

Ministry of Mines

Metal-IV Section

Minutes of review meeting of PERC (Project Evaluation & Review Committee) held under the Chairmanship of Shri U C Joshi, Joint Secretary, Ministry of Mines during 25-26 May 2023 through VC mode.

A meeting of the PERC (Project Evaluation & Review Committee) was held under the Chairmanship of Shri U C Joshi, Joint Secretary, Ministry of Mines during 25-26 May 2023 through VC mode to review the ongoing projects. **The list of participants is enclosed in Annexure-A.**

2. A total of 59 ongoing projects were considered for review by the PERC. 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 review.

3. The committee of experts present in the review meeting were divided into three panels with corresponding expertise. **Panel-A** : Metallurgy (Alloys, Rare Earths, Specialty materials and product & Metal Extraction). **Panel-B** : Mining (including rock mechanics, design, equipments, energy, environment, safety) and **Panel-C** : Mineral Processing (including Geo-science and Exploration & Beneficiation, Ore Dressing & Recovery from waste). This enabled more time for the PIs to make the presentations as well as detailed interaction. All the three panels met together at the end of the session on 26th May 2023 and finalized the recommendations. 04 PIs were absent and hence their projects were not reviewed. The details are given in the succeeding paragraphs. All the members and PIs attended the meeting through Video Conferencing mode. **17 completed and 42 ongoing projects were reviewed by the PERC.**

4. REVIEW OF COMPLETED / ONGOING PROJECTS :

Following 59 projects were reviewed by the PERC. The details of the review and recommendations are as under:

4.1 Project No. Met4-14/9/2021

	Ongoing
Project No.	14/9/2021
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	ADITIYA RANA adityarana.nitjaipur@gmail.com_9694641232

Project Cost & Duration	₹ 38,19,000/- [52 nd SSAG] 3 years
Remarks: ONGOING PI was absent. It was recommended that PI shall submit the progress report within 15 days to Ministry of Mines.	

4.2 Project No. Met4-14/1/2021:

	Completed
Project No.	14/1/2021
Project Title	Recovery of copper from water bodies nearby copper mines using microbial electrochemical systems
Institution	Indian Institute of Technology ISM Dhanbad Industry Partner Hindustan Copper Limited
Principal Investigator	VIPIN KUMAR E-mail:- vipinmicro1@iitism.ac.in 9471191352
Project Cost & Duration	₹ 25,00,000/- [52 nd SSAG] 1½ years (extended upto Dec 2022)
PERC REMARKS/SUGGESTION:	
Completed	
<ol style="list-style-type: none"> 1. PI informed that he has mentioned the information regarding copper recovery process & economic concentration in final report. 2. The final findings were reviewed and report was accepted. 3. The committee appreciated the work carried out. 4. A one-page write-up on the outcome of this project with process economics and way forward should be submitted to Ministry of Mines. 5. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 6. PERC recommended for acceptance of the final report by SSAG. 	

4.3 Project No. Met4-14/24/2021:

	Ongoing
Project No.	14/24/2021
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 9582513867
Project Cost & Duration	₹ 24,00,000/- [52 nd SSAG] 2 years
REMARKS/SUGGESTIONS:	
ONGOING PI was absent. It was recommended that PI shall submit the progress report within 15 days to Ministry of Mines.	

4.4 Project No. Met4-14/17/2021:

	Ongoing
Project No.	14/17/2021
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 E-mail:-prosenjit@cmeri.res.in, 9531590074
Project Cost & Duration	₹ 55,00,000/- [52 nd SSAG] 2 years (One year extension)
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress of the project is satisfactory. 2. PI advised to undertake low pressure die casting. 3. PI also advised to carry out property comparison tests with commercially available links along with Life cycle analysis. 4. Recommended to release balance fund /next installment subject to submission of utilization certificate and statement of expenditure 	

4.5 Project No. Met4-14/2/2021:

	Ongoing
Project No.	14/2/2021
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 E-mail: -chandrani@cimfr.nic.in 9422477144
Project Cost & Duration	₹ 37,89,850/- [52 nd SSAG] 3 years
REMARKS: ONGOING	
<ol style="list-style-type: none"> 1. Progress was satisfactory 2. As per the last PERC suggestion, PI has completed field visits in different mines 3. Equipment purchased with compatible software 4. PI requested for six-month extension, but committee suggested completing the project within the time limit. 5. Studies of the design of crown pillars in opencast and underground mines done 6. Recommended to release balance fund /next installment subject to submission of utilization certificate and statement of expenditure. 	

4.6 Project No. Met4-14/18/2021:

	Ongoing
Project No.	14/18/2021
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 Industry Partner Hindustan Zinc Limited, Tata Steel and SAIL
Principal Investigator	SANJAY KUMAR ROY E-mail: -sanjaykroy.cmri@gmail.com 9471192140
Project Cost & Duration	₹ 52,00,000/- [52 nd SSAG] 2 years
Remarks: ONGOING	
<ol style="list-style-type: none"> 1. The project work is satisfactory 	

2. Based on request of PI the project was extended up Mar 2024.
3. The PI has conducted Numerical model studies with various properties of the dump and pit slopes to establish toe distance on a stand alone basis.
4. Integrated model studies for universal implementation is expected from the project.
5. PI to explain the reasons with regard to the results shown : density and dump distance/FOS
6. Recommended to release balance fund /next installment subject to submission of utilization certificate and statement of expenditure.

4.7 Project No. Met4-14/26/2021 :

	Completed
Project No.	14/26/2021
Project Title	Preparation of synthetic zircon from zircon minerals of beach sand, its characterization and value addition as thermal and electrical insulator
Institution	C.V. Raman Global University, Bhubaneswar (NGO - Society Raman Education)
Principal Investigator	SUNITA ROUSTRAY E-mail:- sroutray1@cvrce.edu.in 7327847963
Project Cost & Duration	₹ 10 Lakhs (seed money) [52 nd SSAG] 1 year
PERC REMARKS/SUGGESTION:	
<p>Completed</p> <ol style="list-style-type: none"> 1. The final findings were reviewed 2. PI should include the following in the final report <ol style="list-style-type: none"> a. Measurement of thermal and electrical conductivity and compared to synthetic zircon available in market. b. As recovery of zirconium is 90 %, remaining product should be measured in ICP at institutes like JNARDDC to find the impurities. c. Compile the result of product after analysis 3. A one-page write-up on the outcome of this project, process economics and way forward should be submitted to Ministry of Mines 4. PERC recommended for acceptance of the final report by SSAG after inclusion of above points. 	

4.8 Project No. Met4-14/19/2021:

	Ongoing
Project No.	14/19/2021
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 0798061767
Project Cost & Duration	₹ 54,93,500/- [52 nd SSAG] 2 Yrs
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Based on request of PI, the project is extended upto Dec 2023 2. PI needs to speed up the procurement of REE minerals so that some REE can be targeted using this device ppm/ppb level. 3. Monazite can be taken up for the study. 4. Sample from IREL can also be taken for the experiment. 5. PI was also advised to focus on device fabrication. 6. Considering the slow progress, the project will be reviewed after 3 months. 	

4.9 Project No. Met4-14/8/2021:

	Ongoing
Project No.	14/8/2021
Project Title	Extraction and isolation of Al, K, Li, Rb and Cs from Mica
Institution	CSIR Institute of Minerals and Materials Technology
Principal Investigator	BARSA DAS E-mail:- barsha.dash@gmail.com 9439018460
Project Cost & Duration	₹ 9,97,500/- [52 nd SSAG] 1 Year
REMARKS/SUGGESTION:	
ONGOING	

1. Committee advised that beneficiation has to be done before leaching.
2. Beneficiation of lithium from Mica has to be searched from literatures.
3. Project extended upto Dec 2023 for completing the above activities.
4. 2nd phase of the project is not recommended.

4.10 Project No. Met4-14/7/2021 :

	Completed
Project No.	14/7/2021
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 E-mail:- atripathy@immt.res.in 9437066723
Project Cost & Duration	₹ 15 lakh (seed money) [52 nd SSAG] 1yr
PERC REMARKS/SUGGESTION:	
Completed	
<ol style="list-style-type: none"> 1. PI has informed that they have tried different other methods but could not succeed, hence followed the methods as presented. 2. The final findings were reviewed and report was accepted. 3. A one page write up on the outcome of this project and way forward with possible process economics should be submitted to Ministry of Mines. 4. PERC recommended for acceptance of the final report by SSAG 	

4.11 Project No. Met4-14/4/2021:

	Ongoing
Project No.	14/4/2021
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 9566288703

Project Cost & Duration	₹ 37,99,700/- [52 nd SSAG] 2 years
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Silicon has to be of finer size for the experiment. 2. Molluscite with tungsten dissolved in it has to be taken by the PI and molybdenum has to be reduced with excess silicon. 3. PI to interact with NFTDC for further technical assistance. 4. Based on request of PI, the project is extended upto Dec 2023 5. Recommended to release next installment / balance funds subject to submission of utilization certificates and statement of expenditure 	

4.12 Project No. Met4-14/16/2021:

	Ongoing
Project No.	14/16/2021
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 E-mail:- npradhan@immt.res.in 0943754083
Project Cost & Duration	₹ 12,93,600/- (seed money) [52 nd SSAG] 1 year (extended upto March 2023)
PERC REMARKS/SUGGESTION:	
Ongoing	
<ol style="list-style-type: none"> 1. Progress was satisfactory till date 2. Based on the request of PI, the project is extended up to March 2024 for finding better results 3. PI should take efforts to estimate the cost economics of process for recovery of lithium 	

4.13 Project No. Met4-14/15/2021:

	Ongoing
Project No.	14/15/2021
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 E-mail:- bankim@immt.res.in 7978521730
Project Cost & Duration	₹ 10 lakhs (seed money) [52 nd SSAG] 1 year
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress was satisfactory. 2. PI should undertake comparative analysis with pure manganese available in market 3. PI should contact the MOIL for better understanding of result and submit the final report. 	

4.14 Project No. Met4-14/27/2021:

	Ongoing
Project No.	14/27/2021
Project Title	Development of Alternative flux Material from Red Mud for Steel Dephosphorization
Institution	CSIR Central Electrochemical Research Institute
Principal Investigator	ANAND BABU G E-mail:- anandbabu@cecri.res.in 9486339240
Project Cost & Duration	₹ 10 lakhs (seed money) [52 nd SSAG] 1yr

PERC REMARKS/SUGGESTION:**ONGOING**

1. Progress was satisfactory.
2. Based on the request of PI, the project is extended upto Dec 2023 for submission of final report.
3. PI has been asked to establish process flowsheet, impact of other materials like alumina, alkali etc in mud on processing and quality of product.

4.15 Project No. Met4-14/5/2021:

	Ongoing
Project No.	14/5/2021
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 9445560767
Project Cost & Duration	₹ 52,51,000/- [52 nd SSAG] 2 Yrs

REMARKS/SUGGESTION:**ONGOING**

1. Based on request of PI, the project is extended upto Dec 2023
2. Progress was satisfactory.
3. Work done was appreciated by members
4. Recommended to release next installment / balance funds subject to submission of utilization certificates and statement of expenditure

4.16 Project No. Met4-14/28/2021:

	Completed
Project No.	14/28/2021
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 Institute of Advanced Studies (NGO - PSG and Sons Charities)
Principal Investigator	R.SELVAKUMAR E-mail:- rsk@psgias.ac.in 9944920032
Project Cost & Duration	₹ 9,99,000/- (seed money) [52 nd SSAG] 1 year
PERC REMARKS/SUGGESTION:	
COMPLETED	
<ol style="list-style-type: none"> 1. The final findings were reviewed and found to be of academic nature. 2. PI should include the following in the final report :- <ol style="list-style-type: none"> a. Proper flow chart of the process b. Define clearly the input material for rare earth element, composition, achievement & economics of process in tabular form 3. A one page write up on the outcome of this project and way forward should be submitted to Ministry of Mines. 4. PERC recommended for acceptance of the final report by SSAG after inclusion of above points. 	

4.17 Project No. Met4-14/29/2021:

	Ongoing
Project No.	14/29/2021
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	KARTHIK.V E-mail:- kartik@cimfr.nic.in 9589442278
Project Cost & Duration	₹ 15 lakhs (seed money) [52 nd SSAG] 1 Year
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress is satisfactory. 	

2. Based on request of PI, the project is extended upto Dec 2023 for completing the project.
3. 2nd phase of the project is not recommended.

4.18 Project No. Met4-14/30/2021:

	Ongoing
Project S No.	14/30/2021
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 and CSIR Institute of Minerals and Materials Technology Industry Partner Hindustan Zinc Limited
Principal Investigator	NARSIMA MANGADODDY E-mail:- narasimha@che.iith.ac.in 9505754134
Project Cost & Duration	₹ 10,00,000/- (seed money) [52 nd SSAG] 1 year
PERC REMARKS/SUGGESTION:	
ONGOING	
PI was absent. It was recommended that PI shall submit the progress report within 15 days to Ministry of Mines.	

4.19 Project No. Met4-14/3/2021:

	Ongoing
Project No.	14/3/2021
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 bhavna.tripathi@jaipur.manipal.edu_9460383678
Project Cost & Duration	₹ 30,00,000/- [52 nd SSAG] 2 years
Remarks ONGOING	
<ol style="list-style-type: none"> 1. The project work is appreciated. 2. Based on request of PI the project was extended up Mar 2024. 3. Characterizations studies of sand were done 4. PI should explore using artificial sand for construction activities 5. Recommended to release balance fund /next installment subject to submission of utilization certificate and statement of expenditure. 	

4.20 Project No. Met4-14/20/2021:

	Completed
Project No.	14/20/2021
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 E-mail:-mvas@iict.res.in 9496445333
Project Cost & Duration	₹ 31,00,000/- [52 nd SSAG] 1 year
REMARKS/SUGGESTION:	
COMPLETED	
<ol style="list-style-type: none"> 1. The work is completed. 2. The final findings were reviewed and report was accepted. 3. The committee appreciated the work carried out. 4. A one page write up on the outcome of this project and way forward should be submitted to Ministry of Mines. 5. PI advised to return the unspent amount along with submission of UC and SE. 6. PERC recommended for acceptance of the final report by SSAG. 	

4.21 Project No. Met4-14/31/2021:

	Completed
Project No.	14/31/2021
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 E-mail:- pkbasky@immt.res.in 9470393508
Project Cost & Duration	₹ 10,00,000/- (seed money) [52 nd SSAG] 1yr
PERC REMARKS/SUGGESTION:	
<p>Completed.</p> <ol style="list-style-type: none"> 1. The final findings were reviewed. 2. A one page write up on the outcome of this project and way forward should be submitted to Ministry of Mines. 3. PERC recommended for acceptance of the final report by SSAG. 	

4.22 Project No. Met4-14/32/2021:

	Completed
Project No.	14/32/2021
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	SHIV KUMAR ANGADI E-mail:- shivakumar@immt.res.in 8763866142
Project Cost & Duration	₹ 10,00,000/- (seed money) [52 nd SSAG] 1yr (extended upto March 2023)
PERC REMARKS/SUGGESTION:	

Completed.

1. The final findings were reviewed.
2. A one page write up on the outcome of this project and way forward should be submitted to Ministry of Mines.
3. PERC recommended for acceptance of the final report by SSAG.

4.23 Project No. Met4-14/18/2022:

	Ongoing
Project No.	14/18/2022
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 National Institute of Technology Karnataka Surathkal, Anna University
Principal Investigator	Autar Krishen Raina (9422806689, rainaji@cimfr.nic.in) Karra Ram Chandar (9448627564, krc_karra@yahoo.com) Balamadeswaran P (9003054354, balamadeswaran@gmail.com) (CSIR Central Institute of Mining and Fuel Research National Institute of Technology Karnataka Surathkal, Anna University) Industry Partner – MSPL Ltd.
Project Cost & Duration	₹ 40,00,000/- [53 rd SSAG] 2 years CSIR, CIMFR Dhanbad – 16,61,910 NIT, Surathkal – 14,89,820 Anna University – 8,48,270
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. The project work is satisfactory. 2. Equipment procurement under process 3. The committee suggested completing the project within the timeline. 4. Recommended to release balance fund /next installment subject to submission of utilization certificate and statement of expenditure. 	

4.24 Project No. Met4-14/7/2022:

	Ongoing
Project No.	14/7/2022
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	₹ 39,07,500/- [53 rd SSAG] 2 years
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Scalability has to be done for the project. 2. PI should undertake the kinematics as it is to be automated in the prototype machine for entry level industry operation. 3. Progress was satisfactory. 4. Recommended to release next installment / balance funds subject to submission of utilization certificates and statement of expenditure 	

4.25 Project No. Met4-14/3/2022:

	Ongoing
Project No.	14/3/2022
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	1 Shabi Thankaraj Salammal : M: 8754743511 (CSIR Advanced Materials and Processes Research Institute) 2. Upendra Singh (Jawaharlal Nehru Aluminium Research Development and Design Centre) tsshabi@ampri.res.in singhu@jnarddc.gov.in
Project Cost & Duration	₹ 71,80,384/- [53 rd SSAG] 2 years CSIR AMPRI – 43,97,384/- & JNARDDC, Nagpur – 27,83,000/-
PERC REMARKS/SUGGESTION:	

ONGOING

1. X-ray shielding tiles and Gamma Ray shielding blocks were developed and their attenuation properties were studied.
2. Progress was satisfactory.
3. Recommended to release next installment / balance funds subject to submission of utilization certificates and statement of expenditure

4.26 Project No. Met4-14/199/2022:

	Ongoing
Project No.	14/199/2022
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 E-mail: rjain@iitd.ac.in : M: 8690508166
Project Cost & Duration	₹ 14,98,560/- [53 rd SSAG] 2 years

PERC REMARKS/SUGGESTION:**ONGOING**

1. Progress is satisfactory
2. PI should prepare the flow chart of mass balance and mineral balance of raw material and process.
3. PI should focus on recovery percentage of Ga and Ge and preliminary economics of the process and represent them in tabular form.
4. Recommended to release next installment / balance fund subject to submission of utilization certificates and statement of expenditure

4.27 Project No. Met4-14/9/2022:

	Ongoing
Project No.	14/9/2022
Project Title	Un-diluted Recycling of Cast Aluminium Alloys Containing High Fe Impurity Suitable for SMEs
Institution	BML MUNJAL UNIVERSITY
Principal Investigator	1. Kameswari Prasada Rao Ayyagari (BML Munjal University, Gurgaon) 8295963823

	2. Ramavajjala Anil Kumar (Jawaharlal Nehru Aluminium Research Development and Design Centre) 3. Bhagyanathan Chandragandhi Sri Ramakrishna Engineering College, Coimbatore (Snr Sons Charitable Trust) akprasada@yahoo.com anilkumar@jnarddc.gov.in bhagyanathan.chandragandhi@srec.ac.in
Project Cost & Duration	₹ 88,57,900/- [53 rd SSAG] 2 years BML Munjal Univ Gurgaon- 22,19,700 : JNARDDC, Nagpur – 31,56,250 & REC, Coimbatore- 34,81,950
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. PI has presented all the different combinations of alloying elements 2. Progress was satisfactory. 3. The potential scale up can be taken up directly with the SME in 2nd phase. 4. Recommended to release next installment / balance funds subject to submission of utilization certificates and statement of expenditure 	

4.28 Project No. Met4-14/13/2022

	Ongoing
Project No.	14/13/2022
Project Title	Novel Material Manufacturing method for Large Volume Cast Metal Matrix Nanocomposites (Ultra-Cast)
Institution	Malaviya National Institute of Technology Jaipur & CSIR National Institute for Inter disciplinary Science and Technology
Principal Investigator	Sreekumar Vadakke Madam (9400010768, sreekumar.meta@mnit.ac.in)
Project Cost & Duration	₹ 50,00,000/- [53 rd SSAG] 2 years MNIT, Jaipur – 26,76,000 & CSIR, NIIST, Thiruvananthapuram- 23,24,000
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. PI was suggested to explore the possibility of preparing nanocomposite master alloys and carry out experiments by addition of the same in liquid metal . 2. Progress was satisfactory. 	

3. Scale up / commercialization should be taken up on successful completion with industry / MSME directly
4. Recommended to release next installment / balance funds subject to submission of utilization certificates and statement of expenditure

4.29 Project No. Met4-14/2/2022:

	Ongoing
Project No.	14/2/2022
Project Title	Technology development for holistic utilization of red mud for extraction of metallic values and residue utilization
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre Industry partner : NALCO, HINDALCO & VEDANTA
Principal Investigator	Upendra Singh 9422980366 E-mail: singhu@jnarddc.gov.in
Project Cost & Duration	₹ 30,57,500/- [53 rd SSAG] 3 years
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress is satisfactory 2. PI should focus on possible improvement in scandium enrichment which looks like a challenge. 3. Mineralogy characterization of red mud should be carried out 4. Recommended to release next installment / balance fund subject to submission of utilization certificates and statement of expenditure 	

4.30 Project No. Met4-14/17/2022:

	Ongoing
Project No.	14/17/2022
Project Title	Polymerized Molecular Receptor as Solid Sorbents for Size-Selective Recognition and Separation of Rare Earth Elements.
Institution	CSIR Central Salt and Marine Chemicals Research Institute, Bhavnagar
Principal Investigator	Amal Kumar Mandal (8250835588, akmandal@csmcri.res.in)
Project Cost & Duration	₹ 8,99,000/- (Seed money) [53 rd SSAG] 1 year

PERC REMARKS/SUGGESTION:**ONGOING**

1. PI has gone only upto material synthesis and advised to design a 100 kg column
2. The project was extended upto Dec 2023 for completing the project work.
3. 2nd phase of the project is not recommended.

4.31 Project No. Met4-14/15/2022:

	Ongoing
Project No.	14/15/2022
Project Title	Production of Onyx grade ATH (sodium bicarbonate route) using low-grade bauxite from Kutch region of Gujarat
Institution	Kalinga institute of industrial technology, Bhubaneshwar & JNARDDC, Nagpur Industry Partner : NIKNAM Chemicals Pvt Ltd.
Principal Investigator	Suraj Kumar Tripathy 933747654 E-mail: suraj.tripathy@kiitbiotech.ac.in Dr Suchita Rai Email: suchitarai@jnarddc.gov.in
Project Cost & Duration	₹ 67,42,500/- [53 rd SSAG] 2 years KIIT, Bhubaneshwar – 22,51,200 & JNARDDC, Nagpur – 44,91,300

PERC REMARKS/SUGGESTION:**ONGOING**

1. Progress is satisfactory
2. PI should aim to achieve 90% dawsonite conversion
3. PI should develop the flow sheet for the process and work on optimization of precipitation parameters.
4. Recommended to release next installment / balance fund subject to submission of utilization certificates and statement of expenditure

4.32 Project No. Met4-14/8/2022:

	Ongoing
Project No.	14/8/2022
Project Title	Utilization of chromite over burden (mining waste in Orissa) as an oxygen carrier material for clean energy (hydrogen) production using chemical looping technique
Institution	Indian Institute of Technology Kharagpur Industry Partner: M/S Tata Steel Limited, R&D, Jamshedpur
Principal Investigator	Manas Paliwal E Mail- manas.paliwal@metal.iitkgp.ac.in
Project Cost & Duration	₹ 44,70,000/- [53 rd SSAG] 2 years
PERC REMARKS/SUGGESTIONS:	
ONGOING	
<ol style="list-style-type: none"> 1. Committee observed that PI is using fines of chromite ore / proposed to use mill tailing instead of chromite overburden for producing hydrogen. 2. Thus the basic objective of the project is not met since chromite overburden is not being used. 3. The committee suggested the PI to inform the Ministry of Mines about the change in objective for taking a final decision in the matter. 	

4.33 Project No. Met4-14/16/2022:

	Ongoing
Project No.	14/16/2022
Project Title	Synthesis, and Development of Hybrid Carbon Nanocomposites and Polymer Emulsions as Flocculants for Mining Industry
Institution	CSIR National Institute for Interdisciplinary Science and Technology Industry Partner - NALCO
Principal Investigator	SURESH K I 9652470482 E-mail: kisuresh@niist.res.in
Project Cost & Duration	₹ 14,94,612/- [53 rd SSAG] 1½ years
PERC REMARKS/SUGGESTION:	
ONGOING	

1. Progress is satisfactory
2. PI should prepare flow chart and cost comparison chart with flocculants used by industry.
3. Efficiency of the flocculant for different minerals to be investigated and reported in tabular form, under optimum conditions.
4. Recommended to release next installment / balance fund subject to submission of utilization certificates and statement of expenditure

4.34 Project No. Met4-14/12/2022:

	Ongoing
Project No.	14/12/2022
Project Title	Development of novel hydrometallurgical technological process package for extraction and separation of niobium, tantalum and rare earths from columbite and tin slag
Institution	CSIR National Metallurgical Laboratory, Jamshedpur Industry Partner – MO INFRA
Principal Investigator	Abhilash (9431962767, abhilash@nmlindia.org)
Project Cost & Duration	₹ 40,00,000/- [53 rd SSAG] 2 years
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. PI was advised to expedite the process of sourcing of tin slag atleast half a dozen of source sample for the experiment. 2. Project to be reviewed after 3 months. 	

4.35 Project No. Met4- 14/11/2022:

	Ongoing
Project No.	14/11/2022
Project Title	Design and Development of Real-Time Ground Behaviour Monitoring System (RT-GBMS) for Underground Metal Mines - An Innovative ICT based Solution
Institution	(Trident Academy of Technology, Bhubaneswar (NGO - Dinabandhu Foundation for Educational Research and Socio-economic Development) and National Institute of Technology Rourkela Industry partner: (1) MOIL Limited, (2) Directorate General of Mines & Safety, (3) AsicZen Technologies India Pvt. Ltd

Principal Investigator	Abhaya Kumar Samal E Mail- abhaya@tat.ac.in
Project Cost & Duration	₹ 39,88,000/- [53 rd SSAG] 3 years
PERC REMARKS/SUGGESTIONS:	
ONGOING	
<ol style="list-style-type: none"> 1. PI has done the first and second visits to underground mines for a validation study 2. Real time data is yet to be collected in the field for calibrating and establishing the root for early warning system. 3. A data acquisition system is planned in the last part of the project. 4. PI advised to apprise the committee as to how system can reduce background noise signal for remote transmission of data 5. Recommended to release balance fund /next installment for undertaking the above works subject to submission of utilization certificate and statement of expenditure. 	

4.36 Project No. Met4-14/1/2022:

	Ongoing
Project No.	14/1/2022
Project Title	Solid-state recycling of aluminium chips (waste) for production of billets for pilot scale extrusion
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre Industry partner – TASL, Nagpur
Principal Investigator	Dr ANAS N S (7382105254, anas@jnarddc.gov.in)
Project Cost & Duration	₹ 49,88,900/- [53 rd SSAG] 2 years
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. PI advised to ensure improvement of joint in the billet. 2. Chopping of chips to be done i.e. up to a finer size and 50 to 60% porosity has to be achieved. 3. End product has to be identified. It has to be seen whether extrusion is possible with the end product. PI advised to visit NFTDC. 4. Cost escalation of 10 lakhs was not accepted by PERC 	

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|---|
| 5. Progress was satisfactory. |
| 6. Recommended to release next installment / balance funds subject to submission of utilization certificates and statement of expenditure |

4.37 Project No. Met4-14/4/2022:

	Ongoing
Project No.	14/4/2022
Project Title	End to End Technology Development and Scale-up (TRL-7) for Cobalt Recovery, Cobalt alloy and components for Bio-Medical Applications
Institution	Non Ferrous Materials Technology Development Centre, NFTDC Industry partner – CuraSigna
Principal Investigator	Thyagarajan (9833110641, thyagarajanr@nftdc.res.in)
Project Cost & Duration	₹ 91,29,500/- [53 rd SSAG] 2 years
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress was satisfactory. 2. Recommended to release next installment / balance funds subject to submission of utilization certificates and statement of expenditure 	

4.38 Project No. Met4-14/10/2022:

	Ongoing
Project No.	14/10/2022
Project Title	Carbonaceous Nanomaterials from Graphite Sources of Arunachal Pradesh for Electrochemical Energy Storage and Sensor Applications
Institution	CSIR North East Institute of Science and Technology
Principal Investigator	Manash R Das E Mail- mrdas@neist.res.in
Project Cost & Duration	₹ 20,00,000/- (Seed money) [53 rd SSAG] 1 year
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Based on request of PI the project was extended up Aug 2023. 2. PI has identified and collected samples from the Bopi & Tai area of Arunachal Pradesh 	

3. PI has carried out detailed characterization and beneficiation studies of graphite
4. The toxicity of graphene need to be addressed
5. PI should measure this level and evaluate the effects of graphene toxicity

4.39 Project No. Met4-14/14/2022:

	Ongoing
Project No.	14/14/2022
Project Title	Recovery of metallic values from the discarded copper slag
Institution	CSIR Institute of Minerals and Materials Technology Industry partner – Hindustan Copper
Principal Investigator	Tonmoy Kundu 8420314271 E-mail: tkundu@immt.res.in
Project Cost & Duration	₹ 20,00,000/- [53 rd SSAG] 2 years
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Progress is satisfactory. 2. PI should focus on copper slag and ascertain the composition. 3. Work out the process economics and compare with existing process. 4. Recommended to release next installment / balance fund subject to submission of utilization certificates and statement of expenditure 	

4.40 Project No. Met4-14/2/2023:

	Ongoing
Project No.	14/2/2023
Project Title	Characterization of Orogenic Style Gold Mineralization in the BIFs of Dharwar-Shimoga Basin, Exploration Guides for Prospect-Scale targeting of subsurface Gold
Institution	Global Academy of Technology, Bengaluru (NGO - National Education Foundation)
Principal Investigator	Shalini G 8749078777 E-mail: shalinigat@gmail.com
Project Cost & Duration	₹ 25,00,000/- (Seed money) [53 rd SSAG] 1 year

PERC REMARKS/SUGGESTION:**ONGOING**

1. Progress is quite slow, needs to expedite
2. PI should get some satisfactory result and submit process flow chart of the process and mass balance.
3. Recommended for review after 3 months.

4.41 Project No. Met4-14/6/2022:

	Ongoing
Project No.	14/6/2022
Project Title	Development of medium strength Al-Mg-Si (AA6082 based) alloy for high end strategic applications (extruded or drawn tubes)
Institution	Indian Institute of Technology Gandhinagar & JNARDDC, Nagpur
Principal Investigator	Amit Arora (8469255829, amitarora@iitgn.ac.in) Kola Immanuel Raju (9980574024, immanuelkola@jnarddc.gov.in)
Project Cost & Duration	₹ 97,51,680/- [53 rd SSAG] 2 years IIT Gandhinagar – 43,37,680 & JNARDDC, Nagpur – 54,14,000

PERC REMARKS/SUGGESTION:**ONGOING**

1. PI from IIT Gandhinagar has completed the simulation part and finalized the optimized composition.
2. PI from JNARDDC presented the benchmarking.
3. Progress was satisfactory.
4. Recommended to release next installment / balance funds subject to submission of utilization certificates and statement of expenditure

4.42 Project No. Met4-14/10/2021:

	Ongoing
Project No.	14/10/2021
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 & Chhattisgarh Council of Science & Technology, Government of Chhattisgarh, Raipur
Principal Investigator	Pravin G Bhukte 9960020724, 9527916756 pgbhukte@jnarddc.gov.in
Project Cost & Duration	₹ 45,00,000/- [53 rd SSAG] 2 years
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. The project work is appreciated. 2. Equipment (log plot & Moisture analyzer) installed. 3. The representative bauxite & laterite samples collected from various deposits in the Chhattisgarh state and geo-technological studies have been done. 4. PI should incorporate data on the possible application of bauxite. 5. Recommended to release balance fund /next installment subject to submission of utilization certificate and statement of expenditure. 	

4.43 Project No. Met4-14/203/2022:

	Ongoing
Project No.	14/203/2022
Project Title	Development of low cost filler material utilizing Lithomargic clay for paint industry as per IS :68 (2006) standard Beneficiation, Ore Dressing, Mineral Processing & Recovery from waste
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre Industry partner - Mundle Paint and Chemicals
Principal Investigator	Pravin G Bhukte 9960020724, 9527916756 pgbhukte@jnarddc.gov.in
Project Cost & Duration	₹ 45,00,000/- [53 rd SSAG] 2 years
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. It's a relatively new project which has commenced in Feb 2023 2. The progress during the first few months is found to be satisfactory 3. PI advised to undertake chemical and mineral analysis & characterization study of rare earth elements if any in addition to other analysis 4. PI should also focus on possible Leaching method 	

4.44 Project No. Met4-14/19/2022:

	Ongoing
Project No.	14/19/2022
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, Bhunanwshwar & JNARDDC, Nagpur Industry partner - Maiestas Technologies
Principal Investigator	AMRITA MISHRA E-mail: amrita.mishra@kiitbiotech.ac.in Mb. No. 8763354811 Dr Suchita Rai suchitarai@jnarddc.gov.in
Project Cost & Duration	₹ 30,00,000/- [53 rd SSAG] 2 years KIIT, Bhubaneshwar – 15,00,000 & JNARDDC, Nagpur – 15,00,000
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. Ag NPs encapsulated Collagen has been developed by the PI 2. Progress was satisfactory. 3. Recommended to release next installment / balance funds subject to submission of utilization certificates and statement of expenditure 	

4.45 Project No. Met4-14/1/2023:

	Ongoing
Project No.	14/1/2023
Project Title	Development of prototype aluminium seat frame for passenger buses.
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre & and Automotive Research Association of India, ARAI, Pune
Principal Investigator	V N S U VISWANATH AMMU E-mail: viswanatha@jnarddc.gov.in Mb. No. 7798546794 MAHESH ANAND PATWARDHAN

	patwardhan.eds@araiindia.com 9890622494
Project Cost & Duration	₹ 1,00,00,000/- [53 rd SSAG] 2 years JNARDDC, Nagpur – 60,00,000 ARAI, Pune – 40,00,000
PERC REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. It's a relatively new project which commenced in Feb 2023 2. Benchmarking of the existing bus seat frames has been carried by PI. 3. The progress is satisfactory. 	

4.46 Project No. Met4-14/3/2017:

	Completed
Project No.	F No. 14/3/2017
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	akverma@mining.iitkgp.ac.in : 09547859609
Project Cost & Duration	₹ 68,46,000/- [48 th SSAG] 3 years (extended upto March 2023)
Remarks	
COMPLETED	
<ol style="list-style-type: none"> 1. The final findings were reviewed and accepted. 2. The committee appreciated the work carried out. 3. A one page write up on the outcome of this project and way forward for commercialization should be submitted to Ministry of Mines. 4. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 5. PERC recommended for acceptance of the final report by SSAG. 	

4.47 Project No. Met4-14/8/2018:

	Completed
Project No.	14/8/2018
Project Title	Use of Overburden Clay as alternate for aggregate
Institution	Indian Institute of Technology Madras Chennai-600 036, India & Neyveli Lignite Corporation Ltd. (NLC Ltd)
Principal Investigator	Dr. K. Ramamurthy, E-mail:-vivek@iitm.ac.in: 09445391265
Project Cost & Duration	₹ 70,00,000/- [49 th SSAG] 3 years (extended upto Dec 2022)
PERC REMARKS/SUGGESTION:	
COMPLETED	
<ol style="list-style-type: none"> 1. The final findings were reviewed and found to have commercial potential. 2. The committee appreciated the work carried out. 3. A one page write up on the outcome of this project and way forward should be submitted to Ministry of Mines along with plan for Pilot plant set up (as informed by PI). 4. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 5. PERC recommended for acceptance of the final report by SSAG. 	

4.48 Project No. Met4-14/18/2018:

	Ongoing
Project No.	14/18/2018
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 (NIIST) Industrial Estate P.O, Thiruvananthapuram - 695 019
Principal Investigator	Dr. Lakshmi Rakesh Kumar Yasarla E-mail:yasarla.rakesh@gmail.com : 09032450550

Project Cost & Duration	₹ 42,61,000/- [49 th SSAG] 2 years (extended upto Dec 2022)
PERC REMARKS/SUGGESTION:	
Ongoing	
<ol style="list-style-type: none"> 1. Based on the request of PI, the project is extended upto Dec 2023 2. PI advised to compare with flocculant samples used by industry for comparative analysis of performance and cost analysis. 3. Progress is found to be satisfactory 4. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure 	

4.49 Project No. Met4-14/24/2018:

	Completed
Project No.	14/24/2018
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 E-mail:mantukni@gmail.com : 0992129423
Project Cost & Duration	₹ 63,02,600/- [50 th SSAG] 1½ years (extended upto Dec 2022)
Objectives of the project	Based on in-house laboratory scale (10 g CFA) studies, it is confirmed that extraction of pure silica and aluminium fluoride from coal fly ash is technically possible. Major objective of the project is to study process on bench scale (0.5-1 kg CFA) and to understand various parameters of process, such as Pressure, Temperature
PERC 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 and recommended for scale up of the project with focus on purity 3. A one page write up on the outcome of this project and way forward should be submitted to Ministry of Mines. 4. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 5. PERC recommended for acceptance of the final report by SSAG 	

4.50 Project No. Met4-14/27/2018:

	Ongoing
Project No.	14/27/2018
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 Indian Institute of Science, Bangalore
Principal Investigator	Dr P.V. Sunder Raju; Principal Scientist Email: perumala.raju@gmail.com; : 09490748152 Dr Sajeev Krishnan Associate Professor Centre for Earth Sciences (CEaS), Indian Institute of Science, Bangalore 560 012, India E-mail: sajeev@iisc.ac. inkrishnansajeew@gmail.com09448427463/8281309847
Project Cost & Duration	₹ 30,00,000/- [50 th SSAG] 2 years (extended upto Oct 2022) NGRI- Rs.30 lakhs IISc-Rs. 30 lakhs
PERC REMARKS/SUGGESTION:	
PI was absent. It was recommended that PI shall submit the progress report within 15 days to Ministry of Mines.	

4.51 Project No. Met4-14/30/2018:

	Ongoing
Project No.	14/30/2018
Project Title	Treatment of Acid Mine Drainage for Heavy Metal Removal,
Institution	Indian Institute of Technology Mandi, Kamand Campus, VPOKamand,
Principal Investigator	Dr. Sumit Sinha Ray \ E-mail:-sumitsinha@iitmandi.ac.in : 09748159620
Project Cost & Duration	₹ 19,83,970/- [50 th SSAG] 1 year (extended upto June 2022)
PERC REMARKS/SUGGESTION:	
1. As per remarks of last PERC both the PI and Co-PI have left the institute and no person was authorized to present the status of the project.	

2. Ministry was already requested to take up the matter with Director, IIT Mandi to get the final report.
3. In case they are not able to submit the final report the PIs should return the unutilized project funds back to Ministry along with UC and SE.

4.52 Project No. Met4-14/31/2018

	Completed
Project No.	14/31/2018
Project Title	Recovery of scandium metal from acid leach liquor from titanium mineral industries.
Institution	CSIR-National Institute for Interdisciplinary Science and Technology (NIIST) Industrial Estate P.O, Thiruvananthapuram -695
Principal Investigator	Dr. M. Sundararajan E-mail:rajanmsundar77@yahoo.com : 08129075511
Project Cost & Duration	₹ 32,92,000/- [50 th SSAG] 2 years (extended upto March 2023)
PERC REMARKS/SUGGESTION:	
COMPLETED	
<ol style="list-style-type: none"> 1. The final findings were reviewed. 2. The committee appreciated the work carried out. 3. A one page write up on the outcome of this project, techno-economics and way forward should be submitted to Ministry of Mines. 4. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 5. PERC recommended for acceptance of the final report by SSAG 	

4.53 Project No. Met4-14/6/2019:

	Completed
Project No.	14/6/2019
Project Title	Processing of spent and natural graphite for energy and aerospace application.
Institution	CSIR-Institute of Minerals & Materials Technology (Formerly Regional Research Laboratory), Bhubaneswar PIN: 751013

Principal Investigator	Mamata Mohapatra (Sr. Scientist) CSIR-IMMT, Mail- mamata@immt.res.in: 09437260688
Project Cost & Duration	₹ 23,10,000/- [51 st SSAG] 2 Years (extended upto April 2023)
PERC 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 and way forward should be submitted to Ministry of Mines. 4. The findings have a scope in small and large scale industry. 5. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 6. PERC recommended for acceptance of the final report by SSAG 	

4.54 Project No. Met4-14/7/2019:

	Completed
Project No.	14/7/2019
Project Title	Production and certification of certified reference materials (CRMs) for the analysis of aluminium alloy.
Institution	Jawaharlal Nehru Aluminium Research Development and Design Centre
Principal Investigator	R. N. Chouhan, Principal Scientist Emailid: rnchouhan@jnarddc.gov.in: 09422124941
Project Cost & Duration	₹ 76,40,000/- [51 st SSAG] 2 years (extended upto Dec 2022)
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. Know-how for production and certification of CRMs was established. 4. NABL awarded ISO 17034 accreditation in March 2023. 5. A one page write up on the outcome of this project and way forward should be submitted to Ministry of Mines. 6. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 7. PERC recommended for acceptance of the final report by SSAG. 	

4.55 Project No. Met4-14/12/2019:

	Completed
Project No.	14/12/2019
Project Title	Development of Novel Nano porous hollow Fiber membrane based unit for the effective treatment of Mine wastewater
Institution	National Institute of Technology Karnataka, Surathkal
Principal Investigator	Prof. Arun M.Isloor Membrane Technology Laboratory, Prof & Head of Department, Department of Chemistry, NationalInstituteofTechnology Karnataka, Surathkal, Mangalore E-mail:isloor@yahoo.com: 09448523990
Project Cost & Duration	₹ 5,00,000/- (seed money) [51 st SSAG] ½ year (extended upto March 2022)
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. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 4. PERC recommended for acceptance of the final report by SSAG. 5. A one page write up on the outcome of this project and way forward should be submitted to Ministry of Mines. It should include how the work can be utilized to treat different waste waters eg. Electroplating industry, pickling industry etc by interacting with NFTDC. 	

4.56 Project No. Met4-14/13/2019:

	Ongoing
Project No.	14/13/2019
Project Title	Direct production of Fe-Cr- Ni-Mn stainless alloy from mine waste by thermal plasma process
Institution	CSIR-Institute of Minerals & Materials Technology Bhubaneswar
Principal Investigator	Dr. A.K. Chaubey Principal Scientist E-mail: akchaubey@immt.res.in 094380890232 anil.immt@gmail.com

Project Cost & Duration	₹ 38,31,000/- [51 st SSAG] 2 years (extended upto Dec 2022)
REMARKS/SUGGESTION:	
ONGOING	
<ol style="list-style-type: none"> 1. The committee noted that the last PERC had advised the PI to complete the work by Dec 2022 2. But PI informed that in the absence of budget he has utilized the institute's fund for pursuing the project work which has resulted in delay. 3. The Progress is already behind schedule. 4. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure 5. PI was advised to complete the work on priority basis and submit the final report before July 2023. 6. Review after 3 months. 	

4.57 Project No. Met4-14/11/2019:

	Completed
Project S No.	14/11/2019
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, Varanasi
Principal Investigator	Dr.Amiya Kumar Samal; Department of Geology, Institute of Science E-mail: amiyasamal007@gmail.com: 9580270209
Project Cost & Duration	₹ 14,99,000/- (1 st Phase) [51 st SSAG] 9 months (extended upto March 2023)
PERC REMARKS/SUGGESTION:	
COMPLETED	
<ol style="list-style-type: none"> 1. The final findings were reviewed and report was accepted. 2. A one page write up on the outcome of this project and way forward should be submitted to Ministry of Mines. 3. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 4. PERC recommended for acceptance of the final report by SSAG 	

4.58 Project No. Met4-14/28/2018:

	Completed
Project No.	14/28/2018
Project Title	Development of graphene based membranes from graphite ore for desalination.
Institution	CSIR -National Institute for Interdisciplinary Science and Technology & NML, Jamshedpur
Principal Investigator	Dr SreejaKumari S.S. E-mail:-sreejakumari@niist.res.in: 09442217259
Project Cost & Duration	₹ 60,00,000/- [50 th SSAG] 2 years (extended upto Aug 2022) CSIR, NIIST, Thiruvananthapuram - 42.27 Lakhs CSIR, NML, Jamshedpur – 17.73 Lakhs
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 and way forward should be submitted to Ministry of Mines. 4. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure. 5. PERC recommended for acceptance of the final report by SSAG. 6. 2nd phase of the project is not recommended with Ministry. 7. Instead, the PI should contact NFTDC for scaling up the process with the existing facility of NFTDC. 	

4.59 Project No. Met4-14/15/2013:

	Completed
Project No.	14/15/2013
Project Title	Value addition in mine waste tailing materials through geopolymer formation
Institution	Christ University Kumbalgotu, Bangalore
Principal Investigator	Shri Raghunandan Kumar R. (9880855272 raghunandan.kumar@christuniversity.in, kumar.raghunandan@g mail.com)
Project Cost & Duration	₹ 12,00,000/-

REMARKS/SUGGESTION:

COMPLETED

1. The Final report of the project has been reviewed by a previous PERC.
2. The PI was asked to re-submit the same with certain inclusions.
3. PI has complied with the suggestions and included the test report from NIT Surathkal in the final report.
4. The final report was reviewed and accepted.
5. A one page write up on the outcome of this project and way forward should be submitted to Ministry of Mines.
6. Recommended to release balance funds subject to submission of utilization certificates and statement of expenditure.
7. PERC recommended for acceptance of the final report by SSAG.

5. The PERC meeting concluded with a word of thanks to the chair, members and the experts.

**LIST OF PARTICIPANTS OF REVIEW MEETING OF PERC HELD THROUGH
VC MODE DURING 25-26 May 2023.**

Sr no	Name	Portfolio
1.	Shri U C Joshi Joint Secretary (Mines), Delhi	Chairman
2.	Dr. Pradeep Singh Director Technical (Mines), Delhi	Member Secretary
3.	Shri A. R. Sengupta Dy Secretary, IFD (Mines), Delhi	Member
4.	Shri R P Gupta Director (Mines), Delhi	Member
5.	Prof. T.C. Rao Ex. Director, RRL Bhopal	Member
6.	Shri B.K. Satpathy Ex E.D, NALCO, Bhubaneswar	Member
7.	Dr. K. Balasubramanian Director, NFTDC Hyderabad	Member
8.	Dr. A. Agnihotri Director, JNARDDC	Member
9.	Dr. H.S. Venkatesh Director, NIRM, Bangalore	Member
10.	Mrs Binuta Patra GM (Chem), NALCO, Bhubaneswar	Representative Member
11.	Dr. D.S. Rao, Chief Scientist, CSIR-IMMT	Representative Member
12.	Prof. R K Gangwar Associate Dean (R& D), IIT (ISM), Dhanbad	Representative Member
13.	Prof. Biswajit Samanta, HoD (Mining) IIT, Kharagpur	Representative Member
14.	Dr S K Mandal, Chief Scientist, CIMFR, Dhanbad	Representative Member
15.	Shri Sanjay Panjiyar Director (Operations) HCL, Kolkata	Representative Member
16.	Mr. Kuppu Swamy, Sr Manager- Geology, MECL, Nagpur	Representative Member
17.	Prof Karabi Das HoD (MME) IIT, Kharagpur	Representative Member
18.	Shri Sarang Dhattrak Scientist-D, NIOH, Ahmedabad	Representative Member

Leave of absence granted to other members.