Dr. Dhaval Patel, IAS
Commissioner of Geology & Mining
Industries & Mines Department
Government of Gujarat

Government of Gujarat

Ref No.: CGM/PMC Lab/NMET/2023-24/ 334 Date: 19/06/2023

To,

The Director,

National Mineral Exploration Trust (NMET),

Ministry of mines, F-114

1st Floor, Shastri bhavan,

New Delhi-110001.

Sub: Financial Assistance for procurement of machinery/ Laboratory Equipment/ Instruments, etc, aimed at enhancing the exploration activity.

Ref: Gov. of India, Ministry of mines, dated: 23/03/2022 & 08/06/2022.

Sir,

With reference to above cited subject and reference, I would like to inform you that, for successful accomplishment of mineral exploration work, enhancement of capacity of Petrography and mineral chemistry laboratory, Geology and mining department, Gujarat is essential. In this context, please find enclosed herewith the proposal of this department for financial assistance for procurement of machinery/Laboratory Equipment/Instruments, etc, aimed at enhancing the capacity of PMC Lab in annexure-A for your kind information and necessary action at your end.

In this regard, it is requested that 100% financial assistance may be provided to procure the proposed machinery/Laboratory equipment/Instruments.

Thank you.

Your Faithfully,

15/6/23

(Dr. Dhaval Patel, IAS)

Commissioner Geology and Mining
Gandhinagar, Gujarat

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Annexure-A

Financial assistance for procurement of machinery/Laboratory equipment/Instruments, etc. aimed at enhancing the exploration activity.

Sr.No.	Name of Equipment	Rate (Approx.) In Lac	Unit	Amount (In Lac)	Specification	Availability within the department
1	Press pellet machine	30	1	30	1. Hydraulic pellet press with maximum pressure of 400KN to compact homogeneous powder into a form of pellet sample for elemental analysis. 2. Ring diameter 51.5/35x14 mm.	1
2	Millipore water purification system	28	02	56	1. The Complete Ultrapure Water system must give ASTM Type II pure and Type I ultrapure water from a single system with Tap water as the feed source. 2. The system should handle Conductivity < 1500 µS/cm, TOC < 2000 ppb, Free chlorine < 4 ppm, Fouling Index (SDI) < 10. 3. The unit should be ideal for a daily consumption of up to 10 litres of ultrapure water with 8l/hr pure water production rate. 4. Pre-treatment Cartridge should be a combination of spherical, catalytic-effective, activated carbon, a catalyst and a downstream reverse osmosis membrane. 5. The system should come with closed bag system of 5-8L inbuilt to store consistently high quality pure water for prolonged period and prevent Contamination by ambient air. Should have technology to avoid time consuming cleaning process as well as use of chemicals. 6. System should have a horizontally mounted integrated UV lamp with dual wavelength 185 and 254 nm for optimized temperature gradient and reliable results. 7. Deionization cartridge should consist of catalytic activated carbon with ultrapure mixed bed ion exchange resin to deliver long lasting performance and low-maintenance operation. The flow inside the cartridge should be top-down to produce ideal purification kinetics and prevent any mixing of cleaning media.	02

					8. Final Filter should be 0.45+ 0.2µm pleated double layered sterile grade PESU membrane and should be validated according to HIMA & ASTM F-838-83 guidelines. 9. The Life time of various membranes and consumables should be stated; Pre-treatment cartridge, RO membrane, Deionization cartridge, UV lamp and PESU membrane. 10.System should have touch screen display with intuitive menu navigation facility for easy operation. 11.. Re-circulation feature in standby mode to maintain the purity of the water. 12.The system may have the volume-controlled dispensing function from 50 ml to 5 l (in 50-mlincrements) 13.. System should be Designed, Developed and Produced under DIN/ISO 9001 certificate Quality Management system.	
3	Digital Viscometer	08	01	08	1. Measurement parameters: Viscosity, Temperature, Torque% 2. Viscosity Range(s): (1) Ultra low measurement in the range 1-2000 mPa.Sec (2) 50 to 2,000,000mPa sec or 50 to 2000,000cP. 3. Torque range: 0.0 to 100.0%. 4. Speed: 10 to 600 rpm with minimum Number of Speeds: 06. 5. Resolution: (1) Viscosity : For 10,000mPa.Sec : 1mPa.Sec (2) Torque: 0.1% Temperature : 0.1°C 6. Accuracy: (1) Viscosity: ±1% of full scale (2) Temperature: ± 0.2°C 7. Power Supply: Rechargeable batteries with AC adapter - 230V, 50 Hz. 8. Computer communication Output: USB – PC 9. Standard for Calibration Liquid 2 X 500 ml – along with NIST TRACEABLE Certificate.	01
4	Digital Flame Photometer	02	01	02	1. Range Na: 0 – 100 ppm, K: 0 – 100 ppm, Ca: 15 – 100 ppm (Optional), Li: 10 – 100 ppm (Optional) 2. Sensitivity Na: 5 ppm, K: 5 ppm, Ca: 10 ppm (Optional), Li: 10 ppm(Optional) 3. Accuracy: ± 2% up to 40 ppm, ± 5% above 40 ppm. 4. Readout: 2½ Digit, 7-Segment LED	01

					5. Ignition System: In-built electronic Ignition by press of switch. 6. Repeatability: + 2 Counts 7. Detector: Silicon Photodiode 8. Filters: Narrow band interference glass filters. 9. Nebulizer: Black backelite, axial flow type. 10. Flame System: LPG & dry oil free air. 11. Power: 230 V + 10% AC, 50 Hz	
5	Ph-meter (Table top)	01	01	01	1. Range: 0-14 2. mV: -1000.0 to 1000.0 3. decimal: three 4. Display: It should have Thin Film Transistor (TFT) display of more than 4 inch colour (Blue/Red/Green/Yellow) display for better vision of readings with clear and well-arranged icons of parameters like pH, Temperature, mV, date & Time etc. 5. Power requirements: It should be operable with 9 -12V/10W DC adapter. 6. Temperature Compensation: It should have both Automatic and Manual temperature compensation • It should have Membrane keypad, preferably Polyethylene tetraphthalate (PET)) • To improve the reproducibility, it should allow to choose from at least three endpoint criteria according to our requirements. • The Electrode holder should move in a perfectly vertical way, making it easy to place the sensor in the perfect position i.e. vertically in the measurement beaker. • It should be able to connect peripherals via USB and RS232, increasing its possibilities significantly. Export of measurement data and calibration data should be possible to USB stick or to direct PC software whenever required by us.	01

					• It should allow monitoring of limits of parameter pH by giving a warning message when the value falls below or exceeds the predefined limits. • It should have facility not to delete of data and changing of settings in routine mode. Hence it required to be PIN protected for Login, deletion of data, system settings etc. • It should have choice of endpoint formats like Automatic, manual and timed. • It should have choice of pH decimal places like X.Y, X.YY & X.YYY (Up to one, Two and Three decimal places.) • It should have Data storage up to 500 measurements (Min.) • It should be able to show the quality of last calibration on its screen.	
6	Digital bomb calorimeter	15	01	15	1. Working principle: Iso-thermal 2. Experiment Duration: 10-15 min 3. Oxygen Filling: Automatic/manual 4. Temperature Indicator: Microprocessor based Digital Temperature Indicator with Built-in Timer with Computer Interface & Software. 5. Bomb Firing: Automatic 6. Automatic Calculations: Yes	00
7	UV-Visible Spectrophotometer	15	01	15	1. Optical System: Double beam sealed, quartz coated, lens free system. 2. Grating: Concave holographic grating with 1030 lines/mm or better. 3. Sources: Pre-aligned deuterium and tungsten-halogen lamps with automatic switch over 4. Measurement wavelength Range: 200 – 1100 nm or better. (standalone instrument without using any accessories) 5. Stray Radiation/Light: Min 0.01 %T 6. Wavelength Accuracy: Minimum +/- 0.1 nm 7. Wavelength Reproducibility: Minimum +/- 0.06 nm	00

					8. Band width: Minimum 4 steps (0.6 to 4nm or better) 9. Photometric Accuracy at 1A: Min +/- 0.001 A 10. Photometric Reproducibility (at 1A): Min 0.001 A 11. Photometric Stability (at 1A) at 500nm: Min 0.00015 A/h 12. Baseline Flatness (1nm slit): Min ± 0.001 A 13. Photometric Noise Level at 500nm/0A (1nm Slit) Min 0.00005 A RMS 14. Standard Software: Scan, Time Drive, Wavelength Programming, Concentration, Validation, Report Builder, Arithmetic etc. should be included as standard feature of the s/w 15. Standard Accessories: Quartz cuvette with 10mm path length 4 numbers is to quote. 16. Local Accessories: PC with 2KV UPS is to be offered with the system.	
8	Analytical Weighing Balance	01	5	5	1. Max. capacity: 220 gm 2. Min. weight: 50 mg 3. Readability: 0.1 mg 4. Repeatability: 0.08 mg 5. Display: Backlight LED 6. Weighing pan diameter: 90 mm 7. Dimension: about 344x210x344 mm 8. Adjustment: Internal	10
9	Platinum Crucible	01	30	30	1. Capacity: 25 ml 2. Depth: 38.5 mm 3. Inner diameter: 35 mm 4. Weight: about 27 gm (with rim reinforced)	34
10	Frantz magnetic Separator (LB-1)	30	01	30	1. High quality regulated power supply, sample collects buckets along with following components: • Low field control for separation of ferromagnetic minerals. • Suitable transformers and connectors for operation in 230-volt 50Hz • Suitable electrical connection with 2KVA. • Online UPS for uninterrupted operation.	00

					• Vibrator control for chute and feed – 1 number.	
11	Shaking table concentrator (Wilfley 13A)	10	01	10	1. Water Supply: Wash water requirement of 5 to 20 L/min feed dilution to ~25-30% w/w solid 2. Solid throughput rate: up to 450 kgs/hour (Particle size dependent) (1000 lbs/hr) 3. Electric supply: 3 phase, 380/415V 60/50 HZ, 1.5kW	00
12	Trinocular Microscope	05	01	05	1. Stereo zoom trinocular microscope. 2. Objective lens: 1X and 2X achromatic 3. Nominal working distance: >10cm 4. Eyepiece: 10X compensating with objective lens; micrometre scale in eye piece. 5. Numerical aperture of 1X objective: ≥0.1 6. Minimum zoom ratio: 7:1 7. Magnification range: From £ 10X to 100X 8. C-mount: Built in C-mount for camera parfocalled (in focus) with the eyepiece simultaneously. 9. Light source: Transmitted LED with reflecting mirror and stage glass; Reflected LED with goose-neck double arm fibre illuminator; day light filter to be provided. 10. Camera: CMOS based with provision for high quality photo (Min 5 megapixel) and video capture with quantum Efficiency over 60%; auto and manual exposure control; direct connectivity to computer via laptop. 11. Image analysis software: image capture, display, measurement of length, area, angle, annotation facility. 12. Microscope, camera and imaging software should be from same manufacturer for compatibility and service support.	00
12	Heavy liquid separation facility	05	01	05	Heavy liquid separation for REE mineral separation.	00
13	Pulverizing system	10	01	10	This system requires two equipment in line up as following: 1. Vibratory cup mill: • Feed size: 10mm; batch feed • Cup capacity: 250 ml (Note: Fritz pulver)	00

					• Output size: 10-20 µm • Adjustable RPM: 700-1500 • Electrical: 240V; 50Hz, ~1.5KW • Accessories: Grinding sets: 250ml, Tungsten carbide 100ml; Chromium free steel 2. Disk mill: • Grinding mechanism: Shearing • Feed size: 20mm • Output: Adjustable 50µm and coarser • Operation: Motor-driven grinding gap adjustment with digital gap display • Throughput: >20kg/hr • Speed:>400 rpm • Electrical: 240V; 50Hz,~2KW	
14	Jaw crusher	5	02	10	1. Jaw size: 100 x 150 mm 2. Feed size: 100 x100 mm 3. Output size: 0 – 5 mm (Should be adjustable) 4. Capacity: About 50-100 kg 5. Operation: 440V, 3 phase, 50Hz, AC Supply.	00
Total			**50 Items**	**INR 232.0 lakhs**		

- **Justification for procurement:** The department of Geology and mining, Gujarat is actively engaged in mineral investigation of different minerals such as Limestone, Bauxite, Ordinary sand, etc., in various district of Gujarat. Department of Geology and mining, Gujarat in collaboration with Geological survey of India, Gandhinagar has collected the soil sample under the Gujarat Geo-chemical mapping project (GGCMP). The GGCM project aims to comprehensively map the geological and chemical composition of soil in Gujarat. In order to achieve the desirable results, please sanction the aforesaid machinery/Laboratory equipment/Instruments worth price about rupees 232.0 lakh. It will strengthen the Petrography and mineral chemistry laboratory working under CGM Gujarat.

15/6/23

(Dr. Dhaval Patel, IAS)

Commissioner of Geology and Mining

Gandhinagar, Gujarat State