advisory Group (SSAG). The first stage comprised of preliminary screening of the proposals done by a team of experts constituted by Ministry of Mines. Based on the guidelines as adopted in 14th PERC, the experts conducted pre-screening of the proposals. After screening, 102 proposals covering five areas, namely (i) Geosciences and Exploration (ii) Mining (iii) Mineral Processing & recovery from waste (iv) Metal Extraction (Metallurgical processes) and (v) Alloys, specialty materials and product; were short listed for further review in the second stage. Since there were a large number of project proposals to be evaluated by the committee, the committee was split into 3 groups as per their expertise on the various thrust areas, viz. (a) Mining (b) Mineral Processing and (c) Metallurgy. Due to the ongoing COVID-19 situation in the country, all the members and PIs attended the meeting through Video Conferencing mode. These 102 project proposals were presented by the respective Principal Investigators (PIs) and evaluated by the committee during the VC meeting held on 23-25 Nov 2020. In addition to the above, 38 ongoing projects were reviewed by the committee. As per the terms of reference of PERC, the concerned members recused themselves, to avoid conflict of interest, from the proceedings from that part of the meeting when project(s) related to their institute(s) was under consideration.

3. The following criteria were given to all experts for detailed evaluation.

- (i) Is the problem well defined?
- (ii) Does the proposal adequately cover prior work both in the institution and elsewhere? Is it similar to any earlier work already sanctioned; has the PI done prior work to prove proof of concept before submitting the project or is the project in the early stage itself
- (iii) Does it address a critical gap in our country's needs and requirements
- (iv) Is the methodology of work well laid out and doable.
- (v) Are the deliverables well defined
- (vi) Is there a translational potential for application / user interface; Can it move to higher TRL?
- (vii) Does the PI and institution have adequate competence to do the proposed research
- (viii) Is there collaboration with another Lab or institution or industry to enhance the quality and quantum and application potential
- (ix) Budget: Is the budget correctly done; Is there deficiency or excess
- (x) Time duration:
- (xi) Any other comments.

The 3 panels met together at the end and selected the projects for recommendation to the next level SSAG, or asked the PIs to revise and attempt a resubmission to the next PERC or not recommended at all. The details are given in the succeeding paragraphs.

Final recommendation to SSAG

- (i) Recommended with or without changes to SSAG: **28 Project Proposals**
- (ii) To be revised and resubmitted in next PERC: **6 project Proposals**
- (iii) NOT recommended: **68 Project Proposals**
- (iv) Review of ongoing projects (**38**)

4. Based on the detailed review and evaluation, the following new project proposals are being recommended to SSAG. *The details of recommended projects and specific recommendations are given hereunder:*

RECOMMENDED- 28 nos.

1.	
Project No.	<u>SNTMOM/10/2020</u>
Project Title	Studying, modelling and evolving a new blasting technique for open cast mine excavations near the proximity of structures (beyond 50 m) using the structural response analysis and dynamic FEM
Institution	CSIR Central Institute of Mining and Fuel Research
Principal Investigator	Aditya Rana 9694641232 adityarana.nitjaipur@gmail.com
Project Cost & Duration	Rs. 3821076.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • Manifesting a methodology encompassing modelling and controlled blasting for extraction of minerals nearby structures. • To provide strong technical justification for open-cast mine blasting beyond 50 m from nearby structures. • To develop blast designs and technique for maximum possible extraction of abandoned minerals and coal beyond 50 m from nearby structures in open-cast mines without compromising safety of structures. • Adjudging the adequacy of conduit blasting technique for blasting nearby structure. • Studying and predicting the dynamic response of structures in the vicinity of blasting area using finite element tools and accordingly recommending the blast designs.
REMARKS/SUGGESTION:	
RECOMMENDED	
<ol style="list-style-type: none"> 1. Panel appreciated the proposed work. 2. The work supports the idea of Atmanirbhar Bharat 3. The proposed work will enable locked up areas to be worked in proximity to structures and financially benefit the mining sector. There will be technological advancement in understanding near field vibrations from surface blasting 	

4. The Project coordinator may send in the next three months, the location of structures and mines in consideration in the Project, in a Map of India with enlarged maps of the States in which the work is supposed to be done.

2.	
Project No.	<u>SNTMOM/14/2020</u>
Project Title	Recovery of copper from water bodies nearby copper mines using microbial electrochemical systems
Institution	Indian Institute of Technology ISM Dhanbad
Principal Investigator	Vipin Kumar M : 9471191352 E-mail : vipinmicro1@iitism.ac.in
Project Cost & Duration	Rs. 3599200.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> To measure the physico-chemical properties including concentration of copper and other metals in the tailing pond water and waste water. To design the economic microbial-electrochemical reactor for maximum metal recovery from mining waste water discharged. To optimize the microbial community for selective reduction of the Cu, operating conditions and limiting factors for the copper reduction in the microbial-electrochemical system.

REMARKS/SUGGESTION:

RECOMMENDED WITH MODIFICATION

1. Preliminary work has been done by PI
2. PI should submit a fresh letter from Hindustan Copper Limited.
3. Recovered copper should be given back to HCL.
4. Project duration should be 18 months with a revised cost of Rs. 25 Lakhs.
5. PI should provide the name of mine for selected tailing.

3.	
Project No.	<u>SNTMOM/47/2020</u>
Project Title	Corrosion and wear resistant advanced coatings based on high entropy alloys for mining equipments
Institution	Indian Institute of Technology Delhi
Principal Investigator	Jayant Jain E-mail: jayantj@iitd.ac.in

Project Cost & Duration	Rs. 2755200.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> To prepare a robust coating of AlCoCrFeNiTi_x (x=0, 0.5, 1 and 1.5) high entropy alloy with low porosity and excellent bonding strength by high-velocity-oxygen-fuel (HVOF) thermal spraying technique. To investigate the microstructural behaviour of the AlCoCrFeNiTi_x (x=0, 0.5, 1 and 1.5) HEA coatings by optical microscope, scanning electron microscope, energy dispersive spectroscopy, XRD and AFM. To investigate the wear behavior AlCoCrFeNiTi_x (x=0, 0.5, 1 and 1.5) HEA coating by scratch and pin-on-disc tests. To investigate the corrosion behaviour of AlCoCrFeNiTi_x (x=0, 0.5, 1 and 1.5) HEA coatings by immersion and potentiodynamic polarization tests. Evaluation of wear and corrosion mechanisms associated with newly developed HEA alloy coatings.
REMARKS/SUGGESTION: RECOMMENDED WITH MODIFICATION	
<ol style="list-style-type: none"> Project is well conceived with adequate preliminary work and objectives. Project is recommended for approval for a revised budget cost of Rs. 24 Lakhs with a duration of 2 years. 	

4.	
Project No.	<u>SNTMOM/52/2020</u>
Project Title	Design, analysis and development of Rheo gravity die cast Al-15Mg2Si-4.5Si composite based light weight Bucket links for Mining Excavators
Institution	CSIR Central Mechanical Engineering Research Institute
Principal Investigator	Prosenjit Das M: 9531590074 E-mail: prosenjit@cmeri.res.in
Project Cost & Duration	Rs. 7270950.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> Design and development of the Rheo gravity die casting set-up. Development of hypereutectic Al-15Mg2Si-4.5Si composite, with suitable alloying addition such as; Sr, B etc., following Rheo gravity die casting technique. Composite composition i.e, percentage of alloying addition will be optimised based on desired values of mechanical, tribological properties required for the development of "H link and side link" of mining excavator. Development of comprehensive experimentally validated multiphase flow Computational Fluid Dynamics (CFD) based numerical models of (i) semi-solid slurry production, and (ii) solidification of the proposed composite. Development of Constitutive model for the novel Al-Mg2Si-Si

	<p>composite and Finite element analysis of deformation, fracture behaviour (macro and micro scale) of the developed composite under tensile and fatigue loading.</p> <ul style="list-style-type: none"> • Design and development of prototype "H link and side links of mining excavator", out of the proposed MMC.
<p>REMARKS/SUGGESTION: RECOMMENDED WITH MODIFICATION</p> <ol style="list-style-type: none"> 1) Objective and deliverables well defined. 2) CFD modelling should be in background activities. 3) Should undertake die designing and equipment making in the first year. 4) Project should be completed in 2 years with a revised budget of Rs. 55 Lakhs. 5) Project should lead to product development with appropriate product sizing. 	

5.	
Project No.	<u>SNTMOM/73/2020</u>
Project Title	Development of Empirical Methodology for Design of Crown Pillar during transition from opencast to underground mining for Indian Mines
Institution	CSIR Central Institute of Mining and Fuel Research
Principal Investigator	Chandrani Prasad Verma 9422477144 chandrani@cimfr.nic.in
Project Cost & Duration	Rs. 3789850.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • To understand the influence of various design parameters on crown pillar stability through numerical modelling • To analyse crown pillar behaviour under different geominig condition and to understand the failure mechanism of such pillar through physical modelling • To optimise the amount of ore being locked up in crown pillar and • To develop an optimum design methodology for crown pillar design under different geominig condition.
<p>REMARKS/SUGGESTION: RECOMMENDED</p> <ol style="list-style-type: none"> 1. The proposed work is innovative. 2. The deliverables can be useful for mining sector. 	

6.	
Project No.	<u>SNTMOM/90/2020</u>

Project Title	Determination of optimum safe distance of toe of dump from crest of open pit for stability of pit slope under different geo-mining conditions
Institution	CSIR Central Institute of Mining and Fuel Research
Principal Investigator	Sanjay Kumar Roy 9471192140 sanjaykroy.cmri@gmail.com
Project Cost & Duration	Rs. 8703560.0 3 yrs
Objectives of the project	<ul style="list-style-type: none"> • effect of different benching configurations, like bench height, bench width, overall height of dump, overall depth of pit, overall slope angle of pit, overall slope angle of dump, angle of repose, cohesion, angle of friction, lithology, structural discontinuities, presence of weakness planes etc. on the factor of safety of pit slopes and dump slopes • To determine the effect of distance of toe of overburden dumps from the crest of the open pit on the slope stability of pits and dumps under different geo-mining conditions • To find out optimum safe distance of toe of overburden dump from the crest of the open pit on the slope stability of pit under different geo-mining conditions
REMARKS/SUGGESTION:	
RECOMMENDED WITH MODIFICATION	
<ol style="list-style-type: none"> 1. Dumps instability is an issue and further work is required in this area. 2. Work is very much needed for Indian mining industry. 3. The project is recommended with revised budget of Rs.52 Lakhs for 2 years 	

7.	
Project No.	<u>SNTMOM/91/2020</u>
Project Title	Development of Ready-To-Use Assorted Sand for Construction Activities from Zinc Refining Wastes and Marble Powder
Institution	MANIPAL UNIVERSITY JAIPUR
Principal Investigator	Bhavna Tripathi 9460383678, bhavna.tripathi@jaipur.manipal.edu
Project Cost & Duration	Rs. 5066585.50 2 Yrs, 6 Months
Objectives of the project	<ul style="list-style-type: none"> • This project aims to evaluate the engineering properties of artificial construction sand developed under the project entitled “Development

	<p>of Ready-To-Use Assorted Sand for Construction Activities from Zinc Refining Wastes and Marble Powder” vide sanction order Met4-14/16/2018 – Metal IV/ Record Cell dated 28.09.2018. PI was given funds for one year for demonstrating proof of concept. PI has successfully developed artificial sand and a patent application no. 202011035875 has been filed. Therefore, following objectives are proposed under the present proposal:</p> <ul style="list-style-type: none"> • To use Jarosite for preparing artificial sand with waste marble powder. • To evaluate the engineering and durability properties of concrete prepared using ready-to-use assorted sand in comparison with control mixes. • To study the environmental suitability and microstructural properties of concrete prepared by using ready-to-use assorted sand in comparison with control mixes.
<p>REMARKS/SUGGESTION: RECOMMENDED WITH MODIFICATION</p> <ol style="list-style-type: none"> 1. New innovative concept. 2. Considering the scarcity and rampant illegal mining of sand it is the need of the hour. 3. Research topic is advantageous from environment point of view. 4. Recommended with revised project cost of Rs. 30 Lakhs for 2 years. 	

8.	
Project No.	<u>SNTMOM/123/2020</u>
Project Title	Preparation of synthetic zircon from zircon minerals of beach sand, its characterization and value addition as thermal and electrical insulator
Institution	SOCIETY RAMAN EDUCATION
Principal Investigator	SUNITA ROUSTRAY M: 7327847963 E-mail: sroustray1@cvrce.edu.in
Project Cost & Duration	Rs. 3183200.00 3 Yrs
Objectives of the project	<p>The objective of the project proposal is</p> <ul style="list-style-type: none"> • To prepare zirconia nano materials from zircon minerals of Beach sand. • To prepare composite tetragonal zircon or synthetic zircon from zirconia nano materials and fumed silica. (The tetragonal phase is stable at temperatures between 1170-2370 °C.) • To establish the use of synthetic zircon as thermal insulator. • To establish the use of synthetic zircon as electrical insulator in switch gear protection equipment.
REMARKS/SUGGESTION:	

RECOMMENDED WITH MODIFICATION

1. PI informed that she has undertaken a project on assessment on distribution of heavy minerals sanctioned by SERB, Dept. of Science & Technology in 2017.
2. Project idea is good
3. Recommended for approval with a seed money of Rs. 10 Lakhs for establishing proof of concept within one year.
4. PI was suggested to remove beneficiation part and take fresh zircon sample and come up with only one application.

9.	
Project No.	<u>SNTMOM/125/2020</u>
Project Title	Geo-technological evaluation of Bauxite and Laterite deposits of Chhattisgarh State by using Geospatial technology under Smart Mining 4.0
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre
Principal Investigator	Pravin G Bhukte 9960020724, 9527916756 pgbhukte@jnarddc.gov.in
CO- PI	
Project Cost & Duration	Rs. 6652100.00 2 Yrs
Objectives of the project	<ul style="list-style-type: none"> • The project work is proposed to be carried out in close co-operation of organizations viz. JNARDDC and Chhattisgarh Council of Science & Technology, Chhattisgarh. The following objectives laid down for this project. • Geo-technological evaluation of Bauxite and Laterite deposits of Chhattisgarh State under Smart Mining 4.0 programme • Creation of district wise digital database of laterite and bauxite deposits for Chhattisgarh State using geo-referenced cadastral maps and high-resolution satellite imageries
REMARKS/SUGGESTION:	
RECOMMENDED WITH MODIFICATION	
<ol style="list-style-type: none"> 1. The digital database will be useful for miners 2. The outcomes will be useful in state govt mining auction process. 3. Recommended with revised budget of Rs. 45 Lakhs. 4. The name of the concerned person of CCOT, Chhattisgarh should be included in the proposal along with role of both JNARDDC & CCOT. 	

Project No.	<u>SNTMOM/141/2020</u>
Project Title	Development of low cost filler material utilizing Lithomargic clay for paint industry as per IS 68 2006 standard
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre
Principal Investigator	Pravin G Bhukte M: 9960020724 E-mail: pgbhukte@jnarddc.gov.in
Project Cost & Duration	Rs. 5533600.00 2Yrs
Objectives of the project	Objective To utilize Lithomargic clay for development of low-cost filler material for paint industry as per IS:68 (2006) standard To validate product (filler) as per norms of Indian standards for paint industry.
REMARKS/SUGGESTION: RECOMMENDED WITH MODIFICATION	
<ol style="list-style-type: none"> 1. Concept was appreciated 2. Objective and deliverables well defined leading to product development 3. Recommended for approval with a revised budget of Rs.45 Lakhs. 	

11	
Project No.	<u>SNTMOM/169/2020 (SNTMOM/269/2020)</u>
Project Title	Fabrication of Al ₂ O ₃ containing cellulose based Ag NPs encapsulated Collagen dressing and investigation of its Therapeutic Opportunities in Diabetic Wound Healing
Institution	Kalinga Institute of Industrial Technology & JNARDDC, Nagpur
Principal Investigator	AMRITA MISHRA E-mail: amrita.mishra@kiitbiotech.ac.in Mb. No. 8763354811 SUCHITA B. RAI (Jawaharlal Nehru Aluminium Research Development and Design Centre)
Project Cost & Duration	Rs. 1688400.00 Duration: 3 Yrs, 0 Mth)
Objectives of the project	<ul style="list-style-type: none"> • To synthesize Al₂O₃/AgNPs/Collagen/Cellulose device (Ag NPs encapsulated collagen matrix will be embedded on cellulose paper) and their characterization. • To investigate antibacterial, antibiofilm and possible molecular mechanism of Al₂O₃/AgNPs/collagen/cellulose device against

	<p>pathogenic antibiotic resistant and non-resistant S. aureus and P. aeruginosa.</p> <ul style="list-style-type: none"> • To check the activity of oxidative stress associated factors and expression of important genes will be evaluated using different molecular approaches. • To investigate biocompatibility of Al₂O₃/AgNPs/Collagen/Cellulose device under normal and hyperglycemia conditions towards mammalian cells followed by in vitro methods. • Al₂O₃/AgNPs/Collagen/Cellulose device will be used to evaluate the wound healing proficiency and elimination of infection caused by pathogenic bacteria in diabetic and non-diabetic mice (BL6 or BALB-c).
<p>REMARKS/SUGGESTION: RECOMMENDED WITH MODIFICATION</p> <ol style="list-style-type: none"> 1) Silver nanoparticles from natural source and hyper accumulation idea is good but concurrently should use synthesis from Ag Nitrate solutions; KIIT may immediately start with available nano alumina and later on take in JNARDDC materials. 2) Objectives and deliverables well defined leading to product development. 3) Precipitation route should identify the proper particle size. 4) Compare it with commercially available wound dressing products. 5) PI informed that project was submitted twice on online portal vide no. 169 & 269 for including the correct budget and collaborator details. 6) Total project budget should be pruned to Rs. 30 Lakhs with Rs. 15 Lakhs to KIT, Odisha and Rs. 15 lakhs to the JNARDDC, Nagpur (Collaborator) and project duration should be 2 years. 	

12	
Project No.	<u>SNTMOM/171/2020</u>
Project Title	Design, Synthesis and Fabrication of Donor-Acceptor Based Fluorescent Sensing Organic-Nanomaterials and Devices for Detection and Quantification of Rare Earth Elements in Minerals
Institution	University of Calcutta
Principal Investigator	Dilip Kumar Maiti E-mail: maitidk@yahoo.com Mb. No. 0798061767
Project Cost & Duration	Rs. 7484500.00 Duration: 3 Yrs, 0 Mth)
Objectives of the project	<ul style="list-style-type: none"> • DFT design of complementary CO-NH and NH-CO pair compounds, stacked system, role of p-p interaction and binding with REEs. • Synthesis of paired complementary pyrene analogues and development of their photophysical properties. • Fabrication of organic nanomaterials and their imaging analyses. • Sensing RREs present in aqueous mineral solutions, leachates, industrial waste and suspension of minerals, and finding their selectivity as well as

	quantity. <ul style="list-style-type: none"> Fabrication of innovative devices for detection and quantification of RREs in minerals.
REMARKS/SUGGESTION:	
RECOMMENDED WITH MODIFICATION <ol style="list-style-type: none"> Objectives well defined. Solvent extraction could be a cheaper process is transportable. Deliverables should be cut down. Recommended for approval with a revised budget of Rs. 55 Lakhs for 2 years. 	

13	
Project No.	<u>SNTMOM/230/2020</u>
Project Title	Extraction and isolation of Al, K, Li, Rb and Cs from Mica
Institution	CSIR Institute of Minerals and Materials Technology
Principal Investigator	Barsha Dash E-mail: barsha.dash@gmail.com Mb. No. 9439018460
Project Cost & Duration	Rs. 3013000.00 Duration: 2 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> Development of process flowsheet for the extraction of Al, K, Li, Cs and Rb from Mica Isolation of individual elements
REMARKS/SUGGESTION:	
RECOMMENDED WITH MODIFICATION <ol style="list-style-type: none"> One year is sufficient for carrying out the whole characterization of mica. Mica should be collected from various parts of the country. Concentration of Li and Rb is very high which needs to be checked and cross verified Proper calculation is required for 1 kg of Li extraction from mica source. Proof of concept to be submitted with a revised budget of Rs. 10 Lakhs for one-year duration. If the results are encouraging then phase-2 project proposal for recovery of Li ,Rb and Cs from mica may be submitted. 	

14	
Project No.	<u>SNTMOM/234/2020</u>
Project Title	Development of Process for Making High Pure Quartz or Silica and Metallic Silicon from Low Grade Naturally Occurring Quartz
Institution	CSIR Institute of Minerals and Materials Technology
Principal Investigator	ALOK TRIPATHY M: 9437066723 E-mail: atripathy@immt.res.in
Project Cost & Duration	Rs. 8081000.00 3 Yrs
Objectives of the project	The following are the objectives of the study proposed <ul style="list-style-type: none"> • Development of cost effective process for preparing high purity quartz or silica from naturally occurring low grade quartz • Development of cost effective process for making metallic silicon (Si) from high purity quartz.
REMARKS/SUGGESTION:	
RECOMMENDED WITH MODIFICATION	
<ol style="list-style-type: none"> 1. Objectives and deliverables well defined. 2. PI should target one work element (Metallic Silicon). 3. PI should collect the sample from present exploration being done by GSI. 4. Recommended for approval with aseed money of Rs 15 lakh for one year to characterize quartz sample and establish proof of concept. 	

15	
Project No.	<u>SNTMOM/253/2020</u>
Project Title	Development of India specific scientific framework to promote the beneficial reuse, rehabilitation or remediation of landscape affected by abandoned mines or flyash ponds or slags
Institution	Indian Institute of Technology BHU Varanasi
Principal Investigator	Amit Verma 0778101240 amitvermaism@gmail.com
Project Cost & Duration	Rs. 8319465.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • To develop a framework to facilitate a successful transition to mine closure

	<ul style="list-style-type: none"> To delineate potential uses of abandoned/inactive mines/fly ash ponds across India To study the impact of rehabilitation on alleviating social, economic and environmental wellbeing of communities living in and around major mining centers in various parts of India
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REMARKS/SUGGESTION:

RECOMMENDED WITH MODIFICATION

- The work is related to classification of mine on the basis of criticality.
- It will also determine potential use based on availability of nearby resources
- This database and analysis will help in future sustainability in the vicinity of the mine area
- The framework suggested can be helpful for mine closure plan.
- Responsibility of each organization should be defined and progress of work will be reviewed after 6 months.
- Recommended with revised budget of Rs. 50 Lakhs for 2 years.

16	
Project No.	<u>SNTMOM/273/2020</u>
Project Title	Employing metallurgical silicon to develop new class of silicon composites for structural applications
Institution	Indian Institute of Technology Bhubaneswar
Principal Investigator	Srikant Gollapudi E-mail: srikantg@iitbbs.ac.in Mb. No. 9470996271
Project Cost & Duration	Rs. 4620800.00 Duration : 3 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> To establish a process for utilizing metallurgical silicon for producing silicon composites To demonstrate the utility of silicon composites for structural applications by improving its strength and toughness compared to elemental silicon

REMARKS/SUGGESTION:

RECOMMENDED WITH MODIFICATION

- Project idea is novel and good.
- Attrition mills can be replaced with the ball mill.
- The PI should consider dispersion of other materials such as silica fibres for increasing toughness.
- Dispersion of nano silicon developed should be tried to make aluminium silicon hyper eutectic alloy and benchmark and compare with conventional alloys. Other alloys for automotive castings can also be explored.

5) Recommended with a revised cost of Rs 38 Lakhs for 2 years duration.

17	
Project No.	<u>SNTMOM/282/2020</u>
Project Title	Bioleaching of Lithium from minerals and low grade ores of Indian origin
Institution	CSIR Institute of Minerals and Materials Technology
Principal Investigator	Nilotpala Pradhan M: 0943754083 E-mail: npradhan@immt.res.in
Project Cost & Duration	Rs. 2377200.00 2Yrs
Objectives of the project	Present project would like to attempt to develop a process for bioleaching of Lithium from minerals and low grade ores of Indian origin. Bio-mineral laboratory of CSIR-IMMT has large collection of such microorganisms while working with different minerals under different projects. A microbial process may be used to recover Li from a very low grade ore material where chemical process proves to be too costly and environmentally unsuitable. Objectives of the study are (i) Screening of microorganisms (bacteria and fungi) for their ability of bioleaching of Lithium from low grade ore found in India; (ii) Feasibility of bioleaching of Lithium using microorganisms after optimization of culture conditions with selected microorganisms.
REMARKS/SUGGESTION:	
RECOMMENDED WITH MODIFICATION	
<ol style="list-style-type: none"> Objectives and deliverables well defined. Project recommended for approval with initial seed money of Rs. 13 Lakhs for one year to establish proof of concept. 	

18	
Project No.	<u>SNTMOM/290/2020</u>
Project Title	Production of high pure manganese metal organic frameworks (Mn-MOFs) and their derivatives from low grade manganese ores for supercapacitor applications
Institution	CSIR Institute of Minerals and Materials Technology
Principal Investigator	Bankim Chandra Tripathy

	M: 7978521730 E-mail: bankim@immt.res.in
Project Cost & Duration	Rs. 11038700.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> Utilization of low/lean grade manganese ores for producing energy materials Selective reductive leaching of manganese Preparation of high pure manganese precursors for MOF synthesis Synthesis of manganese MOFs and its derivatives with tunable porosity Investigation of electrochemical performances of MOFs and their derivatives as an electrode material for supercapacitor.
REMARKS/SUGGESTION:	
<p>RECOMMENDED WITH MODIFICATION</p> <ol style="list-style-type: none"> Objective and deliverables are well conceived Recommended for approval with asced money of Rs. 10 lakhs for one year duration to undertake preliminary studies to establish the proof of concept. 	

19	
Project No.	<u>SNTMOM/293/2020</u>
Project Title	Development of Alternative flux Material from Red Mud for Steel Dephosphorization
Institution	CSIR Central Electrochemical Research Institute
Principal Investigator	ANAND BABU G M: 9486339240 E-mail: anandbabu@cecri.res.in
Project Cost & Duration	Rs. 3779920.00 3 Yrs
Objectives of the project	<p>To develop alternate flux material from Red Mud or Bauxite Residue, which can be an economical replacement for lime in the BOF steel making process.</p> <ul style="list-style-type: none"> Assessment of dephosphorization capabilities of the developed flux material This project proposal shall develop an alternative flux from the Red Mud, which can be used as an alternative for calcined lime in the steel making process. Usage of 10kg red mud-based alternative flux in place of lime in steel making applications can consume 1.12 MT of red mud annually. The successful development of the product shall aid in consuming the red mud inventories rapidly. Thereby it can decrease the environmental hazards faced by the Bauxite mining industries. In addition to that, it can create direct and

	indirect employment.
REMARKS/SUGGESTION:	
RECOMMENDED WITH MODIFICATION	
<ol style="list-style-type: none"> 1. Project idea is good 2. Bulk utilization of bauxite residue could benefit the steel industry 3. Recommended for approval with a seed money of Rs. 10 Lakhs for one year duration for establishing proof on concept. 	

20	
Project No.	<u>SNTMOM/295/2020</u>
Project Title	Development of prototype aluminium seat frame for passenger buses.
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre
Principal Investigator	V N S U VISWANATH AMMU E-mail: viswanatha@jnarddc.gov.in Mb. No. 7798546794
Project Cost & Duration	Rs. 14302000.00 Duration :2 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • To design and develop lightweight aluminium seat frame for passenger bus application. • To simulate the die design, die fabrication and extrude the profiles. • To develop and validate the prototype of aluminium seat frame for passenger vehicles as per AIS 023 standard.
REMARKS/SUGGESTION:	
RECOMMENDED WITH MODIFICATION	
<ol style="list-style-type: none"> 1) Project idea is good. 2) Objectives and deliverables well-conceived. 3) Die cost is very high and fabrication part needs to be addressed in the proposal. 4) Recommended with a total revised budget of Rs. 100 Lakhs. (JNARDDC – Rs. 60 Lakhs & ARAI – Rs. 40 Lakhs) 	

21	
Project No.	<u>SNTMOM/330/2020</u>
Project Title	Sustainable ion exchange resin-based technology for rare earth extraction
Institution	Indian Institute of Technology Madras

Principal Investigator	Thalappil Pradeep E-mail: pradeep@iitm.ac.in Mb. No. 9445560767
Project Cost & Duration	Rs. 52.51 Duration : 2 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • Development of sustainable ion exchange resins-based technology to extract REEs • Follow the same methodology for one field sample of relevance to India. Selective extraction of REEs from ores using ion exchange resins involves strong interaction of the metal with specific resins, leading to the uptake of the metal. • In this process, we will use biopolymer-based materials like chitosan, lignin, etc., and functionalise them with specific groups/resins to extract REEs efficiently. • In this context, chitosan and lignin can be functionalised with aminopolycarboxylic acids [e.g. EDDHA (ethylenediamine-N,N'-bis(2-hydroxyphenylacetic acid)), EDDS (ethylenediamine-N,N'-disuccinic acid), EGTA (ethylene glycol-bis(β-aminoethyl ether)-N,N,N',N'-tetraacetic acid), EDTA (ethylenediaminetetraacetic acid), DTPA (diethylenetriaminepentaacetic acid)]. • The resultant product could be used to extract elements like Nd from electronic waste of Nd containing materials.
REMARKS/SUGGESTION:	
<p>RECOMMENDED WITH MODIFICATION</p> <ol style="list-style-type: none"> 1) Project is well conceived. 2) Objectives and deliverable are well defined. 3) Cost effective resins are the very good idea for rare earth extraction. 4) PI informed that the portal is reflecting budget as Rs. 52.51 instead of Rs. 52.51 lakhs. Project is recommended with total cost of Rs. 52.51 lakhs for a duration of 2 years. PI should correct the details in the portal. 	

22	
Project No.	<u>SNTMOM/331/2020</u>
Project Title	Bio-electrochemical reclamation of titanium and other rare earth metals from red mud waste using a modified microbial fuel cell approach
Institution	PSG and Sons Charities
Principal Investigator	R. Selvakumar M: 9944920032 E-mail:rsk@psgias.ac.in

Project Cost & Duration	Rs. 3744720.00 3 Yrs
Objectives of the project	<p>The aim of the project is to develop an integrated microbial and electrochemical process to leach and extract specific REE like titanium and scandium from bauxite residues. The detailed objectives are as follows.</p> <ul style="list-style-type: none"> • To develop an extremophilic and acidophilic bacterial consortium that can leach REE like titanium, scandium and other REE present in bauxite residue • To develop a polyaniline functionalized electrode surface having the capacity to electrosorb REE specifically more of titanium and scandium from the liquid leach bath • To develop a bio-electrochemical reactor capable of supporting both leaching and electrosorption process. • To determine the efficiency of the developed bio-electrochemical reactor under varying operating conditions and to optimize the best extraction process.
REMARKS/SUGGESTION:	
<p>RECOMMENDED WITH MODIFICATION</p> <ol style="list-style-type: none"> 1. Project idea is good 2. Recommended for approval with a seed money of Rs. 10 Lakhs for one year duration to establish proof of concept. 3. Suggested to take two different red mud sample from JNARDDC for the preliminary work. 	

23	
Project No.	<u>SNTMOM/355/2020</u>
Project Title	Exploring the Practicability of Extracting Platinum and Palladium from the Mineral Beds of Sittampudi Village in Salem District of Tamil Nadu An Experimental and Molecular Dynamics Approach
Institution	National Institute of Technology Trichy
Principal Investigator	<p>Karthik V</p> <p>Email: karthikv@nitt.edu</p> <p>Mb. No.9788444987</p>
Project Cost & Duration	Rs. 6762754.00 Duration: 3 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • Exploring the practicability of extracting Platinum and Palladium from the mineral beds of Sittampudi village in Salem district of Tamil Nadu. • Detailed mineralogical studies on the above-mentioned chromite bands to improve the extraction efficiency. Extraction of Pt and Pd from the

	<p>aforementioned ore using the solvent extraction method and weak-base anion exchanger.</p> <ul style="list-style-type: none"> • Selection of suitable anion exchanger resin and organic solvent using molecular dynamics simulations. Process optimization, economic assessment, and recommendations for scaling-up the process.
REMARKS/SUGGESTION:	
<p>RECOMMENDED WITH MODIFICATION</p> <ol style="list-style-type: none"> 1) Project idea is good. 2) Preliminary work should be undertaken on actual samples to demonstrate the presence of platinum group of minerals. 3) Recommended for a seed money of Rs. 15 Lakhs for one-year duration to establish the proof of concept. 	

24	
Project No.	<u>SNTMOM/380/2020</u>
Project Title	Development of perovskite based materials using inexpensive RE mixed oxides precursors derived from Indian beach sands for room temperature magnetic refrigeration applications
Institution	CSIR Indian Institute of Chemical Technology
Principal Investigator	Vasundhara Mutta Email: mvas@iict.res.in Mb. No.9496445333
Project Cost & Duration	Rs. 6199270.00 Duration: 2Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • To make the direct use of mixed rare earth oxides (available at Indian Beach sands) as cost effective and efficient raw materials for the development of Perovskite manganite materials for the magnetic refrigeration applications near room temperature in the following way • To develop [REMIX]0.67A0.33MnO3 (A=Sr,Ca,Baetc...) compounds and probe their magnetocaloric properties aiming to have magnetic transition temperature (TC) between 290K to 310K and magnetic entropy change values (?SM) around 2 J/kg-K under 10 kOe field. • Tuning the values of ?SM either by the substitution of other RE elements at the A-site or by defect engineering mechanism to 4 J/kg-K under 10 kOe field and maintain the TC between 290K to 310K. • To enhance the ?SM values to 5 J/kg-K under 10 kOe field by maintaining the same TC range via defect engineering mechanism at the A-site. • Finally to demonstrate the efficacy of the developed materials for the magnetic refrigerator at room temperature.

REMARKS/SUGGESTION:

RECOMMENDED WITH MODIFICATION

- 1) Project idea is good.
- 2) Requirement of product development for 1 tesla is difficult.
- 3) Project may be taken up in two phases. In the first phase the material development should be completed. If the research outcomes of phase-1 are encouraging a joint proposal for device development with NFTDC to be submitted.
- 4) Recommended with a revised budget Rs. 51 lakhs for one year for phase-1 to enable procurement of capital equipment.

25	
Project No.	<u>SNTMOM/386/2020</u>
Project Title	Recovery of galena, sphalerite from lead zinc tailings by integrated energy efficient ultrafine comminution and novel shear floc-flotation and its impact on downstream Paste fill
Institution	Indian Institute of Technology Hyderabad
Principal Investigator	Narasimha Mangadoddy M: 9505754134 E-mail: narasimha@che.iith.ac.in
Project Cost & Duration	Rs. 7214700.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • To characterize the mineralogical, rheological and settling rate information of the lead/zinc tailings including re-grinding fines for a better understanding of feasible beneficiation routes. • To explore and study energy efficient fine grinding for the possible liberation of galena, sphalerite, and other minor metals To develop the up-scale novel cyclone design for beneficiating ultra-fine multi-component feed efficiently at industrial capacity • To explore a suitable centrifugal separator for recovering maximum heavy density minerals from the ultrafines. • To recover the galena and sphalerite rich particles by adopting novel ultrasonic treated/conditioned shear floc-flotation processes mainly at rougher-scavenger stages for the required mineral grade enrichment. • To develop an optimized process flow-chart for energy-efficient beneficiation of lead-zinc tailings producing smelter grade feed. • To develop paste fill application utilizing as received tailings and generate.

REMARKS/SUGGESTION:

RECOMMENDED WITH MODIFICATION

1. Project idea is good
2. Recommended for approval with a seed money of Rs. 10 Lakh for one year duration to

establish proof of concept.
3. Preliminary work should include beneficiation and size wise mineralogical studies.

26	
Project No.	<u>SNTMOM/391/2020</u>
Project Title	Additive manufacturing of Rare-earth based Nd-Fe-B magnets
Institution	International Advanced Research Centre for Powder Metallurgy and New Materials
Principal Investigator	Raghavan Gopalan Email: gopy@arci.res.in Mb. No.9840656295
Project Cost & Duration	Rs. 7057770.00 Duration: 2 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • Fabrication near net shaped Nd-Fe-B magnets by Additive Manufacturing • To improve the density of additively manufactured Nd-Fe-B magnets • To obtain an anisotropic magnet by magnetic field annealing of the additively manufactured Nd-Fe-B magnet
REMARKS/SUGGESTION:	
RECOMMENDED WITH MODIFICATION	
<ol style="list-style-type: none"> 1) The defined technique is difficult to scale up but good enough for proto-typing many designs. 2) Validation and benchmarking is to be done. 3) Collaboration to be done with NFTDC, Hyderabad for designing and fabrication of magnet. 4) Recommended for a revised budget of Rs. 52 lakhs for two year. 	

27	
Project No.	<u>SNTMOM/396/2020</u>
Project Title	Innovative approach to recover chromite value from low-grade chromite ore, fines and slimes by dry and wet beneficiation technique.
Institution	CSIR Institute of Minerals and Materials Technology
Principal Investigator	Prasanta Kumar Baskey M: 9470393508 E-mail: pkbaskey@immt.res.in

Project Cost & Duration	Rs. 7066000.00 2Yrs
Objectives of the project	<ul style="list-style-type: none"> • Process development for dry beneficiation of low-grade chromite ore, slimes & tailings. • Recovery of chromite values from low-grade/sub grade (10-30% Cr₂O₃) chromite ores resources by dry beneficiation and by enhanced gravity separation technique. • The utilisation of stock piled tailings and slimes (9-20 % Cr₂O₃) with required Cr₂O₃ content and Cr/Fe ratio for metallurgical and refractory industries. • Development of advanced separation techniques by exploiting the combination of gravity, magnetic and efficient air classification processes (Air Classifier, Air Jig, Air Table, Magnetic separators etc.).
REMARKS/SUGGESTION:	
RECOMMENDED WITH MODIFICATION	
<ol style="list-style-type: none"> 1. Project idea is good. 2. Recommended for approval with a seed money of Rs. 10 Lakh for one-year duration to establish proof of concept. 3. Proposal should include the work done so far in the field of chromite ore 	

28	
Project No.	<u>SNTMOM/397/2020</u>
Project Title	Process development for the recovery of tungsten values from lean grade Indian resources.
Institution	CSIR Institute of Minerals and Materials Technology
Principal Investigator	SHIVAKUMAR ANGADI M: 8763866142 E-mail: shivakumar@immt.res.in
Project Cost & Duration	Rs. 7453650.00 3 Yrs
Objectives of the project	The flowsheet for the beneficiation of tungsten ore consists of processing the ore by physical methods such as gravity and magnetic separation techniques to recover the concentrate. However, considering the low metal content and the fine dissemination of tungsten bearing minerals in the plant tailings or in the run-of-mine ore, it is usually difficult to get the desired grade of the concentrate. On the other hand, efforts to obtain high-grade concentrate by multi-stage processing lead to losses of tungsten values. There is a need to develop suitable process for the recovery of tungsten values from the lean grade resources. Over time, many new beneficiation equipment and new chemical reagents have been invented. In view of this, advanced beneficiation and extraction studies are needed to update tungsten recovery technology. The main objective of the present proposal is to develop a process flowsheet for the

	recovery of tungsten values present in the low-grade (0.2% WO ₃) resources.
REMARKS/SUGGESTION:	
RECOMMENDED WITH MODIFICATION	
<ol style="list-style-type: none">1. Project idea is good2. Recommended for approval with a seed money of Rs. 10 Lakh for one year duration to establish proof of concept.3. Preliminary work should be undertaken on Hutti gold mines tailings.	

5. The following projects were recommended for resubmission to next PERC.

RESUBMISSION TO NEXT PERC - 6 nos.

1	
Project No.	<u>SNTMOM/67/2020</u>
Project Title	Definition of delay sequencing in blast designs using advance analytical techniques for optimization of blast fragmentation and improving mine economics in non-coal mines
Institution	CSIR Central Institute of Mining and Fuel Research
Principal Investigator	AVTAR KRISHEN RAINA 9422806689 rainaji@cimfr.nic.in
Project Cost & Duration	Rs. 5145000.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • Investigations in rock explosive interaction at different delay sequences using high speed data acquisition and pressure measurements. • Generation of significant database for analysis of combinations of delay sequences in blasting and fragmentation assessment. • Analysis of data using deep learning methods and response surface analysis • Models for delay sequencing and fragmentation distributions • Development of guidelines and application for industrial use - Make in India
REMARKS/SUGGESTION: RESUBMISSION TO NEXT PERC PI had connectivity issues and decided to submit / resend the proposal to next PERC	

2	
Project No.	<u>SNTMOM/70/2020</u>
Project Title	Investigation on the development Al-Al Cladding Material through Compound Casting Process-Experiments and Numerical Simulations
Institution	Maulana Azad National Institute of Technology Bhopal
Principal Investigator	Ramesh Kumar Nayak M: 8763724080 E-mail: rameshkumarnayak@gmail.com

Project Cost & Duration	Rs. 5258850.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • Development of clad AA3003/AA4045 compound casting slab experimentally. • Investigation and control of thermal profile at the clad interface through modeling and simulation (finite element analysis (FEA)). • Rolling of compound casting slab to develop cladding sheet • Establishing mechanical properties and microstructure correlation at the clad interface
REMARKS/SUGGESTION: RESUBMISSION TO NEXT PERC <ol style="list-style-type: none"> 1) Deliverables to be restricted and made morerealistic. 2) Scale has to be defined in the technology. 3) Needs to be properly calibrated against the benchmark. 4) Should be resubmitted for 2 years with budget pruning. 	

3	
Project No.	<u>SNTMOM/108/2020</u>
Project Title	Red Mud Valorization to Achieve Zero Waste, Conversion of Residue Into Diagnostic X-Ray Shielding Tiles After Recovery of Scandium
Institution	CSIR Advanced Materials and Processes Research Institute
Principal Investigator	Shabi Thankaraj Salammal M: 8754743511 E-mail: tsshabi@ampri.res.in
Project Cost & Duration	Rs. 10308080.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • The main objective of this project is to promote the zero-waste utilization of red mud. • This main objective articulates into few work packages (WPs). The amount of works involved in each WPs is discussed in the methodology section. • The interconnection between each WPs and the responsible laboratory is schematically illustrated in the pert diagram. WP1: Mineralogical, chemical composition and thermochemical analysis of red mud. WP2: Acid Leaching and Recovery of Sc from leach solution using solvent extraction technique and purification. • WP3: Fabrication of industrial X-ray and X- ray shields through hot compaction using unleached (as-collected) red mud. WP4: Fabrication of diagnostic X-ray shielding tiles through ceramic route using red mud residue. • WP5: Mechanical strength, density and leaching studies of the

	developed shield. WP6: Diagnostic, industrial and g-ray attenuation characteristics of developed shield.
REMARKS/SUGGESTION: RESUBMISSION TO NEXT PERC <ol style="list-style-type: none"> 1) Project idea is good but deliverables need to cut down 2) “Conversion of residue into diagnostic X-Ray shielding tiles” and “Recovery of Scandium” can be submitted as two different projects with 2 year duration 3) Ageing behaviour of tiles needs to be studied. 4) Targeted true density value of red mud should not be exceeded 	

4	
Project No.	<u>SNTMOM/130/2020</u>
Project Title	Bio-Reverent- Recover of Ga, Ge and In through innovative biotechnology and process integration
Institution	Indian Institute of Technology Delhi
Principal Investigator	Rohan Jain M: 8690508166 E-mail: rjain@iitd.ac.in
Project Cost & Duration	Rs. 7736040.00 3 Yrs
Objectives of the project	<p>The overarching objective of this project is the recovery of gallium (Ga), germanium (Ge) and indium (In) from zinc (Zn), copper (Cu) and aluminium (Al) production operations present in India. There are four major challenges in the recovery of Ga, Ge and In from such ores/waste are –</p> <ul style="list-style-type: none"> • Low concentration of these metals in the primary ores, • Excess of Fe(III) that hampers the down streaming of the process, • Lack of effective technology for recovery and • Lack of process integration and intensification for commercially viable recovery. <p>The specific objectives are:</p> <ul style="list-style-type: none"> • Leaching of Ga, Ge and In from ores, intermediate steps and wastes • Removal of Fe(III) from the leachates through chemical and biological methods • Recovery of Ga, Ge and In from leachates through complexation with desferrioxamine B and E and decomplexation • Process integration of leaching, Fe(III) removal and complex separation • Operation at 100 L/ day scale to demonstrate the techno-economic feasibility.
REMARKS/SUGGESTION:	

RESUBMISSION TO NEXT PERC

1. Concept well defined
2. PI was advised to do some preliminary elemental analysis of samples.
3. Suggested to join the same work with HCL and HZL.
4. PI should provide support letter from industry
5. Revised proposal may be submitted to next PERC with 2 years duration and suitable revision in budget with proof of concept.

5	
Project No.	<u>SNTMOM/156/2020</u>
Project Title	Un-diluted Recycling of Cast Aluminium Alloys Containing High Fe Impurity Suitable for SMEs
Institution	BML MUNJAL UNIVERSITY
Principal Investigator	KAMESWARIPRASADA RAO AYYAGARI E-mail: akprasada@yahoo.com Mb. No. 8295963823
Project Cost & Duration	Rs. 14676350.00 Duration: 2 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • Modify the morphology of Fe-rich intermetallics in the recycled cast aluminium alloys through minor alloy additions to remove its deleterious effects. • Remove Fe through filtration or sedimentation by addition of nano / micro / macro powders of Zr, Mn, Cr • To optimize process parameters viz. powder composition, holding time and temperature for Fe removal.
REMARKS/SUGGESTION:	
RESUBMISSION TO NEXT PERC	
<ol style="list-style-type: none"> 1) Project idea is good but problem definition and process needs more clarity. 2) Project cost is too high and not commensurate with work proposed. 3) Process details has to be corrected and the project proposal has to be revised and resubmitted. 4) Proposal should be formulated in 2 phases. Based on the outcomes of the first phase, the 2nd may be submitted. 	

6	
Project No.	<u>SNTMOM/254/2020</u>

Project Title	Novel Material Manufacturing method for Large Volume Cast Metal Matrix Nanocomposites (Ultra-Cast)
Institution	Malaviya National Institute of Technology Jaipur
Principal Investigator	Sreekumar Vadamakke Madam E-mail: sreekumar.meta@mnit.ac.in Mb. No. 9400010768
Project Cost & Duration	Rs. 7758200.00 Duration : 3 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • Synthesis of feedstock MMNC that comprise a double step mixing technique-Distributive mixing + Dispersive mixing- to achieve • Nano composites with varying particle loading (aimed for 1-5wt%) • Faster and efficient dispersion and distribution of nano particles by the combined effect of ultrasonication and impeller mixing • Narrow size distribution of nano reinforcements in the composites • The incorporation of all nano particles by wetting and subsequent suspension in liquid metal. • Casting of large volume MMNC by dilution of feedstock composite in large volume aluminium (Dilution-compo-casting technique • Shaping of the MMNC into selective components via squeeze casting and centrifugal casting techniques. • Selection of metal and reinforcement, manufacturing of process facility, optimization of processing parameters, characterization of nanocomposites castings • Dissemination of new understandings as technical papers, IPR and Technology Transfer
<p>REMARKS/SUGGESTION:</p> <p>RESUBMISSION TO NEXT PERC</p> <ol style="list-style-type: none"> 1) Project idea of dual mixing technique is good. 2) But proposal has to be recast with clear definition of sizing and scale up. 3) Cast product should be demonstrated and benchmarked. 4) Project should be revised for 2 years with suitable revised budget. 	

6. The list of new projects NOT RECOMMENDED is as below:-

These proposals were not recommended as the (i) objectives are very sketchy and methodology not clear or doable; (ii) proposals not directly in the thrust areas, (iii) outcomes are not relevant or impactful, (iv) there is no visible translational potential; (v) similar projects have already been funded, (vi) it could be directly done as a consultancy project with the industry; (vii) preliminary proof of concept is not done; (viii) the proposed work can be done by PI within the facilities available with them and it does not really need a project proposal;(ix) in a few cases PI has not adequate domain knowledge in mining or minerals or lacking a partner with domain knowledge, (x) casual approach to problem definition and a loose connection made between mining, minerals and waste.

NOT RECOMMENDED – 68 nos.

1	
Project No.	<u>SNTMOM/7/2020</u>
Project Title	Study on plausible excavation methodology for recovery of minerals lying in the close proximity of the structures
Institution	CSIR Central Institute of Mining and Fuel Research
Principal Investigator	VIVEK KUMAR HIMANSHU 8102496571 vivekchimanshu@cimfr.nic.in
Project Cost & Duration	Rs 6537000.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • Development of lime-based non-explosive rock breaking compound for rock excavation using large diameter drilling. • Investigation on the extent of application of lime-based non-explosive rock breaking compound for rock breakage. • Prospects of reducing in-situ strength of the rock mass using cryogenic pre-treatment and thereby reducing the explosive charge for rock excavation. • Development of feasible excavation methodology for recovery of minerals lying in the proximity of the structures.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. The technique is useful only for small diameter areas and not for large mine areas. 2. Need of hour is to shift to advance blasting technology. 	

2	
Project No.	<u>SNTMOM/15/2020</u>

Project Title	EVALUATING THE RARE EARTH ELEMENT POTENTIAL OF INDIAN COALS
Institution	Indian Institute of Technology Kharagpur
Principal Investigator	Dewashish Upadhyay 9083005451, dewashish@gg.iitkgp.ac.in
Project Cost & Duration	Rs. 5226100.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> To evaluate the REE potential of coal and coal by-products like fly-ash by measuring their total REE (including Y) concentrations using ICPMS. Samples from the following coal fields will be collected: Korba coalfield in Chhattisgarh, Jharia, Bokaro, and Giridih coalfields in Jharkhand, Ib river coalfield in Odisha, and Raniganj coalfield in West Bengal. We also plan to characterize the coal fly-ash from some steel and power plants in Odisha, Jharkhand, and West Bengal. To determine the LREE/HREE ratio of Indian coals. To characterize the nature of phases/minerals hosting the REEs in coal and coal by-products using detailed petrographic studies with SEM and EPMA.
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> Process to economically extract the REE should be the objective. Similar work already done. Several studies already available on characterization of REEs in coal and coal by-products. 	

3	
Project No.	<u>SNTMOM/16/2020</u>
Project Title	Ore recovery from left out pillars in underground metal mines using cemented backfill
Institution	CSIR Central Institute of Mining and Fuel Research
Principal Investigator	ArkaJyoti Das 8902461329, arkajyoti19@gmail.com
Project Cost & Duration	Rs. 3212680.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> The objective of the study is to develop a design guideline to recover ore from left-out pillars in underground metal mines with cemented backfill for different geomining conditions like shape and size of orebody, inclination of orebody, depth of cover and the conditions of

	<p>surrounding rockmass. If the guidelines are framed to recover these locked-up ores, there will be an immense benefit to the country, in general, and the industries in particular. The objective is categorised into the following deliverables:</p> <ul style="list-style-type: none"> • Detailed stability analysis of existing pillars, review of global stability using 3D numerical modelling. • Determination of suitable property of fill material for different geomining conditions. • Devising a safe method of pillar extraction for a variety of underground mining scenarios. iv. Frame general guidelines.
<p>REMARKS/SUGGESTION: NOT RECOMMENDED</p> <ol style="list-style-type: none"> 1. Simple consultancy project and does not involve much research. 2. The proposal is site specific. 3. Objectives and deliverables not well defined. 4. Lacks proof of concept. 	

4	
Project No.	<u>SNTMOM/17/2020</u>
Project Title	To develop AI based tool for optimisation of grinding circuits in mineral processing plants
Institution	Indian Institute of Technology ISM Dhanbad
Principal Investigator	Pankaj Kumar Jain M: 7766904994 E-mail: panku@iitism.ac.in
Project Cost & Duration	Rs. 2484300.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • To develop AI based computer program for grinding mill which can take input data, store them in files, estimate performance parameters, do required internal analysis and over a period of time help the plant operator in making required changes to optimize the equipment performance and minimise losses. • To develop AI based computer program for classifier which can take input data, store them in files, estimate performance parameters, do required internal analysis and over a period of time help the plant operator in making required changes to optimize the equipment performance and minimise losses. • To integrate the AI based program developed for grinding mill and classifiers to optimise overall grinding circuit performance. • To make the program capable of marking anomalous data and readings and over a period of time alert the plant operator about such deviations along with the possibility of breakdown or maintenance requirements
REMARKS/SUGGESTION:	

NOT RECOMMENDED

1. Lack of novelty.
2. Similar software is readily available
3. Lacks proof of concept

5	
Project No.	<u>SNTMOM/18/2020</u>
Project Title	Fabrication of fully automated reactor for the effective removal of hexavalent chromium from industrial effluents using surface modified neyveli lignite
Institution	MSECSVKS
Principal Investigator	SAKTHIVEL A M: 8778377440 E-mail: asakthivel@mepcoeng.ac.in
Project Cost & Duration	Rs. 1853670.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • To convert hydrophobic NeyveliLignite(NL) to Hydrophilic Lignite through depolymerization process. • The surface modified lignite(depolymerized Neyveli lignite (DPNL)) will be characterized by XPS, FTIR, SEM, Water contact angle study, AFM and Zeta potential values • The removal efficiency is going to be checked by using artificial pollutant. • To treat the pollutant in an automated working model with 5 L capacity, a prototype will be fabricated. • The detoxification efficiency of working model will be checked by analyzing the treated effluent in terms of the concentration of Cr(VI) through Inductively coupled plasma spectrometer(ICP). • To regenerate the exhausted DPNL by treating with 0.1 N HCl • To recover the Cr(VI) present in acid solution as Barium chromate by treating with Barium chloride. After purification, it can be used as a raw material for paint, Fire works industry, etc • A process patent will be filed after prior permission from MoM, New Delhi

REMARKS/SUGGESTION:

NOT RECOMMENDED

1. Similar work has been done by CMPDI and Ministry of Coal.
2. Project is not well defined.
3. Preliminary studies should be undertaken to establish proof of concept.
4. No industry partner.

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6	
Project No.	<u>SNTMOM/23/2020</u>
Project Title	Neutralization of Bauxite Residues and their Utilization for Mine Backfilling for Sustainable Development
Institution	Indian Institute of Technology Bombay
Principal Investigator	Devendra Narain Singh M: 9820758508 E-mail: dns@civil.iitb.ac.in
Project Cost & Duration	Rs. 28684900.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • Determination of toxic potential of BRs through a series of characterization studies • Laboratory studies on different neutralization techniques for establishing their potential, as an in-situ treatment method for BRs • Characterization of neutralized bauxite residues, NBRs to determine • the efficacy of the technique • its potential as a manmade resource • Exploring the feasibility of decontamination/neutralization of the backfilled area by purging different reactive fluids (acids/gases) • Establishing the short and long-term impacts of the mine closure operation with BR/NBRs • Establishing the guidelines for the execution of the mine backfilling operation in open cast mines followed by their neutralization • Detailed characterization of LFMSF and manmade soils • Establishment of the engineering properties and nutritional values of the manmade soils • Utilization of the manmade soils as a topsoil cover for closure of mine and vegetative layer
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. Similar work has been carried out on bauxite residues. 2. Lack of innovation 3. Generic nature of work 4. Techno-economic feasibility for transportation of bauxite residue to mines has not been considered. 	

7	
Project No.	<u>SNTMOM/24/2020</u>
Project Title	Development of latest Material and Nano-Coating techniques for Investigating and Improving the Performance of Mining and Drilling Equipments to Resist the Failure due to Corrosion attack.
Institution	Maulana Azad National Institute of Technology Bhopal
Principal Investigator	Manish Vishwakarma 7869301952, 8349780109 manishvishwa1808@gmail.com
Project Cost & Duration	Rs. 12521500.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • Investigation and analysis of failures occurring in mining and drilling equipment and propose the preventive maintenance solution to avoid breakdowns. • Aim to develop better nano-composite material for manufacturing of mining and drilling equipment. • Their prevention against corrosion, hydrogen-induced cracking to avoid catastrophic failures. • Develop preventive nano-coating techniques to enhance operational life equipments used in mining and drilling.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. The proposed project is manufacturing related concern and may not be included in research domain. 2. The work is site and condition specific. 3. Objective not well defined. 	

8	
Project No.	<u>SNTMOM/25/2020</u>
Project Title	Development of low cost hand held Laser Induced Breakdown Spectroscopy tool for rapid and online scanning for mineral detection and elemental identification.
Institution	New Horizon Educational and Cultural Trust
Principal Investigator	VISWANATH BELLIE 9731121470, viswadeepu@gmail.com
Project Cost	Rs. 5713500.00

& Duration	Duration: 2 Yrs, 8 Month
Objectives of the project	<ul style="list-style-type: none"> • To develop a novel low cost portable hand held Geo chemical analytical tool for mineral identification and elemental analysis for use in the mining industry. • To make the study and equipment environment friendly. • To obtain on-site, accurate and fast data. • To link the data acquisition to mobile or tablet. • To connect the results to a system using cloud. • To obtain multi element data. • To have a solar backup to power the equipment. • To address the challenges of miniaturization, cost and accuracy of data.
REMARKS/SUGGESTION: NOT RECOMMENDED 1. Similar equipment is already available in market. 2. The proposed project is site specific.	

9	
Project No.	<u>SNTMOM/26/2020</u>
Project Title	Development of a process for the production of chromic oxide from chromite beneficiation plant tailing
Institution	CSIR National Metallurgical Laboratory
Principal Investigator	RANJEET KUMAR SINGH M: 7544907445 E-mail: kranjeet@nmlindia.org
Project Cost & Duration	Rs. 58,16,000 2Yrs
Objectives of the project	Development of a process for the production of chromic oxide from chromite beneficiation plant tailing.
REMARKS/SUGGESTION: NOT RECOMMENDED 1. Similar work already undertaken. 2. Work to be undertaken is not mentioned clearly. 3. Lacks proof of concept 4. No relevant letter from industry. 5. Need for such high amount of chromium not justified	

10	
Project No.	<u>SNTMOM/35/2020</u>
Project Title	Development of integrated Geology-Geophysics-Geochemical technique for targeting G3 stage of sulphide mineral exploration in Betul Fold Belt, Central India
Institution	CSIR National Geophysical Research Institute
Principal Investigator	DEWASHISH KUMAR 9390407602, dewashishkumar@ngri.res.in
Project Cost & Duration	Rs. 9673000.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • High Resolution-Electrical Resistivity and Induced Polarization Tomography mapping of sulphide bearing horizons in shallow subsurface through integrated Geological, Geophysical and Geochemical investigations. • Enumerate the mantle-melting process and crustal assimilation for the associated processes in the formation of Ni-Cu-PGE bearing sulphide minerals and volcanic hosted massive sulphide (VHMS) ores, and development of conceptual ore genetic models.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. Similar work is already in process by GSI. 2. PI can collaborate with GSI to avoid duplication of work. 	

11	
Project No.	<u>SNTMOM/40/2020</u>
Project Title	Optimization of support system and left-out in-situ pillars during overhand cut-and-fill stopping operations in underground metal mines
Institution	CSIR Central Institute of Mining and Fuel Research
Principal Investigator	Manoj Namdeo Bagde 8275045160 mnbagde@cimfr.nic.in
Project Cost & Duration	Rs. 7925200.00 3 Yrs

Objectives of the project	<ul style="list-style-type: none"> To develop empirical design guidelines with aim to optimize support system requirement and left-out in-situ pillars during the overhand cut-and-fill stoping operation in underground metal mines without jeopardizing safety of the mining environment and people involved with. If the new design guidelines are framed with optimization of support system, then there will be an immense benefit to the country, in general, and the industries in particular.
REMARKS/SUGGESTION: NOT RECOMMENDED <ol style="list-style-type: none"> The proposed project work does not provide any innovative skill. Comprehensive proposal should have been given for classification. Objectives not well defined. Lacks proof of concept. 	

12	
Project No.	<u>SNTMOM/48/2020</u>
Project Title	Development of multi-component high entropy alloys with significantly retarded degradation rate in corrosive mines environment
Institution	Indian Institute of Science, Bengaluru
Principal Investigator	Chandan Srivastava M: 9900626327 E-mail: csrivastava@iisc.ac.in
Project Cost & Duration	Rs. 5835532.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> To investigate the degradation behaviour of some selected high entropy alloy (HEA) pellets subjected to corrosive mines environment. To understand the mechanism of degradation of different HEAs with time of exposure using extensive microstructural characterization of materials. To recommend the optimal alloy chemistry and microstructure which can maximise the reliability of materials in corrosive mines environment.
REMARKS/SUGGESTION: NOT RECOMMENDED <ol style="list-style-type: none"> Target based use of the alloy has not been specified. Fundamental material science research work rather than translational R&D. Deliverables are vague. 	

13	
Project No.	<u>SNTMOM/50/2020</u>
Project Title	Development of LiDAR-based real-time volume and weight measurement system for transported minerals
Institution	CSIR Central Institute of Mining and Fuel Research
Principal Investigator	Jitendra Kumar Singh 9430136304, drjksingh@cimfr.nic.in
Project Cost & Duration	Rs. 27403550.00 2 Yrs, 6 Months
Objectives of the project	<ul style="list-style-type: none"> • The manual accounting of the volume and weight of mineral being transported by trucks and trains can be inaccurate. At present, in most of the mines in India, there is no system for on-line measurement of production, dispatch, and stock. There is always an issue between mines and their customers for the quality and quantity of the minerals being dispatched. This may be due to the involvement of humans in various stages of loading, weighing, and dispatch. Therefore, avoidance of human intervention is strongly required to develop a transparent and unbiased system. To do so an automated online monitoring system for the measurement of volume and weight of minerals may be developed. • OBJECTIVES: (i) To develop an real-time volume and weight measurement system • (ii) Determination of size (lumps/fines) of minerals • (iii) Determination of under-loading/over-loading of minerals in railway wagons • (iv) Field trial of the developed system in a mine • (v) Technology transfer and commercialization.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. The systems are widely available in market 2. No innovation or novelty in the proposed work. 	

14	
Project No.	<u>SNTMOM/55/2020</u>
Project Title	Purification of Indian Magnesite Through Fusion Technique for Refractory Application
Institution	CSIR Central Glass and Ceramic Research Institute

Principal Investigator	Himansu Sekhar Tripathi M: 9433457546 E-mail: hstripathi@cgcri.res.in
Project Cost & Duration	Rs. 7935174.00 3 Yrs
Objectives of the project	Magnesia containing refractory is crucial for steel and cement industries. Impure Indian magnesites are not used for making refractory for steel industry and are mostly imported (152.89 US\$ in 2018-19). Present attempt will be aimed at converting impure Indian magnesites to superior fused magnesia aggregate using combination of physical separation and/or fusion processing. Initially, the impurities will be reduced through physical separation methods like froth flotation. This will be followed by fusion technique in presence of additives so that the pure magnesia phase can be separated from the impurities through gravity separation. The final product of the project would be purified large grain fused magnesia usable for the production of magnesia based composite refractory. Fused magnesia with bigger crystal size will impart the good corrosion resistance to the magnesite refractory. Process know-how will be developed to produce purer fused magnesia.
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. Work to be undertaken is not mentioned clearly. 2. PI should have undertaken comparative chemical analysis of two different mine samples. 3. Lack clarification regarding beneficiation process and liberation size of sample. 4. Lacks proof of concept. 	

15	
Project No.	<u>SNTMOM/72/2020</u>
Project Title	Preparation of Barium Titanate Suitable for Electronic Industry from Unutilized Waste Barites of Andhra Pradesh
Institution	VIGNANS FOUNDATION FOR SCIENCE TECHNOLOGY AND RESEARCH
Principal Investigator	P. Ashok Kumar M: 9866621633 E-mail: drpak_chem@vignan.ac.in
Project Cost & Duration	Rs. 4951000.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • To prepare barium titanate from unutilized waste barites obtained from Kadapa region of Andhra Pradesh. • Characterization of barium titanate produced by measuring the

	physico-chemical properties. <ul style="list-style-type: none"> • Testing the material for its suitability by electronic industry.
REMARKS/SUGGESTION: NOT RECOMMENDED <ol style="list-style-type: none"> 1. Objectives and deliverables not well defined. 2. Lacks innovation and novelty 3. Project related to electronic industry rather than thrust areas of MoM 	

16	
Project No.	<u>SNTMOM/81/2020</u>
Project Title	Design guidelines for the safe extraction of orebody by Underhand Long Hole Open Stopping (ULHOS) with paste filling method
Institution	CSIR Central Institute of Mining and Fuel Research
Principal Investigator	RANJAN KUMAR 8252188063 ranjan@cimfr.nic.in
Project Cost & Duration	Rs. 2964680.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • This research aims to develop the design guidelines for the safe extraction of orebody by Underhand Long Hole Open Stopping (ULHOS) with paste filling method. The research activities cover the following parts of the design guidelines: • Determination of safe stope dimensions for different geomining conditions, • Design of optimal stoping sequence to minimise the strata/ground control problems, • (Assessment of suitable strength of paste material for different geomining parameters, and • Design of optimum crown pillars and sill pillars under varying geomining conditions.
REMARKS/SUGGESTION: NOT RECOMMENDED <ol style="list-style-type: none"> 1. Similar project work already done. 2. Lacks innovation. 3. Project is only site specific. 	

17	
Project No.	<u>SNTMOM/85/2020</u>
Project Title	Improving the performance of Malanjkhand copper concentrator under Hindustan Copper limited through modelling and simulation analysis.
Institution	CSIR National Metallurgical Laboratory
Principal Investigator	Ajit Kumar Swain M: 9001682496 E-mail: akswain@nmlindia.org
Project Cost & Duration	Rs. 7205000.00 2Yrs
Objectives of the project	<ul style="list-style-type: none"> • Development of simulated model for the Malanjkhand Copper beneficiation circuit. • Identify the bottlenecks in the existing beneficiation circuit. • Simulation analysis and predicting the optimum parameters to improve the plant performance with following targets. a) Throughput/capacity increase > 15% b) Copper (Cu) recovery > 92 % c) Concentrate grade (% Cu) > 27% d) Reduction in reagent consumption, specific power consumption and specific water consumption.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. Lack of preliminary work to establish proof of concept. 2. No mention about number of samples that can be done by the circuit 3. Work methodology not well defined. 4. Lacks novelty and research innovation. 	

18	
Project No.	<u>SNTMOM/111/2020</u>
Project Title	High-temperature molten salt electrolysis of metal-oxide phase mixture for development of high entropy alloys for energy applications
Institution	Indian Institute of Technology Bhubaneswar
Principal Investigator	Amritendu Roy E-mail: amritendu@iitbbs.ac.in Mb. No. 9438169548
Project Cost & Duration	Rs. 4456176.00 Duration: 3 Yrs, 0 Mth
Objectives of the project	(i) To synthesize high entropy alloys using high-temperature molten salt electrolysis of oxide phase mixture

	(ii) Structural and microstructural characterization of the samples prepared. (iii) Evaluation for potential hydrogen storage applications of the sample prepared based on alloy design. (iv) Thermoelectric characterization of the samples prepared based on alloy design.
REMARKS/SUGGESTION: NOT RECOMMENDED	
1) The process is tedious and expensive. 2) Large scale production using this high entropy alloy is doubtful. 3) It's a fundamental research proposal. 4) Application chosen is incorrect. (Hydrogen storage)	

19	
Project No.	<u>SNTMOM/116/2020</u>
Project Title	Value Addition to Over Burden and Lean Ore from Sukinda Boula-Nuasahi Region
Institution	National Institute of Technology Rourkela
Principal Investigator	SANTOSH KUMAR SAHOO M: 9040289501 E-mail: santoshsahoo@nitrkl.ac.in
Project Cost & Duration	Rs. 4187200.00 3 Yrs
Objectives of the project	Recovery of Fe-Cr-Ni compounds from Alluvium, Murrum and Lateritic ore available near SukindaBoula-Nuasahi Region.
REMARKS/SUGGESTION: NOT RECOMMENDED	
1. Work methodology not well defined 2. Preliminary work of mineralogical& chemical analysis of overburden not undertaken 3. No proof of concept.	

20	
Project No.	<u>SNTMOM/118/2020</u>

Project Title	Process Development and Techno-economic Evaluation for Continuous Conversion of Medium Purity Indian Natural Graphite to Functionalized Graphene for Energy Storage Application
Institution	CSIR National Metallurgical Laboratory
Principal Investigator	Ranjan K Sahu E-mail: rksahu@nmlindia.org Mb. No. 7903042199
Project Cost & Duration	Rs. 123.08 Duration: 3 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> (i) To develop a semi-automatic, simple and cost-effective process for continuous conversion of medium purity (85 - 90%) natural flake graphite to functionalized graphene in the scale of 2 kg capacity per batch; 2. (ii) To achieve the high production rate of functionalized graphene without or less amount of collagen protein by using oxidizing agent and organic acid under mechanical driving forces; (iii) To obtain energy storage performance of graphene with capacitance in the range of 200 – 250 F/g at a charging rate of 1 A/g and high cycle life (>10000) using the proposed methodology; (iv) To optimize the complete process using industrial grade chemicals, and techno-economic evaluation for the continuous production of functionalized graphene from medium purity Indian flake graphite.
<p>REMARKS/SUGGESTION:</p> <p>NOT RECOMMENDED</p> <ol style="list-style-type: none"> 1) Commercial grade graphite with functional group is better than natural graphite. 2) Project idea is quite old. NML Chennai was given a similar project for conversion of graphite to graphene in the past. 3) Pet coke can prove to be a much better material than graphite. 4) Process engineering to product is quite difficult. 5) Product in-terms of super capacitor is not properly justified. 	

21	
Project No.	<u>SNTMOM/121/2020</u>
Project Title	Development of Crash-worthy Light Weight Metal Matrix Nano Composite and Alloy Auto Wheels with Improved Mechanical Properties
Institution	Indian Institute of Technology Tirupati
Principal Investigator	Ajay Kumar

	E-mail: drajaykumarp@iittp.ac.in Mb. No. 6360201557, 9482519904W
Project Cost & Duration	Rs. 12499272.00 Duration: 3 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • Design engineering of Alloy wheels for Crash Performance deploying advanced modeling and CAE tools and virtual validation of designs to meet the functional and performance requirements • To achieve the resistance force of 300kN with max 25mm displacement o 4% elongation in Spoke section of wheel, and yield strength >190MPa • Design and development of new light weight metal matrix nano composite wheel reinforced with SiC, Al₂O₃ and Graphene Flakes
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> 1) Composite development method is not properly defined. 2) Deliverables not well defined. 3) Project budget is quite high. 4) This is not a translational work. 	

22	
Project No.	<u>SNTMOM/136/2020</u>
Project Title	Development of coating for reducing air burn (net carbon consumption) of anodes in aluminium electrolysis cell
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre
Principal Investigator	SUCHITA B. RAI E-mail: suchitarai@jnarddc.gov.in Mb. No. 0942368034
Project Cost & Duration	Rs. 9692800.00 Duration: 2 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • Develop alumina-based anode coating material for minimizing air burn of anodes to reduce net carbon consumption in aluminium electrolysis cell. • Study the effect of coating material on metal purity and recyclability of anode butt
REMARKS/SUGGESTION: NOT RECOMMENDED	
1) Inter layer for coating and concept is not correct.	

<ol style="list-style-type: none"> 2) Effect of anode conductivity is not explained. 3) Carbon composite can be taken. 4) Alumina on its own cannot stick to graphite as it starts dissolving in the bath.

23	
Project No.	<u>SNTMOM/137/2020</u>
Project Title	Preparation and Characterization of Biocompatible Alumina based Nanocomposites for Dental Implants
Institution	Anna University
Principal Investigator	N. Rajendran E-mail: nrajendran@annauniv.edu Mb. No. 9444908426,
Project Cost & Duration	Rs. 9055200.00 Duration: 2 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • To prepare biocompatible and corrosion-resistant alumina composite coatings on Titanium metal substrate to achieve the desirable properties for bone in-growth. • The nanostructured mixed ceramic oxide coatings on Titanium with various formulations such as Al₂O₃- ZrO₂, Al₂O₃- Ta₂O₅, Al₂O₃- Nb₂O₅, Al₂O₃- CeO₂ will be done to enhance the bioactivity of the implant. • The cells proliferation rate will be analyzed using cell viability kit. • Cell morphological analysis studies will be carried out to analyse the cells spreading. • The expression of the genes (OPN, OCN, Col 1, ALP, osteonectin, RUNX2, BMP-2) responsible for osteogenesis will be analysed using RT-PCR. • The histomorphological analysis will be done to evaluate bone formation and mineralization in animal models • The bacterial adhesion test will be carried out for various time periods to understand the inhibition effect of the prepared sample.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1) Similar studies have been carried out on dental implant and implantation. 2) Project idea is good but approach is fundamental in nature. 3) Surface modified titanium dual structure would be better. 4) Sol-gel coating is not an optimum technique. 	

24	
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Project No.	<u>SNTMOM/142/2020</u>
Project Title	Identification of potential sedimentary formations, OB dumps and development of indigenous extraction procedure for strategic Trace metals and REE in shale and associated rocks
Institution	CSIR Central Institute of Mining and Fuel Research
Principal Investigator	JAYWARDHAN KUMAR E-mail: kumar.jaywardhan@gmail.com Mb. No. 7766939569
Project Cost & Duration	Rs. 39346450.00 Duration: 3 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • Evaluation and identification of sedimentary formation and over burden (OB) having potential for strategic trace metals and rare earth elements (REE) of shale and rocks of Gondwana and Tertiary formation in India • Source evaluation and accumulation process of trace and REE • Mapping of potential sites considering the strategic importance • Development of extraction procedure based on the concentration of REE found in the shale and rocks • Resources estimates and economics evaluation
<p>REMARKS/SUGGESTION:</p> <p>NOT RECOMMENDED</p> <ol style="list-style-type: none"> 1) Deliverables are confusing and vague. 2) Project seems to be more of a capacity building initiative. 3) Prior work should be done. 	

25	
Project No.	<u>SNTMOM/144/2020</u>
Project Title	Geochemical and geophysical investigations for delineating the potential REE zones and link processes involved in distribution in the marine environment
Institution	CSIR National Institute of Oceanography
Principal Investigator	Pratima M Kessarkar 9922854476 pratimak@nio.org
Project Cost & Duration	Rs. 32062330.00 3 yrs
Objectives of the project	<ul style="list-style-type: none"> • To understand the process link between river-estuary-onshore deposition. • To identify potential areas with enriched REE in marine environment.

REMARKS/SUGGESTION:

NOT RECOMMENDED

1. Similar work is in process by GSI for marine exploration.
2. PI can collaborate with GSI to avoid duplication of work

26	
Project No.	<u>SNTMOM/145/2020</u>
Project Title	Development of a Classification System for the Dump Slope Stability Assessment of Opencast Non-Coal Mines in Southern India
Institution	National Institute of Technology Karnataka Surathkal
Principal Investigator	Sandi Kumar Reddy 9448721700, skreddy@nitk.edu.in
Project Cost & Duration	Rs. 9976310.83 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • Study the layout of the opencast non-coal mines by visiting the mine project sites in southern India. • Detailed geological investigations i.e. joint dip amount / dip direction, joint spacing, condition of the discontinuities and shear zones in the field. • The input parameters like subsurface geotechnical investigation, rock properties (Strength parameters) and settlement analysis of dump material tests will be carried out in the field and laboratory. • Design of pit/bench slopes under different geo-mining conditions by using numerical and analytical methods. • Development of guidelines for monitoring of dump slopes under different geo-mining conditions. • Develop a classification system for dump slope stability assessment in opencast non-coal mines. Accordingly, design guidelines and design equations/charts will be developed for different geo-mining condition.

REMARKS/SUGGESTION:

NOT RECOMMENDED

1. Similar work has already been carried out and outcomes are readily available.
2. Lacks innovation.

27	
Project No.	<u>SNTMOM/147/2020</u>
Project Title	An integrated approach to sustainable mining

Institution	Indian Institute of Technology ISM Dhanbad
Principal Investigator	Satish Kumar Sinha 8002114960 satishsinha@iitism.ac.in
Project Cost & Duration	Rs. 3774460.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • It would be apt to introduce concept of sustainable mining framework catering to dimensions of Society, Ecology & Economy. • A further two layers of galvanization with parameters like Conservation, Accountability and Carrying capacity with topping of Gender equity, Diversity & Democratic shall be introduced in alignment with nature to develop a sustainable mining framework (SMF). • An extensive statistical analysis will be carried out to find the relations and behaviour of socio economic and ecological parameters in terms acceptable models and tests which are vital for sustainable mining activities.
REMARKS/SUGGESTION: NOT RECOMMENDED <ol style="list-style-type: none"> 1. The project is theoretical rather than research and practical work. 2. Objectives are generic and vague 	

28	
Project No.	<u>SNTMOM/173/2020</u>
Project Title	Assessment of Strategic (Ge and Ga) and Rare Earth Elements (REE) in Neyveli Lignite, Fly Ash and Bottom Ash and Recovery of Economically Viable Elements through Suitable Technique
Institution	Annamalai University
Principal Investigator	Vasudevan S M: 9443622798 E-mail: devansiva@gmail.com
Project Cost & Duration	Rs. 19360200.00 3 Yrs
Objectives of the project	The aim of the study is to assess and examine the association of Ge, Ga, and REE's with Neyveli Lignite and Lignite ash and to establish suitable techniques for the recovery of economically viable elements from these products. Specific objectives

	<ul style="list-style-type: none"> • To determine the occurrence, distribution, and concentration of Ge, Ga, and REE's in the Neyveli Lignite deposits and Lignite ash products. • To infer the Ge, Ga and REE concentration and its relation to the Size, Magnetic and specific gravity characteristics of the Fly ash/bottom ash • To evaluate and compute Ge, Ga, and REE leaching characteristics of lignite, fly ash, and bottom ash using the hydrometallurgical technique. • To develop a pilot plant at the laboratory scale and Prototype at industrial scale to estimate recovery rate and obtain economic viability.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. Similar work has already been carried out. 2. Objectives are generic without proof of concept 3. Lacks novelty and research innovation. 	

29	
Project No.	<u>SNTMOM/174/2020</u>
Project Title	Development of AI driven Smart Inspection Vehicle Unit (SIVU) for Underground Metalliferous Mine
Institution	Indian Institute of Science Bengaluru
Principal Investigator	CHIRANJIB BHATTACHARYYA 9980017564, chiru@iisc.ac.in
Project Cost & Duration	Rs. 18485112.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • To develop an unmanned vehicle capable which can autonomously navigate in and perform inspection of hazardous workplace in underground metal mines • To develop a system for sensing of data regarding workplace hazards like presence of noxious or toxic gases and strata instability • To develop protocol for decision making regarding entry or re-entry of workers in underground workplaces • To do a Proof of Concept demonstration of the vehicle in a suitably chosen mine
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. The technology is readily available. 2. PI can approach the relevant companies directly. 3. CMERI Durgapur has already made similar type of vehicle 	

30	
Project No.	<u>SNTMOM/179/2020</u>
Project Title	D-SPECTRE - Mineralogical analysis of ores or mining wastes using hyperspectral image processing
Institution	Indian Institute of Technology Delhi
Principal Investigator	T R Sreekrishnan 9871142315, sree@dbeb.iitd.ac.in
Project Cost & Duration	Rs. 6017616.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • The aim of the project is to develop tools for mineralogical assessment of the mines using hyperspectral images analysis captured through satellites. To reach this objective, it is important to develop algorithms analysing the images and their dependence on the factors (distances, atmospheric conditions, topography and ore type). For this study, the hyperspectral images will be captured through drone. The specific objectives are: • Developing data set of hyperspectral images of different ores (feldspar and dolomite) in different conditions • Curating and Annotating the data for training neural networks. • Optimizing architectures and algorithms for generating feature embeddings and for classification of ore. • Fine tuning of architectures and algorithms for introducing invariance to environmental conditions and imaging device parameters. • The architectures will be validated on satellite data. Requisite modifications to adapt from drone data to satellite data will be done.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. The tool used is generic 2. Lacks innovative research and novelty. 	

31	
Project No.	<u>SNTMOM/184/2020</u>
Project Title	Rapid approach technologies for recovery of rare earth elements from secondary resources
Institution	CSIR National Institute for Interdisciplinary Science and Technology
Principal Investigator	Dhani Babu Talakala M: 9439621861

	E-mail: dhanibabu@niist.res.in
Project Cost & Duration	Rs. 2935800.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • Characterization of rare earth elements in secondary resources (red mud, coal ash, etc) • Pre concentrate the rare earth elements from secondary resources with suitable separation methods, • Leaching studies with commercially available mineral acid like HCl, H₂SO₄, HNO₃, etc., • Optimization of leaching process for further solvent extraction process with the support of modelling and simulation studies , • Establishment of the laboratory scale solvent extraction process with the commercially available solvents like TBP, DEHPA, PC88A, etc., • Modeling and simulation studies for optimum design of the efficient solvent extraction process , • Solvent extraction process development for the extraction of individual rare earths elements, Development of process flow sheet with material balance.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. Similar work has already been carried out. 2. Objectives are generic without proof of concept 3. Lack novelty and research innovation. 	

32	
Project No.	<u>SNTMOM/194/2020</u>
Project Title	Investigations (Petrography-Geochemistry) of carbonatites and alkaline rocks of the Sung Valley Complex, Meghayala, India with special reference to REE and Nbmineralisation.
Institution	Indian Institute of Science Education and Research Bhopal All India
Principal Investigator	Arundhuti Ghatak 9575301320 arundhutighatak@iiserb.ac.in
Project Cost & Duration	Rs. 4995650.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • To carry out detailed fieldwork and systematic sampling for a systematic mineralogical, petrological and fluid inclusion study of samples suites from carbonatites and alkaline rocks of the Sung Valley complex.

	<ul style="list-style-type: none"> To undertake detailed major, trace and REE geochemistry and stable as well as radiogenic isotope signatures of the selected samples in relation to economic mineralization. To establish the mineral and fluid paragenesis and paragenetic sequence for the REE and Nb- mineralization.
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> The work is more of exploration-based project. Objectives and deliverables not well defined. Institute may collaborate with GSI to avoid repetition of work. 	

33	
Project No.	<u>SNTMOM/197/2020</u>
Project Title	Nanoparticles-Aided Treatment of AMD and Development of Cemented Paste Backfill for Supporting Underground Stopes using Mill Tailings Impoundment
Institution	Indian Institute of Technology Guwahati
Principal Investigator	T G Sitharam 9864050388 director@iitg.ac.in
Project Cost & Duration	Rs. 83121532.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> Development of a pilot-scale AMD treatment unit for recycling and reuse of the AMD Development of mill tailing based paste as a backfill material with desired strength and deformability for supporting underground mine structures Study the effect of supernatant from tailing pond on groundwater resources of the area
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> Objectives and deliverables not well defined. Lacks research innovation Technology is already available in the market. 	

34	
Project No.	<u>SNTMOM/210/2020</u>
Project Title	Design of predictive maintenance system for mobile assets in underground

	mines using Artificial Intelligence and Internet of Things
Institution	Indian Institute of Technology ISM Dhanbad
Principal Investigator	Tarachand Amgoth 9471191420 tarachand@iitism.ac.in
Project Cost & Duration	Rs. 3733200.00 3 yrs
Objectives of the project	<ul style="list-style-type: none"> • The objectives of the proposed project are: • Design of condition-based monitoring (CbM) in real-time using the IoT and Cloud Technologies. • Design of Predictive Maintenance (PdM) technology which includes, CbM, AI model and Data Analytics • Design of strategies for Data collection and Preprocessing.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. Lacks proof of concept 2. Objectives are generic in nature 3. Related to equipment manufacturing rather than research 	

35	
Project No.	<u>SNTMOM/215/2020</u>
Project Title	Autonomous Vehicles for Mineral Mapping
Institution	SNR SONS CHARITABLE TRUST
Principal Investigator	David Rathnaraj 9487846981 davidrathnaraj@srec.ac.in
Project Cost & Duration	Rs. 5891020.00 1 Yrs
Objectives of the project	<ul style="list-style-type: none"> • To develop an autonomous system that assists the ground crew in identifying the location of minerals using Artificial Intelligence.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. No proof of concept 2. Objectives and deliverables not well defined. 	

36	
Project No.	<u>SNTMOM/216/2020</u>
Project Title	Study on Underground Excavation in Very Weak Rock Condition
Institution	Visvesvaraya National Institute of Technology Nagpur
Principal Investigator	ANIRBAN MANDAL 9158199911 amandalthesis(@yahoo.com
Project Cost & Duration	Rs. 2232500.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • Sensitivity studies The sensitivity studies aim to show the influence of the following factors on estimation of earth pressure: • Influence of ground water table, taking into account the surcharge load in non-homogeneous ground. • Effect of excavation sequences and structural support type. • Size of the cross-section and existence of central column; • Overburden and shape of the opening. • Effect of different backfill material with different compaction level. <p>Development of suitable model for analysis Suitable model will be developed for FEM analysis considering the actual ground conditions. Special attention will be given to the analysis of case-studies, in order to assess the global performance of the numerical model. Guidelines The studies performed will identify guidelines related to the analysis, design and excavation of underground mines.</p>
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. The research methodology is not convincing. 2. Proven technology already available 3. No mining engineering clarity. 	

37	
Project No.	<u>SNTMOM/220/2020</u>
Project Title	Nanoporous Organic Polymer for Size-Selective Recovery of Rare Earth Elements from Leachates of Waste Bauxite Residue (RED MUD).
Institution	CSIR Central Salt and Marine Chemicals Research Institute
Principal Investigator	Amal Kumar Mandal E-mail: akmandal@csmcri.res.in Mb. No. 8250835588

Project Cost & Duration	Rs. 6628004.00 Duration: 3 Yrs, 0 Mth)
Objectives of the project	<ul style="list-style-type: none"> • We want to develop functionalized nanoporous polymer as solid sorbents for the efficient size-selective recovery of REEs, especially Sc, from primary mining sources as well as from leachates of waste bauxite residue (RM). • We plan to develop these polymers through four different novel approaches with easy and facile synthesis routs from simply available starting materials. • Hyper-crosslinkedcyclodextrin based porous polymer for selective recovery of REEs, especially Sc from industrial waste RM. (ii) Cyclodextrin or Pillar[n]arene based porous polymer with phosphite linkage in the skeleton froREEs separation. (• Pillar[n]arene based porous polymers having a series of preorganized ligands for size-selective separation of REEs. • Porous two-dimensional nanosheets as well as polymer through photopolymerization induced dimerization inside a host cavity by employing robust self-assembling host-guest complexation strategy for size-selective separation of REEs.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1) Only scandium extraction is focused. Apart from scandium, other REE should be extracted and that would be worth exploring. 2) Extraction process is generalised. 3) Deliverables to be specified in the project. 4) Development of material is to be done with the preliminary work. 	

38	
Project No.	<u>SNTMOM/231/2020</u>
Project Title	Characterization and Process Development for Recovery of REE from Indian Primary Resources
Institution	CSIR Institute of Minerals and Materials Technology
Principal Investigator	ALOK TRIPATHY M: 9437066723 E-mail: atripathy@immt.res.in
Project Cost & Duration	Rs. 8729000.00 3 Yrs
Objectives of the project	The following are the objectives of the study proposed <ul style="list-style-type: none"> • Development of process for enrichment of REE content in Indian primary ore resources other than beach sand by physical beneficiation

	<ul style="list-style-type: none"> Development of process for recovery of REE from the enriched Indian primary ore.
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> Similar work has already been carried out by various agencies Lacks proof of concept Objectives and deliverables not well defined. 	

39	
Project No.	<u>SNTMOM/232/2020</u>
Project Title	Petrological and Geochemical Investigations for Targeting Rare Earth Minerals and Rare Metals Mineralization in the Carbonatites from selected localities in India
Institution	Rashtrasant Tukadoji Maharaj Nagpur University
Principal Investigator	KIRTIKUMAR RAMKRUSHNA RANDIVE 0985082715 randive101@yahoo.co.in
Project Cost & Duration	Rs. 10084000.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> To investigate and document the carbonatite-alkaline and ultrapotassic rocks within the proposed carbonatite shown in Fig To generate major, minor and trace elements geochemical data of each areas and correlate these rocks in space and time with each other based on their, (a) Field relationships, (b) Petrographic characteristics, (c) Geochemical signatures, and (d) Isotopic ratios. To carryout field and laboratory investigations for the Rare Earths (REE)-Rare Metals (Nb-Ta) mineralization in the proposed carbonatite localities. To study the nature (whether true magmatic carbonatites or not), genesis (deep-seated mantle origin to shallow carbothermal residua), and tectonic history (based on geochemical and other characteristics) of the selected carbonatite localities.
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> Study on carbonatites has been already done by GSI. Lacks innovation and research 	

40	
Project No.	<u>SNTMOM/237/2020</u>

Project Title	REE mineralization in migmatites and younger intrusive rocks in Sonbhadra District, Uttar Pradesh- Ore genesis and exploration significance
Institution	Indian Institute of Technology Bombay
Principal Investigator	Sakthi Saravanan Chinnasamy 0754087877 geosaks@gmail.com
Project Cost & Duration	Rs. 2362500.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> To take extensive surface traverses, map mineralized/hydrothermally altered zones, detailed structural studies at appropriate places and establish controls on mineralization with regional-scale deformation . To establish alteration mineral paragenesis, quantifying the alteration by mineral-fluid equilibria and mass balance calculations . To carry out phase petrological studies on host rocks, construct metamorphic P-T-t paths and pertinent petrogenetic grids/PT-pseudosections. To undertake systematic petrographic-geochemical studies across the alteration zones, geochemical evolution of host rocks, and integrating additional information on petrogenesis and tectonic evolution . To characterize the melt and ore fluid compositions, by inclusion petrography, microthermometry, and Raman spectroscopy . To propose a coherent ore genetic model with crustal evolution for REE mineralization in Sonbhadra area with emphasis identifying potential mineralized zones with suitable exploration strategies.
REMARKS/SUGGESTION	
NOT RECOMMENDED	
<ol style="list-style-type: none"> Lack of novelty in work. Similar exploration work already in process in GSI. Will lead to duplication of work. 	

41	
Project No.	<u>SNTMOM/248/2020</u>
Project Title	Self-reliant technology to produce high economic value products from natural graphite
Institution	CSIR Institute of Minerals and Materials Technology
Principal Investigator	Balaji Umapathi (E-mail: balaji@immt.res.in) Mb. No. 7735849789

Project Cost & Duration	Rs. 8026076.00 Duration : 3 Yrs, 0 Mth)
Objectives of the project	<ul style="list-style-type: none"> To develop process know-how for the production of high economic value Graphene, Few layer graphene (FLG), Grapheneoxide(GO) and reduced graphene oxide (rGO) from various grades of natural graphite by beneficiation and economically viable exfoliation. Techno-economic feasibility study intended to scale up the process
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> Lot of similar work have been carried out. Lacks novelty and research innovation. Technology used in the process is very old. Efficiency of temperature has not been addressed by PI. 	

42	
Project No.	<u>SNTMOM/249/2020</u>
Project Title	Technology Development to Improve Silver Recovery from Lead Zinc Ore at Zawar Mines
Institution	Malaviya National Institute of Technology Jaipur
Principal Investigator	Amar Patnaik M: 9549657318 E-mail: apatnaik.mech@mnit.ac.in
Project Cost & Duration	Rs. 22255252.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> To improve yield of native silver from ore of Baroi Mines Recovery of silver from the trailing of froth floatation process. Evolution of strategy to recover silver that remains associated with sphalerite; will be done with depressor for sphalerite and suitable frother and collector for silver mineral. Design of a process strategy for employment of hydrometallurgy to maximise silver recovery amidst extraction of Pb, Zn and Cu; shall be done if chalcopyrite is in appreciable amount with the galena and ZnS. This is not too uncommon in India. Use of bioleaching to enhance silver recovery Overall enhancement of silver recovery by 50% so that HZL is envisioned for large scale implementation of silver liberation plan.
REMARKS/SUGGESTION: NOT RECOMMENDED	

<ol style="list-style-type: none"> 1. Objective of the project is not clear 2. Deliverables not well defined 3. PI was advised to work with Hindustan Zinc Limited

43	
Project No.	<u>SNTMOM/262/2020</u>
Project Title	Leaching of Rare earth elements from Secondary Sources using Kombucha tea
Institution	SWAMI VIVEKANANDA YOGA ANUSANDHANASAMSTHANA
Principal Investigator	Writachit Chakraborty E-mail: writachit02@gmail.com Mb. No. 9748275173
Project Cost & Duration	Rs. 5539360.00 Duration : 3 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • Kombucha tea is a heterogeneous culture of both yeast and acetic acid bacteria. It contains several microorganisms e.g. Zygosaccharomyces, Acetobacter which are already reported to recover REEs from secondary sources. • It is also reported that Kombucha can be used to extract REEs from fluorescent phosphor. So, using this heterogeneous culture could provide an excellent way to extract REEs from sources like used batteries, magnets, phosphogypsum etc. • The main goal of the project is to provide a simple, cost effective, environment-friendly method using Kombucha culture for the leaching of REEs from different secondary sources. • The main objectives are: 1) Successful leaching of REEs from secondary sources like phosphogypsum, red mud, batteries, magnets etc using Kombucha tea. • Optimization of different physicochemical parameters to increase leaching efficiency • Isolation and identification of new microorganisms capable of leaching.
REMARKS/SUGGESTION: NOT RECOMMENDED <ol style="list-style-type: none"> 1) Require some preliminary work to establish proof of concept. 2) Objectives and deliverables not well defined. 3) Project is not worth pursuing. 	

44	
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Project No.	<u>SNTMOM/265/2020</u>
Project Title	Technology Development for the Extraction of Cobalt from Copper Smelter Slag
Institution	CSIR National Metallurgical Laboratory
Principal Investigator	Devabrata Mishra E-mail: dmishra.nml@nic.in Mb. No. 9470996271
Project Cost & Duration	Rs. 9133200.00 Duration :3 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • The main objective of this project is to develop efficient extraction technology for Co from various indigenous copper industry slag; both from converter and smelter slag. • The final product will be high pure Co powder (Purity >99.8%) suitable for battery or permanent magnet applications. • Recovery of other valuable metals such as Cu and Ni associated with the slag as well as utility of the process residue for construction applications will also be explored for viable techno-economic purpose.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1) Preliminary studies not carried out to establish proof of concept. 2) PI should have collected various slags from Sterlite, Hindustan copper limited etc. and studied the cobalt content in detail. 3) No information on the process route. 	

45	
Project No.	<u>SNTMOM/274/2020</u>
Project Title	Design and development of energy efficient Lithium - Graphene battery for electric vehicles in underground mines.
Institution	SSN TRUST
Principal Investigator	VENKATAKRISHNAN 9445360932 venkatakrisnangr@ssn.edu.in
Project Cost & Duration	Rs. 4072800.00 3 Yrs

Objectives of the project	<ul style="list-style-type: none"> To create an energy efficient battery and to reduce the heat release to the surrounding environment from the batteries used during mining by absorbing the heat energy and using it back to charge the battery through a self-flexible nanoTEG. To perform the different tests like mechanical, electrical, environmental and chemical test to the so designed batteries under standard regulations
REMARKS/SUGGESTION: NOT RECOMMENDED <ol style="list-style-type: none"> Lack of novelty in work. Objectives and deliverables not well defined. Related to manufacturing and maintenance of equipment 	

46	
Project No.	<u>SNTMOM/286/2020</u>
Project Title	Upgradation of Low Grade Chrome Ore Tailings to Increase Cr Fe ratio via Combined Pyro and Hydrometallurgical Route to Produce Low Carbon Ferrochrome
Institution	CSIR National Institute for Interdisciplinary Science and Technology
Principal Investigator	VENKATESAN J M: 8494935154 E-mail: venkatesanj@niist.res.in
Project Cost & Duration	Rs. 3534000.00 2Yrs
Objectives of the project	<p>The objective of the present proposal is to utilize the low grade chrome ore/tailings which is difficult-to-enrich by conventional beneficiation process.</p> <ul style="list-style-type: none"> To develop the low temperature reduction process (700 to 900oC) for upgradation of the Cr content from the low grade chrome ore (<35% Cr2O3) To evaluate the maximum chrome recovery by magnetic separation and accelerated rusting method from the reduced chrome ore tailings . To develop an alternate beneficiation process to increase Cr/Fe ratio to greater than 2.5 from < 1 • An attempt to make low carbon Ferro chrome (Cr-60% min, C-0.1% Max) from the upgraded low grade chrome ore/tailings To address the above objectives, the preliminary studies were carried out as a proof of concept. Low grade chrome ore tailings (Cr2O3 ~28%) from Orissa with low grade coal (FC ~45%) was reduced at 850oC and 950oC for 3 hours in reduction furnace. Initial results show the increase of Cr/Fe from ~0.59 to ~1.8. (Details in Annexure: pg 5-8).
REMARKS/SUGGESTION:	

NOT RECOMMENDED

1. The work has been already done
2. No novelty in this project
3. Objectives and deliverables not clear

47	
Project No.	<u>SNTMOM/296/2020</u>
Project Title	Genesis of Paddar Sapphire Deposit, J and K (India)
Institution	University of Jammu
Principal Investigator	Pankaj Kumar Srivastava 9419125574, pankajsrivastava.ju@gmail.com
Project Cost & Duration	Rs. 9996858.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • The Paddar sapphire deposit is globally known for its high-quality gem sapphire. It is hosted by the feldspar rich pegmatite which intrudes the dark coloured ultrabasic rock. Though known for more than a century, the genesis of the sapphire deposit is still debatable for the absence of detailed scientific data. • To fill this gap in scientific knowledge, the present research project aims at achieving the following objectives. • To understand the physicochemical evolution of the mineralizing fluid/melt responsible for the formation of sapphire at Paddar. • To comprehend the petrogenesis of pegmatite and ultrabasic rocks associated with the sapphire mineralization. • To propose a genetic model for the Paddar Sapphire deposit. To suggest future exploration strategies.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. Lack of Novelty and innovation 2. Similar work in the domain of GSI. 3. Will lead to duplication of work. 	

48	
Project No.	<u>SNTMOM/299/2020</u>
Project Title	Development of a Laboratory scale Universal Direct Chill casting set up for Aluminium alloys Billets and Slabs
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre
Principal Investigator	RAM NARAYAN CHOUHAN

	E-mail: rnchouhan@jnarddc.gov.in Mb. No. 9422124941
Project Cost & Duration	Rs. 16713400.00 Duration :2 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> To design and develop Laboratory scale universal Direct Chill (DC) casting set up for Aluminium alloys (Billets and Slabs) - round Billet: 150mmdia x 500 mm long - rectangular slab: 30mm X 100mm x 500mm To produce prototype billets of AA2014, AA6063 and slabs of AA3003, AA5083 alloys
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> Objective are different than the activity in the proposed of work. JNARDDC does not have design and engineering facility. Concept of DC Caster set up is more of a capacity building activity. 	

49	
Project No.	<u>SNTMOM/302/2020</u>
Project Title	Structural control on Iron ore and Gold mineralisation in Eastern part of Mahakoshal Belt, Madhya Pradesh
Institution	Indian Institute of Technology Roorkee
Principal Investigator	Sandeep Bhatt 7583947841 sandeep.bhatt@es.iitr.ac.in
Project Cost & Duration	Rs. 7020800.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> Mapping and investigating the micro to outcrop scale structures for movement of fluids. Characterisation of the micro to macro scale brittle to ductile features will reveal the paleo stress pattern and its control on the movement of fluids, which govern the enrichment process Identification of changes in Fe minerals using magnetic analysis and quantify the fluid flow dynamics. The mineralogical and spatial distribution of the magnetic minerals will reveal the direction and velocity of fluid flow. It will also expose the effects of fluid transport on Fe minerals, which is critical to put the knowledge of structural control and fluid flow into the perspective of local zones of enrichment. Establishing the structural control. Establishing the structural control is important to determine the subsurface distribution of the enrichment zones. This will also assist in future prospecting and will decrease the number of exploratory wells.
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> GSI is performing similar kind of work. GSI has already signed MoU with different IITs. 	

3. Lack of Novelty in work.

50	
Project No.	<u>SNTMOM/305/2020</u>
Project Title	Study of cut and fill, post pillar method of mining for the possibility of reducing the mining loss by optimising the ore pillars
Institution	Indian Institute of Technology ISM Dhanbad
Principal Investigator	Rabindra Kumar Sinha 9449247076 rksinha@iitism.ac.in
Project Cost & Duration	Rs. 46014530.00 3 yrs
Objectives of the project	<ul style="list-style-type: none"> The objective of the S&T Project is to minimise the mining losses and to optimise the overall recovery of the ore reserve which otherwise is lost permanently in the mined out stopes. Through this project it is also proposed to develop suitable guidelines for establishing the dimensions, spacing, support requirement etc. in post pillar cut and fill mining under varying geo-mining conditions
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> Objectives and deliverables not well defined. It's site specific work. Lacks innovation and novelty. 	

51	
Project No.	<u>SNTMOM/309/2020</u>
Project Title	Development of Low density Novel Al-Cr-Ni based High Entropy Alloy as Corrosion-resistant coatings for heavy-duty mining applications
Institution	Nitte Education Trust (R)
Principal Investigator	Aarti S. Bhatt E-mail: aartis@nitte.edu.in Mb. No. 9448871222
Project Cost & Duration	Rs. 5717976.00 Duration :3 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> The main goal of the proposed project proposal is to develop a novel high entropy alloy (HEA) as a corrosion-resistant material which can be employable as a stable coating material in mining related applications. The objectives are classified as below: To develop a novel Al-Cr-Ni high entropy alloy (HEA) of different elemental compositions by PVD evaporation technique.

	<ul style="list-style-type: none"> To evaluate the mechanical strength, stability and corrosion-resistance ability of the developed HEA coatings. To test, validate and demonstrate applicability of the developed HEA in mining applications by developing a suitable prototype.
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> There is no clarity about targeted mechanical properties of the material. High entropy alloy is repetitive work. Lack of novelty in the project. It is not translation work. PVD and vacuum based process is expensive and not scalable. Sterllite alloy could have been replaced with the existing alloy. Objectives and deliverables not well defined. 	

52	
Project No.	<u>SNTMOM/314/2020</u>
Project Title	Development of enhanced tribological surface for efficient hydraulic slurry transportation and energy conservation in mining applications
Institution	SardarVallabhbai National Institute of Technology Surat
Principal Investigator	Vivek Devidas Kalyankar 9510828842 vivekkalyankar@yahoo.co.in
Project Cost & Duration	Rs. 3810140.00 3yrs
Objectives of the project	<ul style="list-style-type: none"> To identify the root causes of various failure modes in centrifugal slurry pumps and slurry pipelines used for hydraulic transport systems in mining industries. To develop the nickel-based hardfacing on existing grades of stainless steel (AISI-304, AISI-316L) and mild steel substrate materials presently used in hydraulic transport systems To analyze the slurry erosive and abrasive wear characteristics of developed tribological surface and its comparison with existing grades of base materials To examine the microstructural alterations of nickel-based hardfaced surface and its correlation with the wear behavior of the developed surface. To compare the cost-effectiveness of the newly developed tribological surface with the existing materials in terms of enhanced service life and reduced maintenance cost. To minimize the energy consumption arising due to the friction and wear of mechanical equipment used in mining industries.
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> There are competitive and better technologies available for slurry transportation. Lack of novelty and research innovation. 	

53	
Project No.	<u>SNTMOM/318/2020</u>
Project Title	IoT based remote monitoring and early warning system for detection of unstable slopes and slope failures in the open-cast mines.
Institution	Aliah University
Principal Investigator	Quazimohmmadalfred 7001123646 quazi_alfred@yahoo.co.in
Project Cost & Duration	Rs. 4200460.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • In respect to world's mineral production, opencast mining is a very cost-effective mining method allowing a high grade of mechanization and large production volumes. In India, fast increase in output of various minerals can be largely attributed to rapid increase in opencast mining activities and intensified mechanization. • As a direct consequence, the amount of waste mining and dumping will also be commensurately very high thereby increasing the risks of highwall slope failures tremendously. • Under such situations, with most production areas concentrated close to the excavation floor, there is a constant danger to the men and machinery deployed thereat with a potential to cause catastrophic loss of life and property. • Thus, diligent monitoring of slopes for early warning signs are imperative to protect life and equipment .Objective of this project necessitates the development of latest IoT based effective slope monitoring systems for routine inspection of the rock and their deformation.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. Lack of novelty and its more of a conceptual project. 2. Similar technology is available in market. 3. Technology is already in use in open cast mines. 	

54	
Project No.	<u>SNTMOM/320/2020</u>
Project Title	Investigations on Laser assisted mining combined in-situ spectroscopy analysis for elemental identification
Institution	Indian Institute of Technology Indore
Principal Investigator	Palani I A 9009356097 palaniia@iiti.ac.in
Project Cost & Duration	Rs. 8002000.00 3yrs
Objectives of the project	<ul style="list-style-type: none"> • Application for Laser technology for drilling rocks samples reduces mining cost because of its higher transmission capabilities providing an alternative to conventional drilling and blast techniques. • In addition, mineral exploration industry requires new method and

	<p>tools to address the challenges of the mineral resources.</p> <ul style="list-style-type: none"> • Laser Induced spectroscopy can be considered as an emerging geotechnical tool for mineral exploration that can provide rapid in-situ compositional analysis and high-resolution imaging in both laboratories and field. • The Peculiar aspect of the Laser Induced spectroscopy has a capability to detect element with low atomic number. • A Technology of combining Laser assisted mining combined spectroscopy based elemental analysis will be highly interesting in the field of mining
<p>REMARKS/SUGGESTION: NOT RECOMMENDED</p> <ol style="list-style-type: none"> 1. Objectives and deliverables not clear 2. Lacks novelty and research innovation. 3. Concept is far from reality. 	

55	
Project No.	<u>SNTMOM/321/2020</u>
Project Title	Harnessing REE Mineralization britholite, allanite and associated REE-minerals of the Phenai Mata Igneous Complex, Gujarat A laboratory scale process development for REE enrichment
Institution	Government College of Engineering Karad
Principal Investigator	Abhijeet A. Bhondwe 0750701997 aa.bhondwe@gov.in
Project Cost & Duration	Rs. 3806250.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • The proposed project is focused at evaluating the mineralization potential of the layered gabbros and associated rocks of the Phenai Mata Igneous Complex, ChhotaUdepur District of Gujarat, with the aim of developing a protocol for low-cost extraction of the REE-carrier minerals phases namely britholite, allanite and synchysite; spelt explicitly under the following objectives • To evaluate the mineralization potential of the layered gabbros and allied rocks of the PMIC for commercial exploitation of the REE-minerals. • To establish a protocol for low-coast extraction of REE-rich mineral phases, namely, britholite, allanite and synchysiteoccurring in the PMIC.
<p>REMARKS/SUGGESTION: NOT RECOMMENDED</p> <ol style="list-style-type: none"> 1. Lack of Novelty and research innovation 2. Utility of the outcome could be insignificant 3. Similar work for REE already undertaken by various institutes 	

56	
Project No.	<u>SNTMOM/323/2020</u>
Project Title	Prospect-scale Target Generation for Concealed Orogenic Style Gold Mineralization in the Largely Soil Covered Dharwar-Shimoga Basin in Dharwad Haveri Districts, Dharwar Craton
Institution	DHARMASTHALA MANJUNATHESWWARA EDUCATIONAL SOCIETY (REGD))
Principal Investigator	Venkatraman S Hegde 9164718435 vshegde2009@gmail.com
Project Cost & Duration	Rs. 27090160.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • Evolve scientific concepts for target generation for gold exploration in the dominantly (80%) soil-concealed parts of the D-S Basin, particularly within the EDSB Auriferous Tract. • Come up with Multi-parametric Field Criteria for discovering gold anomalies and prospects within the EDSB. • Elucidate the structural control of gold mineralization in EDSB. • Understand the timing of mineralization to decipher the conditions favorable for gold deposition as well as use geochronological data as one of the tools for target generation. • Prioritisation of the known BIF-hosted gold Prospects and gold-anomalous locations for progressing them to gold Resource definition stage under UNFC G1 stage of Exploration. • Genetic Modelling of Gold mineralization in BIF and associated rock types. • To evolve SOP (Standard Operating Procedures) involving QA/QC for future exploration programmes in the D-S basin.
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. Objectives and deliverables not clear 2. Similar studies already in process. 3. It's a generic prospecting project. 4. Lacks novelty and research innovation. 	

57	
Project No.	<u>SNTMOM/326/2020</u>
Project Title	An Integrated Green electrochemical approach towards beneficiation-exfoliation of industrial graphitic waste and recovery of byproducts and evaluation of rGO as electrocatalyst for ORR
Institution	CSIR Central Electrochemical Research Institute
Principal Investigator	C NAVEEN KUMAR M: 9442608829

	E-mail: naveen@cecri.res.in
Project Cost & Duration	Rs. 13649300.00 2Yrs
Objectives of the project	Develop an electrochemical or an integrated chemical and electrochemical process to purify graphite concentrate (98-99%) and to recover value-added metal through selective anodic dissolution at 100 L scale. Analyze and quantify “Green hydrogen” generated at the cathode. Develop electrochemical reactors to purify graphite and produce reduced graphene oxide at a scale of 2 Kg per day. To evaluate the developed rGO as “metal-free” electrodes for oxygen reduction reaction (ORR) in aqueous electrolyte.
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. Lacks novelty and research innovation 2. No proof of concept 3. Objectives and deliverables not well defined. 	

58	
Project No.	SNTMOM/329/2020
Project Title	Development of apposite mine layout using Drop raise with Barrier pillars for safe and economical exploitation of narrow vein Metalliferous deposits
Institution	National Institute of Technology Rourkela
Principal Investigator	FALGUNI SARKAR 8986604709 sarkarf@nitrkl.ac.in
Project Cost & Duration	Rs. 4249200.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> • To mine out valuable minerals economically with marginal dilution and high percentage of ore recovery from narrow vein Metalliferous deposits • Development of mining method with less involvement of manpower, thus ensuring better safety • To design composite mine layout to minimize the cost of establishments, mine development cost and operational cost. • Reduction of environmental impact of Mining.
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. Concept is not clear as bulk mining method is being re-engineered and proposed for narrow vein deposit. 2. Lacks research innovation. 	

59	
Project No.	SNTMOM/334/2020

Project Title	Deep learning based Energy efficient and cost effective PV Based smart drone for land mining applications
Institution	K P R CHARITIES
Principal Investigator	Mohanasundaram K 9600047399 kumohanasundaram@gmail.com
Project Cost & Duration	Rs. 2623280.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> To design and develop an Deep learning based smart drone for monitoring and to provide optimal conditions for open mining. To develop LIDAR based terrain mapping and thermal imaging (deep learning based - DQN/RLN) to detect local minerals concentration in open ore. To provide energy savings in comparison to conventional systems using Photovoltaic (PV) based autonomous charging dock To study the characteristics and efficiency by Pilot plant implementation and test in the existing mine
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> No innovation and novelty. This Surveying technology is already in existence. 	

60	
Project No.	<u>SNTMOM/338/2020</u>
Project Title	Integrated Liquid-Liquid extraction with Phase Separation using Triple Helical Microreactor for Hydrometallurgy - Process Intensification Study through Simulations and Experiments
Institution	Indian Institute of Technology ISM Dhanbad, CSIR-Institute of Minerals and Materials Technology, Bhubaneswar - 751013
Principal Investigator	Soubhik Kumar Bhaumik Dr. Sambasiva Rao Ganneboyina (PI) Principal Scientist, Dept. of Hydro and Electrometallurgy Email: gsamba118@gmail.com E-mail: soubhikge@gmail.com Mb. No. 0947119239, +91-9437562468
Project Cost & Duration	Rs. 4760494.00 Duration: 3 Yrs, 0 Mth

Objectives of the project	<ul style="list-style-type: none"> Experiments on triple helical microreactor (THM) system for Cu ion extraction with aqueous sol. of Cu(II) ions as feed and LIX84 diluted with kerosene as solvent: exclusive setups for flow and extraction efficiencies. CFD modelling and simulations of flow and extraction process that includes devising strategies for i) detailed study of secondary flow patterns along with experimental validation using high speed imaging and particle image velocimetry and ii) comparison of mass transfer coefficient predicted with experimental results Optimization to achieve higher extraction efficiency and formulating correlations for mass transfer coefficients for different operating and geometrical parameters.
REMARKS/SUGGESTION: NOT RECOMMENDED <ol style="list-style-type: none"> Project work is of academic interest. It is not application oriented work. This is a not a translation R & D work. Lacks proof of concept. 	

61	
Project No.	<u>SNTMOM/347/2020</u>
Project Title	Dispersion pattern of trace and RE elements in Manganese Formations of different Geologic milieu, Odisha India
Institution	Ravenshaw University
Principal Investigator	PATITAPABAN MISHRA 8249381787 p_geology@yahoo.co.in
Project Cost & Duration	Rs. 2493200.00 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> Collection of representative Manganese Ore sample from different stratigraphic unit (on the basis of mode of occurrence and grade) and associated Mn-containing rocks To establish the dispersion pattern of trace & RE elements and their relative abundance in the above two categories of Ore samples and Mn-containing rocks. To establish preferential enrichment of trace/s & REE /s, if any, towards manganese, iron and / or clay mineral phases present in the above three categories of sample.
REMARKS/SUGGESTION: NOT RECOMMENDED <ol style="list-style-type: none"> The work is generic. Similar study already been conducted by various organisations. No novelty and research innovation. 	

62	
Project No.	<u>SNTMOM/351/2020</u>

Project Title	Development of Roof Fall Warning System for Underground Excavation vis-à-vis IoT based AI Enabled Real-time Smart Roof Sag Remote Monitoring System
Institution	Dinabandhu Foundation for Educational Research and Socio economic Development
Principal Investigator	Abhaya Kumar Samal 9437141314 abhaya@tat.ac.in
Project Cost & Duration	Rs. 5633282.88 3 Yrs
Objectives of the project	<ul style="list-style-type: none"> To monitor the ground behavior (GB) in real-time using appropriate Micro-Electro-Mechanical Systems (MEMS) Technology based electronic instrumentation, smart technology and Information and Communication Technology (ICT) based innovative approaches. To design and develop MEMS technology based AI Enabled Real-time Smart Roof Sag Remote Monitoring System for the underground metal mines (UGMM) for online monitoring to form the basis of an effective early warning system. Next, field study and performance monitoring of the RT-GBMS
REMARKS/SUGGESTION:	
NOT RECOMMENDED	
<ol style="list-style-type: none"> Similar technology is already available in the market No novelty and innovation in research 	

63	
Project No.	<u>SNTMOM/354/2020</u>
Project Title	Thermodynamics based design of Aluminum and Magnesium alloys containing REs through CALPHAD and ICME Approach
Institution	CSIR National Institute for Interdisciplinary Scicene and Technology
Principal Investigator	S. Savithri Email: ssavithri@niist.res.in Mb. No. 09446183238
Project Cost & Duration	Rs. 12136500.00 Duration: 3 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> Prediction of phase diagram of Al-Si-Mg alloys & Mg-Zn alloys based on CALPHAD approach for getting optimized composition of Al-Si-Mg and Mg-Zn alloy Prediction of phase diagram by systematic addition of Sc, Ce, to optimized Al-Si-Mg alloy and systematic addition of Gd to optimized Mg-Zn using CALPHAD approach. Microstructure simulation using MICRESS software for Sc, Ce-added Al-Si-Mg alloys and Gd added Mg-Zn alloys to understand the influence of the alloying elements and optimizing the alloy

	<p>composition Gravity casting of optimized composition of Sc, Ce added Al-Si-Mg alloy and Gd added Mg-Zn alloy and validation with simulated results for the microstructures.</p> <ul style="list-style-type: none"> • Detailed characterization of cast alloys through SEM, TEM, EDAX, optical microscope tec. • Experimental evaluation of mechanical properties & tribological properties of the optimized alloys Generation of thermophysical properties of these alloys
<p>REMARKS/SUGGESTION: NOT RECOMMENDED</p> <p>1) Project is bottoms up based approach and budget is directed towards capacity building in software. 2) Lack of novelty and research innovation. 3) Identified product in dental alloy is not appropriate.</p>	

64	
Project No.	<u>SNTMOM/365/2020</u>
Project Title	Economical and Environmentally Extraction of Rare Earth Elements from Lignite Coal and Its Byproduct
Institution	Panjab University
Principal Investigator	<p>Debabrata Das</p> <p>Email: debabratadas@pu.ac.in</p> <p>Mb. No.7087097510</p>
Project Cost & Duration	<p>Rs. 8991952.00</p> <p>Duration: 3 Yrs, 0 Mth</p>
Objectives of the project	<ul style="list-style-type: none"> • The main objectives of the proposed research are: 1. To assess in details of all Rare Earth Elements (La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Em, Yb, Lu) and Sc, Y in Lignite coal, overburden and lignite combustion products • To develop suitable leaching tests methods and conduct series of aqueous leaching experiments for understanding and estimation of the extraction behaviour of the rare earth elements (REEs) • To develop physical separation techniques to enrich of rare earth elements from lignite coal and lignite combustion products • To estimate extractable reserves of Rare Earth Elements (REEs) resources in three acting mining areas when total REEs concentrations greater than 500 mg/kg.
<p>REMARKS/SUGGESTION: NOT RECOMMENDED</p> <p>1) There is no clarity about Adopted Methodology and deliverables.</p>	

<p>2) Research component is not mentioned in the proposed work. 3) Problem definition is not properly defined. 4) Flow sheet is not properly explained.</p>

65	
Project No.	<u>SNTMOM/366/2020</u>
Project Title	Bioleaching of Rare Earth Elements from bauxite mines of Kachchh, Gujarat :A prospective cost effective technology for exploration of REE for industrial applications
Institution	GUJARAT INSTITUTE OF DESERT ECOLOGY
Principal Investigator	K KARTHIKEYAN Email: karthikmicrobio@gmail.com Mb. No.8141276926
Project Cost & Duration	Rs. 13333656.00 Duration: 3 Yrs, 0 Mth
Objectives of the project	<ul style="list-style-type: none"> • Reconnaissance survey in the mines of Kachchh and to identify potential mines for exploration of rare earth elements from bauxite mines of Kachchh and complete mapping of the area to highlight the current scenario of REE in Kachchh . • Characterizing the possible minerals and quantification of REE's in the bauxite residues and the mineralogical characterization of the samples using XRD and SEM. • To isolate the total heterotrophic microorganisms from the mine soils and mine tailings and its application in the removal of gangue minerals. • To further study the microbial community structure via metagenome of mine soil and mine tailings. • To study the effect of bioprocess variables in bioleaching experiments and to study the bioaccumulation and interactions of the REE and the cultures. • To evaluate REE for their photocatalytic activities for further applications. • To understand the economic evaluation of the optimized technology in bioleaching of REE • Reconnaissance survey in the mines of Kachchh and to identify potential mines for exploration of rare earth elements from bauxite mines of Kachchh and complete mapping of the area to highlight the current scenario of REE in Kachchh . • Characterizing the possible minerals and quantification of REE's in the bauxite residues and the mineralogical characterization of the samples using XRD and SEM. •

REMARKS/SUGGESTION:

NOT RECOMMENDED

- 1) Preliminary work is to be done for bauxites collected from different region.
- 2) Mining region is to be identified for knowing the concentration of REE.
- 3) Lacks novelty and research innovation.

66	
Project No.	<u>SNTMOM/369/2020</u>
Project Title	Development of Mineral Specific Spectral Database and Application of Raman Spectroscopy in Minerology
Institution	Indian Association for the Cultivation of Science
Principal Investigator	Subhadeep Datta 9748285438 subhanano@gmail.com
Project Cost & Duration	Rs. 8940000.00 2 Yrs
Objectives of the project	<ul style="list-style-type: none"> • Detailed field studies in and around the red sand deposits for understanding the mode of occurrence of red sand beds, connecting river/stream channels, and link with country rocks • Characterize the various minerals present in the red sand deposits using major, trace and REE chemistry, hyperspectral radiometer, Laser Raman spectrometer, XRD, FTIR, SEM and EPMA • U-Pb geochronology of detrital zircon/monazite grains from selected red sand beds and connecting river sand deposits to understand depositional ages • Quantitatively estimate the economic grade (quality) of the heavy mineral deposits associated with the red sand beds using spectral and chemical techniques • Understand the source by comparing the geochemical characteristics and the radiometric ages of sand deposits and various lithologies in the hinterland of study areas • Chart out the paleoclimatic conditions of deposition and its relationship to past tectonic/climatic processes in the study areas.

REMARKS/SUGGESTION:

NOT RECOMMENDED

1. Purely theoretical work and not linked to mining.
2. End utility is not clear.

67	
Project No.	<u>SNTMOM/377/2020</u>

Project Title	Development of Novel and Green Process for Recovery of Metals from Copper Ores and E-waste
Institution	Indian Institute of Technology Delhi
Principal Investigator	KAMAL KISHORE PANT M: 9990662905 E-mail:kkpant@chemical.iitd.ac.in
Project Cost & Duration	Rs. 15433020.00 3 Yrs
Objectives of the project	The main objective of the proposal is to develop a novel and green process for the recovery of metals from copper ores and electronic waste, and setup of 50 kg/day pilot plant for metal recovery. Specific objectives of the project are as follows: 1. Collection and characterization of copper ore and e-waste. 2. Pre-treatment of ores and e-waste for concentrating metal fraction 3. Exploring the application of DES and low temperature roasting for metal recovery, and optimization of process parameters 4. Selection of greener and economically efficient process 5. Design and setup of 50 kg/day capacity pilot plant for processing e-waste and ore to recover metals.
REMARKS/SUGGESTION: NOT RECOMMENDED	
<ol style="list-style-type: none"> 1. The Cu tailings (mine waste) and E-wastes(urban waste) are two different sources and cannot be combined from the point of view operation. Reject from Cu-tailings after froth floatation is an additional issue to be dealt with. 2. Project may be good from the perspective of e-waste disposal but that is dealt with MIT, Govt. of India not in the purview of MOM. 3. PI should undertake preliminary work with Hindustan copper limited to evaluate proof of concept for Cu recovery from Cu tailing. 4. Objectives and deliverables are not well defined. 	

68	
Project No.	<u>SNTMOM/394/2020</u>
Project Title	Dewatering of Mine Tailings Using Super Absorbent Polymer System
Institution	Mahatma Gandhi University Kottayam Kerala
Principal Investigator	Sabu Thomas M: 9447223452 E-mail: <u>sabuthomas@mgu.ac.in</u>
Project Cost & Duration	Rs. 4948500.00 3 Yrs

Objectives of the project	<ul style="list-style-type: none">• To prepare a highly cross linked and insoluble non ionic polyacrylamide, anionic highly cross linked sodium salt cross linked polyacrylic acid and a low molecular weight cellulose and high molecular weight polyacrylamide, which can analyse ion exchange capacity of the three systems and the magnitude of zeta potential to understand the strength of the flocs.• To study the relation of polymer architecture on the floc strength and minimum dosage required.• To analyse the settling time, using dewatering tests and study the polymer adsorption characteristics• To understand the regeneration properties of the superabsorbent polymer system using a pH control and temperature controlled system• Value addition by publishing in peer reviewed journals and patenting.
<p>REMARKS/SUGGESTION:</p> <p>NOT RECOMMENDED</p> <ol style="list-style-type: none">1. Lacks novelty and research innovation2. No proof of concept.	

7. REVIEW OF COMPLETED / ONGOING PROJECTS

A total of 38 ongoing projects were reviewed which include 9 completed projects & 29 ongoing projects.

The following projects were reviewed by the PERC and recommendations are as below:-

COMPLETED – 9 nos.

1)	
File No.	14/74/2016-Met.IV
Project Title	Technology Development (TRL-7) for calico-thermic reduction of rare earth metal oxides and establishment of pilot plant for extraction and purification of samarium
Institution	Non Ferrous Material Technology Development Centre (NFTDC), Hyderabad
Principal Investigator	Dr.Hareesha Iddya, Dr Tayagarajan E-mail:-hareesha@nftdc.res.in Mb. No.9833110641
REMARKS/SUGGESTION:	
COMPLETED	
<ol style="list-style-type: none"> 1. The final findings were reviewed and report was accepted. 2. The committee appreciated the work carried out. A one page write up on the outcome of this project should be submitted to Ministry of Mines 3. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 4. PI informed that final draft report and UC already submitted. 5. Final report of the project is recommended for acceptance and closure of the project by SSAG. 	

2)	
Project No.	14/51/2014-Met-IV
Project Title	Development of Nickel containing steel from chromite over burden
Institution	Indian Institute of Technology, Kharagpur and Institute of Minerals & Materials Technology, Bhubaneswar (Jointly)
Principal Investigator	Prof. Siddhartha Das Email:-sdas@metal.iitkgp.ernet.in Dr. B. Bhoi, E-mail:-bbhoi@immt.res.in
REMARKS/SUGGESTION:	
COMPLETED	

<ol style="list-style-type: none"> 1. The final findings were reviewed and report was accepted. 2. The committee appreciated the work carried out. 3. A one page write up on the outcome of this project should be submitted to Ministry of Mines which should include the cost evaluation of technology. 4. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 5. Final report of the project is recommended for acceptance and closure of the project by SSAG.

3)	
Project No.	14/7/2017-Met-IV
Project Title	Processed Sea sand for construction and other purposes
Institution	Civil Engineering Department, Saveetha Engineering College, Saveetha Nagar, Thandlam, Chennai
Principal Investigator	Shri Sudharson G, Dr Aronachalam Lakshmanan M: 9003533904, 8925032573 E-mail:sudharson@saveetha.ac.in

REMARKS/SUGGESTION:

COMPLETED

1. The final findings were reviewed and report was accepted.
2. The committee appreciated the work carried out.
3. A one page write up on the outcome of this project should be submitted to Ministry of Mines and PI should also explore the possibility of obtaining CPWD certificate for the utilization of the product.
4. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure.
5. Final report of the project is recommended for acceptance and closure of the project by SSAG.

4)	
Project No.	14/7/2018-Met-IV
Project Title	Novel Approach to Recover Individual Valuable Heavy Minerals from Pyriboleferrous Beach and Dune Sand Deposits
Institution	CSIR-Institute of Minerals & Materials Technology, Bhubaneswar
Principal Investigator	Dr. C Eswariah E-mail:eswar@immt.res.in
REMARKS/SUGGESTION:	

COMPLETED

1. The final findings were reviewed and report was accepted.
2. A one page write up on the outcome of this project should be submitted to Ministry of Mines
3. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure.
4. Final report of the project is recommended for acceptance and closure of the project by SSAG.

5)	
Project No.	14/4/2017-Met-IV
Project Title	Nano Processing of Industrial Rejects for use as additives in Mix designs for improved pozzolanic reaction efficiency
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur and VNIT, Nagpur
Principal Investigator	Dr Priyanka Nayar E-mail: priyankanayar_26@yahoo.co.in , Dr Mangesh Madurwar E-Mail: mangesh_bits@yahoo.com
REMARKS/SUGGESTION:	
COMPLETED	
<ol style="list-style-type: none"> 1. The final findings were reviewed and report was accepted. 2. The committee appreciated the work carried out. A one page write up on the outcome of this project should be submitted to Ministry of Mines 3. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 4. Final report of the project is recommended for acceptance and closure of the project by SSAG. 	

6)	
Project No.	14/49/2014-Metal IV
Project Title	Study of Alkaline -Carbonatite complexes as potential resources for REEs, Nb-Ta and U-Th.
Institution	IIT Roorkee
Principal Investigator	Amit Kumar Sen Email: senakfes@gmail.com
REMARKS/SUGGESTION:	

COMPLETED

1. The final findings were reviewed and report was accepted.
2. A one page write up on the outcome of this project should be submitted to Ministry of Mines
3. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure.
4. Final report of the project is recommended for acceptance and closure of the project by SSAG.

7)

Project No.	14/39/2015-Met.IV
Project Title	Assessment and prediction of land surface deformation due to underground metal mining in northern aravali range of hills using microwave remote sensing data sets and ground based Observations
Institution	IIT, Dhanbad (Indian School of Mines), Jharkhand
Principal Investigator	Shri Dheeraj Kumar, No : 9431711199 Email:- dheeraj@dkumar.org dt@ismdhanbad.ac.in

REMARKS/SUGGESTION:

COMPLETED

1. The final findings were reviewed and report was accepted.
2. The committee appreciated the work carried out. A one page write up on the outcome of this project should be submitted to Ministry of Mines
3. PI asked to submit letter from Hindustan Copper Ltd. to establish the credibility of the work
4. PI informed that no additional fund is required and unspent money has been returned to Ministry of Mines.
5. Final report of the project is recommended for acceptance and closure of the project by SSAG.

8)

Project No.	14/41/2015-Met.IV
Project Title	Study the feasibility of treatment of seepage water from chromite mine quarries of Odisha
Institution	National Institute of Technology, Rourkela
Principal Investigator	Dr. (Mrs) Susmita Mishra, 9438246601 smishra@nitrkl.ac.in Smishra1234@gmail.com

REMARKS/SUGGESTION:

COMPLETED

1. The final findings were reviewed and report was accepted.
2. A one page write up on the outcome of this project should be submitted to Ministry of Mines

3. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure.
4. Final report of the project is recommended for acceptance and closure of the project by SSAG.

9)	
Project No.	14/8/2019-Met-IV
Project Title	Optimization of digestion efficiency in Bayer process by ascertaining the ideal size fraction of bauxite feed.
Institution	Jawaharlal Nehru Aluminium Research Development & Design Centre, JNARDDC, Nagpur
Principal Investigator	S.B. Rai Principal Scientist 9423680346 Email-suchitarai1968@gmail.com, suchitarai@jnarddc.gov.in,
REMARKS/SUGGESTION:	
COMPLETED	
<ol style="list-style-type: none"> 1. The final findings were reviewed and report was accepted. 2. The committee appreciated the work carried out. A one page write up on the outcome of this project should be submitted to Ministry of Mines 3. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 4. Final report of the project is recommended for acceptance and closure of the project by SSAG. 	

ONGOING – 28 nos.

1)	
File No.	14/6/2017-Met-IV
Project Title	Fabrication of Advanced Ceramic Nano-coatings for Automotive Applications
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur and Christ University
Principal Investigator	Dr Parvati Ramaswamy Dr Priyanka Nayar Email: Parvati.ramaswamy@christuniversity.in E-Mail:priyankanayar_26@yahoo.co.in Mb. No.9980841830
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1) Progress was satisfactory. 2) Proposed objectives were duly met. 3) Based on the request of PI, PERC recommended timeextension upto June2021 due to COVID-19. 4) Recommended to release next installment / balance funds subject to submission of 	

utilization certificates and statement of expenditure

2)	
File No.	14/19/2018-Met-IV
Project Title	Techno-economic Survey of Aluminium Scrap Recycling in India
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur and MRAI
Principal Investigator	Mr. RN Chouhan, Pr Scientist, JNARDDC
REMARKS/SUGGESTION: ONGOING	
<ol style="list-style-type: none"> 1) Progress was satisfactory. 2) Based on the request of PI, PERC recommended time extension upto March 2021 due to COVID-19. 3) Recommended to release next installment / balance funds subject to submission of utilization certificates and statement of expenditure 	

3)	
File No.	14/5/2019-Met-IV
Project Title	Process Feasibility studies for the development of High Purity Aluminium through segregation process
Institution	Nonferrous Materials Technology Development Centre ,NFTDC, Hyderabad
Principal Investigator	Lokeswara Rao, Project Director Email: lokesh@nftdc.res.in Phone : 040-24342300, 2418 2372 Mobile : 9849604852
REMARKS/SUGGESTION: ONGOING	
<ol style="list-style-type: none"> 1) Conventional zone refining has to be compared. 2) Committee appreciated work in the project. 3) Based on the request of PI, PERC recommended time extension upto June 2021 due to COVID-19 and floods. 4) Recommended to release next installment / balance funds subject to submission of utilization certificates and statement of expenditure 	

4)	
File No.	14/6/2019-Met-IV

Project Title	Processing of spent and natural graphite for energy and aerospace application
Institution	Institute of Minerals & Materials Technology, IMMT, CSIR, Bhubaneswar
Principal Investigator	Mamata Mohapatra (Sr. Scientist) CSIR-IMMT, Mail- mamata@immt.res.in M- +919437260688
REMARKS/SUGGESTION: ONGOING	
<ol style="list-style-type: none"> 1) PI advised to focus on carbon making process for spent graphite as a benchmark 2) PI advised to use natural or commercially available graphite. 3) Based on the request of PI, PERC recommended time extension of 6 months due to COVID-19. 4) Recommended to release next installment of funds subject to submission of utilization certificates and statement of expenditure 	

5)	
File No.	14/7/2019-Met-IV
Project Title	Production and certification of certified reference materials (CRMs) for the analysis of aluminium alloy
Institution	Jawaharlal Nehru Aluminium Research Development & Design Centre, JNARDDC, Nagpur
Principal Investigator	R. N. Chouhan, Principal Scientist Email id: rnchouhan@jnarddc.gov.in Telephone: 07104- 220017, 220476
REMARKS/SUGGESTION: ONGOING	
<ol style="list-style-type: none"> 1) PI should cap the process by die casting 2) One CRM should be used against the other for the project work. 3) Homogeneity should be checked by bench marking 4) Based on the request of PI, PERC recommended time extension of 6 months due to COVID-19 5) Recommended to release next installment of funds subject to submission of utilization certificates and statement of expenditure 	

6)	
File No.	14/13/2019-Met-IV
Project Title	Direct production of Fe-Cr-Ni-Mn stainless alloy from mine waste by thermal plasma process

Institution	Institute of Minerals & Materials Technology, IIMT, CSIR Bhubaneswar
Principal Investigator	Dr. A.K. Chaubey Principal Scientist E-mail: akchaubey@immt.res.in , anil.immt@gmail.com Ph:(0674) 2379204 (O), 09438090232
REMARKS/SUGGESTION: ONGOING	
<ol style="list-style-type: none"> 1) Progress was satisfactory. 2) Based on the request of PI, PERC recommended time extension of 6 months due to COVID-19 3) Recommended to release next installment of funds subject to submission of utilization certificates and statement of expenditure 	

7)	
File No.	14/14/2018-Met-IV
Project Title	High performance of rare earth metal as Electrode material for super-capacitor application and fuel cell
Institution	Velammal Institute of Technology, Panchetti, Chennai
Principal Investigator	Dr. V. Sindhu E-mail:- sindhusrini@gmail.com M: 9940144993
REMARKS/SUGGESTION: ONGOING	
<ol style="list-style-type: none"> 1) Progress was found to be satisfactory. 2) Based on the request of PI, PERC recommended time extension upto March 2021 due to COVID-19. 3) Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure 	

8)	
File No.	14/15/2018-Met-IV
Project Title	Development of open cell aluminium foams for heat sink and EMI shielding Application
Institution	Advanced Materials and Processes Research Institute (AMPRI), Bhopal
Principal	Dr. D. P. Mondal

Investigator	E-mail:-mondaldp@yahoo.com M: 9425649951
REMARKS/SUGGESTION: ONGOING	
<ol style="list-style-type: none"> 1) Progress was found to be satisfactory. 2) Based on the request of PI, PERC recommended time extension of 6 months due to COVID-19. 3) Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure 	

9)	
File No.	14/29/2018-Met-IV
Project Title	Development of capacitive deionization technology for the extraction of germanium and selenium: Two elements of strategic relevance
Institution	IIT, Madras, Chennai
Principal Investigator	Professor T.Pradeep E-mail:-pradeep@iitm.ac.in
REMARKS/SUGGESTION: FORECLOSURE	
<ol style="list-style-type: none"> 1) Work carried out was appreciated. 2) Ministry has released the first installment of funds. 3) The findings revealed the absence of sufficient germanium and selenium. 4) No further funds need to be released and PI advised to submit UC and statement of expenditure. 5) In view of the above, PERC recommended to the SSAG to accept the closure of the project. 	

10)	
Project No.	14/31/2018-Met-IV
Project Title	Recovery of scandium metal from acid leach liquor from titanium mineral industries
Institution	CSIR-National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram-695019
Principal Investigator	Dr. M. Sundararajan E-mail:rajanmsundar77@yahoo.com
REMARKS/SUGGESTION:	

ONGOING

1. Progress was satisfactory.
2. Based on the request of PI, PERC recommended for time extension of one year due to COVID-19.
3. PI advised to carry out mass balance of scandium
4. Recommended to release balance funds / next installment subject to submission of utilization certificates and statement of expenditure

11)	
Project No.	14/17/2018-Met-IV
Project Title	To study the fire retardancy of nano-ATH in polymers
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur and CIPET
Principal Investigator	Dr. Suchita Rai, Pr Scientist, JNARDDC
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress was satisfactory. 2. Based on the request of PI, PERC recommended for time extension of 6 months due to COVID-19. 3. PI should explore the possibility of use of the technology by relevant agency. 4. Recommended to release balance funds / next installment subject to submission of utilization certificates and statement of expenditure 	

12)	
Project No.	14/4/2019-Met-IV
Project Title	Recovery Studies of Gold and other values using non cyanide reagents from Tailing Dump of Bharat Gold Mines Ltd
Institution	Nonferrous Materials Technology Development, NFTDC, Hyderabad
Principal Investigator	B.R.V. Narasimhan, Principal Scientist M: 9908648717 E-mail:narasimhan@nftdc.res.in
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress was satisfactory and work was highly appreciated. 2. PI informed that the project shall be completed within its schedule date. 	

3. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure.

13)	
Project No.	14/9/2019-Met-IV
Project Title	Utilization of aluminium dross to achieve zero waste – A bench scale study
Institution	Jawaharlal Nehru Aluminium Research Development & Design Centre, JNARDDC, Nagpur CSIR-National Environmental Engineering Research Institute, Nagpur
Principal Investigator	Upendra Singh Principal Scientist, Bauxite Division M: 9422980366,9890191849 E-mail: Upendra1970@gmail.com Ganesh R Kale, Solid and Hazardous Waste Management Division M: 9823810159 E-mail: gr_kale@neeri.res.in
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. PI has successfully achieved the lab scale process and bench scale is under progress. 2. Progress was satisfactory and work was appreciated. 3. Based on the request of PI, PERC recommended for time extension upto June 2021 due to COVID-19. 4. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 	

14)	
Project No.	14/10/2019-Met-IV
Project Title	Value addition of calcined bauxite for possible use as abrasives in waterjet cutting applications
Institution	SSN College of Engg, Chennai
Principal Investigator	V.E. Annamalai Professor & Head, M: 9840359093 E-mail: annamalaive@ssn.edu.in
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress was satisfactory. 2. Based on the request of PI, PERC recommended for time extension by six months due to COVID-19. 3. Recommended to release balance funds subject to submission of utilization certificates 	

and statement of expenditure.

15)	
Project No.	14/14/2019-Met-IV
Project Title	Identification and Investigation of efficacy of potential biochemical molecules for extraction of gold and other noble metals from tailings and waste sources
Institution	Indian Institute of Technology, IIT Madras
Principal Investigator	Prof. T. Pradeep Institute Professor Department of Chemistry M: 9445560767, +91 44 2257 4208, Fax: +91 44 22570509 E-mail:pradeep@iitm.ac.in
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress was satisfactory. 2. PI presented the pilot scale facility established in the project. 3. PI informed that the project is likely to be completed within schedule date 4. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 	

16)	
Project No.	14/18/2018-Met-IV
Project Title	Investigation of the dynamics & mechanism of flocculation by polymers and biopolymers for separation of solid particles of high rate thickeners in mineral processing industries
Institution	CSIR- National Institute for Interdisciplinary Science and Technology
Principal Investigator	Dr. Lakshmi Rakesh Kumar Yasarla E-mail:yasarla.rakesh@gmail.com
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress was satisfactory. 2. PI was advised to explore the use of developed flocculant for ores 3. Based on the request of PI, PERC recommended for time extension by six months due to COVID-19. 4. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 	

17)	
Project No.	14/24/2018-Met-IV
Project Title	Bench scale study on extraction of pure Silica and smelter grade Aluminium Fluoride from Coal Fly Ash (CFA)
Institution	JNARDDC, Nagpur
Principal Investigator	Shri Manoj T. Nimje M: 7544907445 E-mail: mantukni@gmail.com
REMARKS/SUGGESTION: ONGOING <ol style="list-style-type: none"> 1. Progress was reviewed and found to be satisfactory 2. Based on the request of PI, PERC recommended for time extension upto March 2021 due to COVID-19. 3. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 	

18)	
Project No.	14/8/2015-Met.IV
Project Title	Enhanced recovery of Manganese as electrolytic manganese dioxide (EMD) from Ferro Manganese mine tailings through bioleaching
Institution	Siksha O Anusandhan University ,Bhubaneshwar
Principal Investigator	Dr.Sanghmitra Nayak. E-mail: Sanghamitran24@gmail.com
REMARKS/SUGGESTION: ONGOING PI was absent	

19)	
Project No.	14/12/2017-Met-IV
Project Title	Critical Mineral (non-fuel) Resources Index of India- for effective policy decisions on mineral and manufacturing sector of India
Institution	Council of Energy Environment and Water(CEEW), Thapar House, Janpath, New Delhi

Principal Investigator	Shri Vaibhav Gupta, Email:-vaibhav.gupta@ceew.in
REMARKS/SUGGESTION: ONGOING PI was absent.	

20)	
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Project No. 14/75/2015-Met.IV
 Project Title Rare earth mineral concentration in the beach sands of uttarakannada coast: their economic viabilities and sustainable mining
 Institution SDM college of Engineering & Technology, Dhavalagiri, Dharwad
 Principal Dr. V. S. Hegde
 Investigator 9164718435
 Email:-vshegde2001@gmail.com

MARKS/SUGGESTION:

ONGOING

1. The project completion date was Dec 2019. PI requested for time extension due to COVID-19.
2. Committee accepted the request and asked to submit the final project report by 31st January, 2021.
3. Committee advised PI to provide the map with concentrated HREEs areas in final report.
4. PI asked to provide recommendation related to scope of mining as it will be helpful for Karnataka DGM for mining lease purpose.

21)	
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Project No. 14/30/2018-Met-IV
 Project Title Treatment of Acid Mine Drainage for Heavy Metal Removal
 Institution IIT, Mandi, Kamand Campus, VPOKamand
 Principal Dr. Sumit Sinha Ray
 Investigator 9748159620
 E-mail:-sumitsinha@iitmandi.ac.in

REMARKS/SUGGESTION:

ONGOING

1. Progress was satisfactory.
2. Based on the request of PI, PERC recommended for time extension upto March 2021 due to COVID-19.
3. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure.

22)	
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Project No. 14/12/2019-Met-IV

Project Title Development of Novel Nanoporous hollow Fibre membrane based unit for the effective treatment of Mine waste water
 Institution National Institute of Technology Karnataka, NIT Surathkal
 Principal Prof. Arun M. Isloor Membrane Technology Laboratory, Prof &Head of
 Investigator Department, Department of Chemistry, National Institute of Technology Karnataka, Surathkal, Mangalore E-mail:isloor@yahoo.com Ph: 9448523990

REMARKS/SUGGESTION:

ONGOING

1. The project was recommended for a duration of 6 months with a seed amount of Rs.5 Lakhs out of which only Rs. 3.75 Lakhs was received.
2. The fabrication of equipment and preliminary studies are still pending due to wants of funds and COVID-19.
3. PI was advised to contact Shri Abhay Kumar Singh, CIMFR for collaboration to avoid repetition of work.
4. Recommended to release balance seed money subject to submission of utilization certificates and statement of expenditure.
5. Based on the request of PI, PERC recommended for time extension upto June 2021 due to COVID-19.

23)	
Project No.	14/3/2017-Met-IV
Project Title	Development of a novel underground mining method for exploitation of Chromite deposits from friable ore body and host rocks of Sukinda Valley, Odisha
Institution	Department of Mining Engineering, IIT, Kharagpur
Principal Investigator	Shri Abhiram Kumar Verma, No: 9476433770, 9547859609 E-mail:-akverma@mining.iitkgp.ac.in, abhiram.verma@gmail.com
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress was satisfactory. 2. Based on the request of PI, PERC recommended for time extension upto June 2021 due to COVID-19. 3. PI was advised to contact Shri ChandraniVerma, CIMFR Nagpur for guidance in carrying out similar work. 4. Recommended to release balance funds / next installment subject to submission of utilization certificates and statement of expenditure 	

24)	
Project No.	14/8/2018-Met-IV
Project Title	Use of Overburden Clay as alternate for aggregate
Institution	Indian Institute of Technology Madras Chennai
Principal Investigator	Dr. K. Ramamurthy, No : 9445391265 E-mail:-vivek@iitm.ac.in

REMARKS/SUGGESTION:

ONGOING

1. Progress was satisfactory.
2. PI informed that the final report will be submitted on time i.e Dec 2020 within sanctioned budget amount.
3. Recommended to release balance funds / next installment subject to submission of utilization certificates and statement of expenditure

25)	
Project No.	14/23/2018-Met-IV
Project Title	Assessment of Udaipur rock phosphate, low grade potassium feldspar and lignite mine waste for the development of organo-mineral fertilizer formulations
Institution	ICAR- Central Arid Zone Research Institute, Near ITI Circle, Jodhpur, Rajasthan
Principal Investigator	Dr. Praveen Kumar E-mail:-praveenkumar@icar.gov.in No: 9460249988, 9509883432

REMARKS/SUGGESTION:

ONGOING

1. Progress was satisfactory.
2. PI has complied with the suggestions of last review committee
3. Based on the request of PI, PERC recommended for time extension upto Dec 2021 due to COVID-19.
4. Recommended to release balance funds / next installment subject to submission of utilization certificates and statement of expenditure

26)	
Project No.	14/27/2018-Met-IV
Project Title	Integrated Geological, Geochemical and Geophysical studies for the delineation of Chromitite extensions in Nuggihalli Schist Belt and implications for Ni-Cu+-PGE mineralization
Institution	CSIR- National Geophysical Research Institute and IISC, Bangalore
Principal Investigator	Dr. P. V. SunderRaju No :9490748152 E-mail:-perumala.raju@gmail.com Dr. Sajeiv Krishnan E-mail:-krishnansajeiv@gmail.com

REMARKS/SUGGESTION:

ONGOING

1. Progress was satisfactory.
2. The last review committee had advised PI to prepare roadmap to link geophysics, geology and geochemistry of mineral deposit.
3. The PI is in process of roadmap preparation and presented a part of geological and structural map already prepared.

4. Based on the request of PI, PERC recommended for time extension upto Dec 2021 due to COVID-19.
5. Recommended to release balance funds / next installment subject to submission of utilization certificates and statement of expenditure

27)	
Project No.	14/28/2018-Met-IV
Project Title	Development of grapheme based membranes from graphite ore for desalination
Institution	CSIR- National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram and CSIR-NML, Madras, Chennai
Principal Investigator	Dr.(Mrs.) Sreeja Kumari S.S., No : 9442217259 E-mail:-sreejakumari@niist.res.in, sreejakumariss@gmail.com Mrs. N. Vasumathi E-mail:-tvvk65@yahoo.com Dr T V Vijaya Kumar No: 9444914590
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress was satisfactory. 2. Based on the request of PI, PERC recommended for time extension upto June 2021 due to COVID-19. 3. Recommended to release balance funds / next installment subject to submission of utilization certificates and statement of expenditure 	

28)	
Project No.	14/11/2019-Met-IV
Project Title	Mineral chemistry, isotope geochemistry, geochronology, and metallogeny of rare and rare-earth metals present in the alkaline-carbonatite complexes associated to the Narmada-Son rift zone, western India
Institution	Banaras Hindu University, BHU, Varanasi
Principal Investigator	Dr. Amiya Kumar Samal; Department of Geology, Institute of Science, Banaras Hindu University, Varanasi Contact Details: amiyasamal007@gmail.com; Mob-9580270209
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. The first phase of the project was sanctioned with a seed money of ₹ 14.99 lakhs for 9 months for undertaking desk studies, collection of field samples, identifying mineral phases and chemical analysis. 2. PI is advised to speed up the work and ensure utilization of already released amount. 3. Based on the request of PI, PERC recommended for time extension upto Sept 2021 due to COVID-19. 	

29)	
Project No.	14/6/2018-Met-IV

Project Title	Development of a Low-cost Portable Optical Reflectance Spectrometer for Mining and Mineralogy
Institution	Indian Institute of Technology, Madras
Principal Investigator	Dr. Sivarama Krishanan 9444224291 srkrishnan@iitm.ac.in
REMARKS/SUGGESTION: FORECLOSURE <ol style="list-style-type: none">1. The final findings were reviewed.2. Last review committee had suggested to close the project due to lack of applicability to minerals to have proof of concept3. PERC recommends closure of the project with submission of utilization certificate and release of any residual dues within the sanction project cost.	

8 In view of the COVID-19 pandemic, the committee recommended for a general time extension of 1 year for all ongoing projects.

The PERC meeting concluded with thanks to the chair, members and the experts.

**LIST OF PARTICIPANTS OF 20TH PERC MEETING HELD THROUGH VC
DURING 23-25 November 2020**

Sr no	Name	Portfolio
1.	Shri Satendra Singh Joint Secretary (Mines), Delhi	Chairman
2.	Shri Sanjeev Verma Director (Mines), Delhi	Member
3.	Dr. Pradeep Singh Director Technical (Mines), Delhi	Member
4.	Shri A. R. Sengupta Dy Secretary, IFD (Mines), Delhi	Member
5.	Prof. T.C. Rao Ex. Director, RRL Bhopal	Member
6.	Prof S.P. Mehrotra IIT, Gandhinagar	Member
7.	Dr. K. Balasubramanian Director, NFTDC Hyderabad	Member
8.	Dr. A. Agnihotri Director, JNARDDC	Member
9.	Prof. Suddhasawa Basu, Director, CSIR-IMMT	Member
10.	Prof Virendra Kumar Tewari Director, IIT, Kharagpur	Member
11.	Dr. H.S. Venkatesh Director, NIRM	Member
12.	Shri Arun Kumar Shukla CMD, HCL, Kolkata	Member
13.	Dr. Ranjit Rath CMD, MECL, Nagpur	Member
14.	Shri Subrata Kar GM (R&D), NALCO, Bhubaneswar	Representative Member
15.	Prof. Shalivahan Dean, R & D, IIT (ISM), Dhanbad	Representative Member
16.	Dr. C. N. Ghosh Chief Scientist & Head, CIMFR, Dhanbad	Representative Member
17.	Shri Ramananda Adhikari DGM, HCL	Representative Member
18.	Dr. S. Kamalakaram DGM (Exploration), MECL, Nagpur	Representative Member

Leave of absence granted to other members.