Email **Director NMET**

Allocation of funds Rs.22,67,37,628/-(Twenty-two crores sixty-seven lakhs thirty-seven thousand six hundred twenty-eight only) for carrying out analysis of pending GGCMP survey sample.

From : commissioner-cgm@gujarat.gov.in Tue, Jun 27, 2023 01:28 PM

Subject : Allocation of funds Rs.22,67,37,628/-(Twenty-two crores sixty-seven lakhs thirty-seven thousand six hundred twenty-eight only) for carrying out analysis of pending GGCMP survey sample.

3 attachments

To : Director NMET <nmet-mines@gov.in>, ds-mines-imd@gujarat.gov.in

Cc : ad-tech-cgm@gujarat.gov.in

PFA,

Regards,

Dr. Dhaval Patel, IAS
Commissioner of Geology & Mining
Gujarat State-Gandhinagar

Proposal funding allocation_GGCMP samples_Final_200623.pdf
722 KB

Adobe Scan 27 Jun 2023 (1).pdf
2 MB

OFFICE OF THE COMMISSIONER OF GEOLOGY & MINING
INDUSTRIES & MINES DEPARTMENT
GUJARAT STATE

Block 15, Dr. Jivraj Mehta Bhavan,
Sector-10 B, Gandhinagar - 382010, Gujarat.
www.cgm.gujarat.gov.in

No: CGM/Tech/NMET/738/853/23-24/ 761 to 762 Date- 26 JUN 2023

To,
Director,
National Mineral Exploration Trust
Ministry of Mines, Government of India.
New Delhi, Delhi-110001.

Sub: Allocation of funds [₹22,67,37,628 (Rupees Twenty-two crores sixty-seven lakhs thirty-seven thousand six hundred twenty-eight only)] for carrying out analysis of pending GGCMP survey samples

During the National Geo-Chemical Mapping Program (NGCMP), the Commissioner of Geology and Mining (CGM), state of Gandhinagar and GSI collaborated to launch the Gujarat Geo-Chemical Mapping Program (GGCMP). A total of 17,680 samples were collected by the CGM for this program. The CGM has already analyzed different packages on these samples. However, 9932 more samples could not be analyzed primarily because of fund constraints and relocation of the laboratory.

CGM has also conducted a similar geochemical mapping program in the Kachchh area, entitled KGCMP. A number of very encouraging REE-rich zones in the Kachchh area could be identified through this KGCMP program. The already analyzed samples of GGCMP have also showed some encouraging values in the eastern part of the state (GGCMP results). It is hoped that analysis of pending samples from the GGCMP samples might bring out more areas rich in REE elements.

Now, through this proposal, the CGM is asking a funding support from the NMET so that analyses of the pending samples could be carried out as per the protocol set by the Geological Survey of India.

A brief of the justification for analysis of pending GGCMP samples, the sample collection procedure, procedure for pre-processing and processing of samples and the analytical protocols followed in the laboratory of the CGM as per the protocols set out by the Geological Survey of India is given in Annexure-I. A summary cost sheet that would be incurred the sample analysis cost as per the SOC, set out by the NMET is also given in Annexure-I. The total estimated cost for the analyses would be ₹22,67,37,628 (Rupees Twenty-two crores sixty-seven lakhs thirty-seven thousand six hundred twenty-eight only). This excludes sample pre-processing and handling charges in case they are sent to outsourced laboratories.

It is requested that NMET allots the fund to the tune of 22,67,37,628 (Rupees Twenty-two crores sixty-seven lakhs thirty-seven thousand six hundred twenty-eight only) for carrying out analyses of pending samples from the GGCMP survey.

Thanking you.

Your Faithfully,

Dhaval

26/6/23

(Dr. Dhaval Patel, IAS)
Commissioner
Geology and mining,
Gujarat State, Gandhinagar

Enclosed: As above

Copy to: Joint secretory, Industry and mine department, New Sachivalay, Gandhinagar

Proposal for funding allocation for geochemical analysis of 9932 GGCMP samples

Commissioner of Geology and Mining (CGM), Gujarat

Annexure-I

1. Justification for analyses of pending GGCMP samples:

The samples recommended in the proposal for the chemical analysis are part of the collected NGCMP samples in the state of Gujarat. The ultimate goal of the NGCMP is to produce a seamless geochemical map of various elements for the entire state of Gujarat in order to produce a geochemical database for multipurpose applications, functioning as **baseline data** with respect to the following:

- Natural resource development and management
- Environment
- Soil and agriculture
- Human health
- Water resources.

The GGCMP samples were collected in accordance with the accepted protocols, and will also be analyzed following the standard protocols, set up by Geological Survey of India (*Standard Operating Procedure for National Geochemical Mapping and Quality Management*) which will make the procedure SOP driven and nationally accepted.

Apart from the aforesaid importance, the collected samples of the GGCMP program include part of the eastern Gujart, comprising a significant mineralized belt with respect to "Mineral System Analysis" framework (*Fig. 1, 2*). Hence, analysis of the GGCMP samples is necessary for confirmation of the existing mineralized belt which may aid in narrowing down a large geographical area to a smaller and more potential mineralized zone, that could be further designated as OGP (Obvious Geologic Potential).

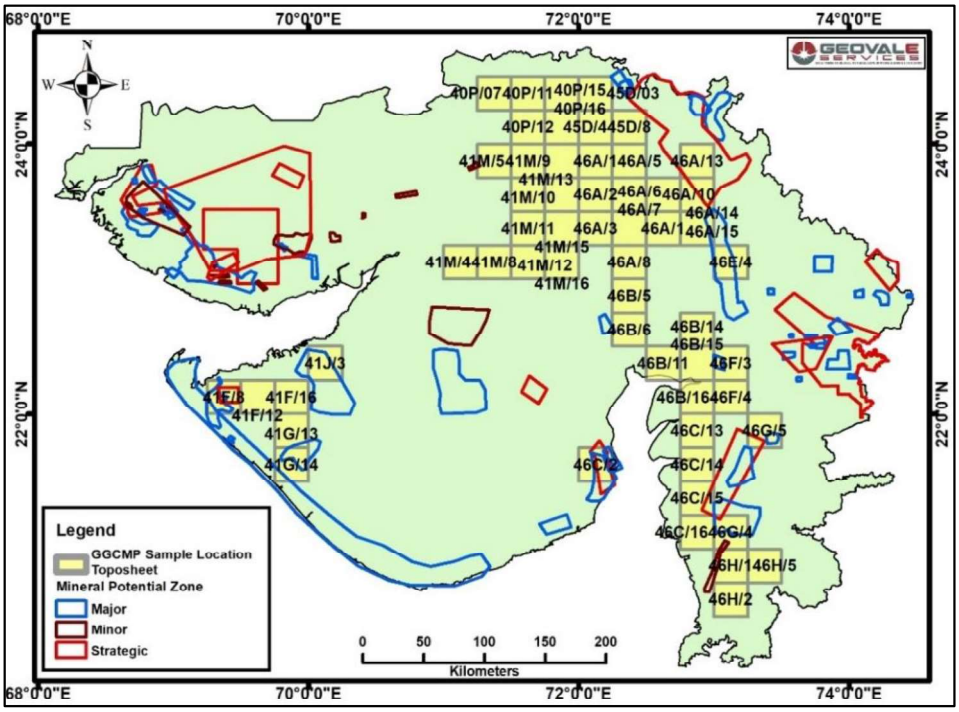

Figure 1: Toposheet of the GGCMP Sample locations.

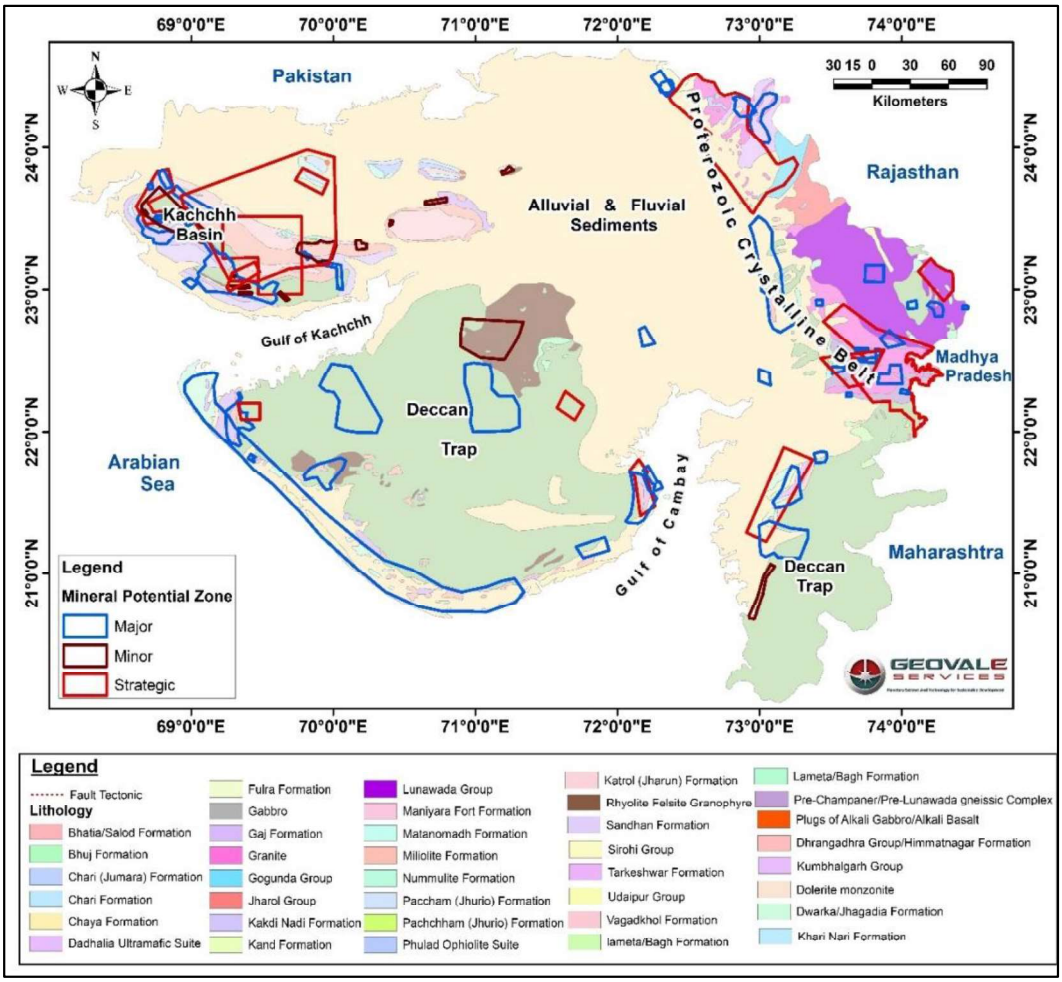

Figure 2: Different Mineral Potential Belt of Gujarat

The sample analysis result would also serve as supporting data for the interpretation

of the upcoming National Aero-geophysical Mapping Program of Block-15 for the year 2023–25.

2. Sample collection procedure:

A regular process was followed in the field during sample collection, considering two different categories of samples viz.

i. Stream sediment sample or slope wash samples and
ii. Regolith or soil samples.

Stream Sediment (SS) or slope wash (SW) Samples:

A stream sediment sample is generally represented by fine clay or silt size particle which are mainly transported by the stream. The samples were collected in a grid pattern of 1 km*1 km grid on the toposheet, and a grid of 2 km*2 km was used for the composite stream samples. Within each grid the sediment sample were collected at 4 to 5 places along the bed of 1^{st}, 2^{nd}, or 3^{rd} order stream. Slope wash samples were taken from four to five different locations within a grid to obtain the best representative sample of the cell if no stream was present within the grids. After screening with a regular sieve, around 6 to 7 kg samples of stream sediment or slope wash were taken from the field. When collecting stream sediment samples, duplicate stream samples were also taken.

Regolith or soil sample:

The topsoil horizon, excluding the top organic layer, is known as regolith. The soil sample was taken from a depth of 25 cm. For the regolith and soil sample collection a grid of 5'*5' was followed. These samples were taken from the area where the road is being cut or excavated. Agricultural lands were not included for sample collection because of contamination. Areas where the bed rocks were available within 2m depth were the good locations for the sample collection. To obtain soil samples where there is no cut section available, 1-square-meter wide, 2-meter-deep trenches were made.

3. Sample Processing Methods:

Sample processing of the collected samples was also done following a standard protocol (*Standard Operating Procedure for National Geochemical Mapping and Quality Management*), described below.

Stream Sediment or slope wash Samples processing:

Within the camp the completely dry stream sediment was processed using 120 mesh. Around 500 gm sample was collected for each unit cell after homogenization, coning and quartering. Then the sample was divided into two equal half of 250 gm. One part is reserved as original sample and the other part was mixed with the neighboring 3-unit cell sample making a sample of 2km*2km grid. Then the entire sample was separated into two equal halves, each weighing 500gm, after mixing and homogenization. This is the composite sample. One of the two parts was set aside for the future, and the other would be sent to the lab for analysis.

Regolith and soil sample processing:

The regolith sample was taken, dried, and then sieved using a 120-mesh screen. One process sample weighing 500 gm will be sent to the lab for chemical analysis, while the other 500 gm will be stored for later use.

4. Sample Analysis Methods:

The following table shows the details of different elements to be analyzed for the GGCMP samples through different analytical methods following standard operating procedures, set by Geological Survey of India (*Standard Operating Procedure for National Geochemical Mapping and Quality Management*).

Oxides/Elements	Method of Analysis
SiO_2, Al_2O_3, Fe_2O_3, Na_2O, K_2O, TiO_2, CaO, MgO, MnO, P_2O_5	XRF
Ba, Cr, Cu, Ni, Pb, Rb, Sc, Sr, V, Zn, Zr, Co, Ga, Nb, Th, Y	
Au	AAS-GTA
Li	AAS-Flame

Oxides/Elements	Method of Analysis
As, Bi, Sb, Se, Te	AAS-FIAS
Fluoride (F)	ISE
Ag, Cd	AAS_C>TA
Hg	OMA
La, Ce, Pr, Nd, Eu, Sm, Tb, Gd, Dy, Ho, Er, Yb, Lu,Tm	ICPMS
Be, Ge, Hf, Ta,U,W	
Pl, Pd	ICPMS
Cs, Sn, Mo,In & Ti	ICPMS

5. Number of collected samples from different toposheet:

Sl. No.	Toposheet no.	No. of steam sediment composite samples	No of soil samples Mesh size	Mesh size	Media SS / Soil / Humus
1	41M/10	180	18	120	SS / Soil
2	41M/11	180	18	120	SS / Soil
3	41M/12	181	14	120	SS / Soil
4	41M/13	181	16	120	SS / Soil
5	41M/14	176	25	120	SS / Soil
6	41M/15	180	12	120	SS / Soil
7	41M/16	178	12	120	SS / Soil
8	46B/11	138	9	120	SS / Soil
9	46B/14	164	12	120	SS / Soil
10	468/15	151	14	120	SS / Soil
11	46B/16	151	16	120	SS / Soil
12	46C/2	155	14	120	SS / Soil
13	45D/3	179	18	120	SS / Soil
14	45D/4	177	12	120	SS / Soil
15	45D/8	179	10	120	SS / Soil
16	46A/1	172	12	120	SS / Soil
17	46A/2	182	0	120	SS / Soil
18	46A/3	182	18	120	SS / Soil
19	46A/5	182	6	120	SS / Soil
20	46A/6	169	12	120	SS / Soil

21	46A/7	168	10	120	SS / Soil
22	46A/8	154	8	120	SS / Soil
23	46A/10	172	18	120	SS / Soil
24	46A/11	179	8	120	SS / Soil
25	46A/13	164	12	120	SS / Soil
26	46A/14	181	14	120	SS / Soil
27	46A/15	181	3	120	SS / Soil
28	46B/5	167	0	120	SS / Soil
29	46B/6	180	8	120	SS / Soil
30	46F/3	130	0	120	SS / Soil
31	46F/4	175	0	120	SS / Soil
32	46C/13	141	8	120	SS / Soil
33	46C/14	147	9	120	SS / Soil
34	46C/15	165	0	120	SS / Soil
35	46C/16	127	4	120	SS / Soil
36	46H/1	144	7	120	SS / Soil
37	46H/2	182	17	120	SS / Soil
38	46H/5	168	14	120	SS / Soil
39	46G/4	167	0	120	SS / Soil
40	46G/5	150	9	120	SS / Soil
41	46E/4	174	0	120	SS / Soil
42	41J/6	165	0	120	SS / Soil
43	41F/16	182	9	120	SS / Soil
44	41G/13	168	10	120	SS / Soil
45	41G/14	175	5	120	SS / Soil
46	40P/16	182	0	120	SS / Soil
47	41F/8	180	9	120	SS / Soil
48	41F/12	170	9	120	SS / Soil
49	40P/7	174	0	120	SS / Soil
50	40P/11	178	18	120	SS / Soil
51	40P/12	168	0	120	SS / Soil
52	40P/15	148	17	120	SS / Soil
53	41M/4	148	2	120	SS / Soil
54	41M/5	159	0	120	SS / Soil
55	41M/8	177	12	120	SS / Soil
56	41M/9	181	16	120	SS / Soil

	Total	**9408**	**524**		
	Total Sediments sample and soil sample	**9932**			

6. Summary Cost sheet:

A total number of 9932 samples will be analyzed through different analytical methods. Below is the table of summary cost including the cost of the sample analysis in different methods, following the SOC, set by NMET.

S.N.	Instrument Name	Analyzed Elements	Total Samples	Unit Cost	Total Cost
1	XRF	26	9932	4200	41714400
2	ICP-MS	22	9932	7731	76784292
3	ISE	1	9932	2320	23042240
4	DMA	1	9932	1060	10527920
5	Flame AAS	2	9932	2506	24889592
6	Hg-AAS	3	9932	2506	24889592
7	Gf-AAS	4	9932	2506	24889592
Total Cost		**22,67,37,628**			