A REPORT ON THE DELIBERATIONS OF THE WORKSHOP ON "THRESHOLD VALUE OF MINERALS FOR SOUTHERN STATE" PANJIM-GOA 21ST JULY, 2017

1.0 Introduction:

Indian Bureau of Mines is a subordinate department under the Ministry of Mines, Govt. of India and is responsible to ensure Scientific and Systematic mining, Conservation of Minerals, Protection of Environment in 'major' minerals in the country. To ensure of conservation of minerals, Indian Bureau of Mines has initiated various measures, issued guidelines and also carried out Research and Development study for utilization low grade minerals. Recognising the importance of "todays waste is tomorrow's wealth", Indian Bureau of Mines is notifying ***Threshold Value of Minerals*** (THV) from time to time for important minerals. Threshold value is a cut-off value below which mineral obtained after mining can be discarded as waste. The first notification of threshold values of minerals was issued by Indian Bureau of Mines in 1990. Subsequently, Indian Bureau of Mines has revised the threshold values in October 2009. Since last notified THV in 2009, many representations have been received from various mining companies and stake holders, requesting Indian Bureau of Mines to review and revise the threshold values of minerals. Therefore, Indian Bureau of Mines decided to hold four workshops across the country in order to take stock of the situation and assess the stakeholder's views through deliberations. First such workshop for Southern States comprising of Andhra Pradesh, Goa, Karnataka, Kerala, Tamilnadu, Telangana, and part of Maharashtra States was organized at Krishna das Shama Goa State Central Library, Sanskriti Bhavan Patto, Panjim-Goa on 21st July 2017. About 140 delegates participated in the aforesaid workshop.

2.0 Inaugural Session

2.1 Dr. Ranbir Singh, Principal Secretary to the Govt. of Goa was Chief Guest while Shri Ranjan Sahai, Controller General, IBM presided over the function. At the outset to mark the inauguration of the workshop, traditional lamp was lightened at the hands of dignitaries. Dr. Y.G.Kale, Regional Controller of Mines, Indian Bureau of Mines, while welcoming the dignitaries and participants, highlighted the importance of minerals to human civilization and conservation of minerals. In this context

he invited attention of the house towards Para 7.2 of the National Mineral Policy-2008 which states that conservation of minerals shall be construed not in the restrictive sense of abstinence from consumption or preservation for use in the distant future but as a positive concept leading to augmentation of reserve base through improvement in mining methods and beneficiation and utilization of low grade ore and rejects and recovery of associated minerals. Dr. Kale also cited some recent development for consumption of minerals and their substitution and advocated for forecasting the technology of future and stressed for mineral intelligence.

2.2 Shri S.K.Adhikari, Chief Mining Geologist, IBM, Nagpur threw light on the evolution of the concept of threshold value. He highlighted the present threshold value with special reference to iron ore. Shri Adhikari informed that in 2009 the threshold value of iron was lowered from 55-58% Fe to 45% Fe. He also briefed on the mineral wise present, projected & future demand pattern of market, technological options available and other factors which plays role on deciding the threshold value of minerals.

2.3 Dr. Ranbir Singh, Principal Secretary, Govt. of Goa and Chief guest of the inaugural session in his address highlighted the importance of minerals. Dr. Singh advocated for measures to protect the environment and ecology while harnessing the mineral resources. He urged mining industry to adopt innovative mining methods so that mining can be carried out with minimum ecological imbalance. He further informed that sustainable mining in all its dimension demands for responsible mining and current generation is only trustee of minerals resources. Dr. Singh appreciated the role of Indian Bureau of Mines and expressed need for augmentation of mineral resources through exploration, improved mining method and beneficiation and expressed ultimate goal of achieving the zero waste mining.

2.4 Shri Ranjan Sahai, Controller General, IBM in his presidential address as presiding officer highlighted the importance of intergenerational equity. He stressed the need to adopt technology driven mining. He briefed about various major initiatives undertaken by the Govt. of India after the amendments in Mines and Minerals (Development & Regulation) Act in January 2015. He informed that in future space technology would be vital for mineral administration and cited

example of “Mining Surveillance System” (MSS) and “Sudoor Drishti” the two projects undertaken by Indian Bureau of Mines with help of Bhaskaracharya Institute for Space Applications and Geo-Informatics (BISAG) and National Remote Sensing Centre (NRSC) for monitoring of mining activity through satellites under the Prime Minister’s vision of “Digital India”. He also indicated that Star Rating Evaluation is now mandatory under Mineral Conservation and Development Rules 2017. He hoped that Star Rating evaluation by IBM would be a sort of social certification to operate the mine. He also highlighted the salient features of Mining Tenement System (MTS) project being undertaken by Indian Bureau of Mines. He expressed confidence that deliberation of the workshop would be helpful to review and revise the threshold value of minerals.

2.5 The proceedings of the inaugural session was conducted by Shri Parag Tadlimbekar, Suptdg. Mining Geologist, IBM, Nagpur while Shri Suresh Prasad, Dy. Controller of Mines, IBM, Goa proposed the Vote of Thanks.

3.0 Technical Sessions:

The deliberations of the workshop were organized in four Technical Sessions:

3.1 Technical Session -I on Iron ore

The session was co-chaired by Shri C.E.Kindo, Executive Director (PC) NMDC Ltd., Shri Sauvick Mazumdar, Chief Executive Officer, M/s Vedanta Ltd., Dr. Meda Venkataiah, Executive Director, MSPL Ltd and Shri P. Banerjee, Director, M/s Fomento Resources.

3.1.1 The first presentation was made by Shri S.K. Adhikari, CMG, IBM, Nagpur to appraise the house regarding gist of the various representations received by IBM on revision of threshold value of iron ore. In his presentation Shri Adhikari threw light on the threshold value of minerals that existed in 1990 and notified in 2009. He informed that by lowering of threshold value of iron ore from 58-55% Fe to 45% Fe for haematitic ore coupled with exploration inputs, the iron ore resources of the country is augmented by 53% as on 2015. He gave a brief summary of the various beneficiation studies carried out by IBM in the recent past on iron ore samples of southern region. He presented a summary of suggestions received from various stakeholders, mine owners and various associations for review

of the threshold value of iron ore in the country. He presented the gist of the suggestions received as follows:

Stakeholders/ Organisation	Suggestion
Vedanta/Sesa Sterlite	Hematitic Siliceous ore- Fe% (+35%)- for Goa & Karnataka Hematitic ore- Fe% (+45%)
FIMI	Hematitic iron ore-50% Fe(Min) Hematitic siliceous ore(Goan & Karnataka)-35% Fe(Min) Magnetite iron ore-20% Fe(Min)
Goa Mining Association	Hematitic ore-50% of Fe(Min) Siliceous ore-35% of Fe but FeO>1.5 %
GMOEA	Hematitic ore-50% of Fe(Min) Siliceous ore is to be dropped or qualified with min of 1.5 % of FeO.
Chaitanya Geo Linx	Siliceous ore of Karnataka and Goa-35 to 45 % Fe Magnetite bearing Ore-FeO>10%
TATA	Hematitic ore- Fe%-45% Alumina content 10% max. (for Jharkhand & Odisha Iron ore area) Magnetic ore(BMQ)- Fe-30%(min) at optimum liberation size as applicable and concentrate grade of approximately 64% Fe

3.1.2 Mr. Glenn Kavalampara, Secretary, Goa Mineral Ore Exporters Association (GOMEA) in his presentation highlighted the historical perspective of Goa's Iron ore resources, statistical analysis of production and export, concern for the Goan mining industry, characteristics of Goan Iron ore and present market scenario. He indicated that with present day technology available, the Goan hematite iron ore can be upgraded by just 2-4 units having tailing loss of 25- 30. He also pointed out that because of low quality of Goan iron ore, there are no takers from domestic sectors and Goan miners have to depend solely on the export market. He suggested that the threshold value for Goan hematite ore should be raised to 50% Fe content, while silicious ore with magnetite may be retained at 35% Fe content but suggested it to be qualified with a minimum of 1.5%FeO.

3.1.3 Shri Vijay Kumar, Head Iron ore Division, Goa, M/s Vedanta Ltd endorsed the view of Mr. Glenn Kavalampara and indicated that since iron ore of Goa is of inferior quality

compared to other iron ore in rest of the country therefore, require special attention. Shri Rajeev Kumar, General Manager of M/s Fomento also expressed similar views and suggested that mineral reject should not be a part of ROM production.

3.1.4 Shri G. Shirish, Sr. General Manager, M/s V.M.Salgaocar Bros. Pvt. Ltd. invited attention on the recent e-auction conducted by the Govt. of Goa and also gave statistical analysis of e-auctioned ore. He pointed out that there are no takers for the low grade Goan iron ore. He further indicated that the ROM above the threshold value and below the cutoff value of market remain as an asset on the part of the lessee and therefore, is liable for Income Tax assessment.

3.1.5 Shri P. Banerjee, Director, M/s Fomento suggested that non-salability and non- usability factors should also be defined in the threshold value.

3.1.6 Shri Y.S.Reddy, from Fomento Resources expressed that excavation should have lithological classification. Other than laterite and clay may be considered as ore. Need of the hour is to store it in recoverable way. Shri S. Mazumdar, M/s Vedanta Ltd suggested that commercial and economical consideration should also be taken into account and cut-off grade should also be included in the threshold value.

3.1.7 Shri Sunil Pandey, Head Mining, Jindal Saw, Rajasthan suggested that there should be separate threshold value for Magnetite ore. Shri Upkar Gupta, DGM, Timblo Pvt. Ltd suggested that market economics should also be included while deciding the threshold value of minerals.

3.1.8 The third presentation was delivered by Shri Krishna Reddy, M/s Vedanta Ltd. representing Karnataka State. His presentation briefed on the important highlights of National Mineral Policy-2008, National Steel Policy-2017. He cited an example to show that how mineral exploration has helped to augment the mineral resource. He pointed out that presently only for Goan origin iron ore, threshold value for hematitic silicious ore has been prescribed and informed that such ore is also available in Karnataka State wherein there is need to separate it from waste and therefore, expressed need to prescribe the same as 35% Fe content for Karnataka State as well.He cited the example of iron ore sample from his mines for which beneficiation study has been carried out by IBM. He stated that the as received sample assayed 41.55% Fe(T), 37.14% SiO_2 , 1.33% $Al2O_3$, 0.09%CaO,0.01% MgO, 0.02% TiO_2,

0.019% P, 0.305 Mn and 1.05% LOI. The mineralogy of the sample revealed that hematite is the main mineral in the sample whereas goethite is in minor amounts, quartz is the main gangue mineral having fine inclusions with hematite grains at fine size. Clay, mica, feldspar and chlorite are in very minor to trace amounts. Beneficiation process preferred was Dry sieving of the as received sample on 5mm, 3mm, 10 mesh and 40 mesh sieves which yielded a composite + 40 mesh fraction assaying 56.81% Fe(T), 14.36% SiO_2, 1.81% Al_2O_3 and 1.19 % LOI with 62.9% Fe(T) recovery (wt% yield 45.9). Thus a simple process of dry sieving yields a product assaying 56.81% Fe(T) from a original feed of assay 41.55% Fe(T) with a weight percent yield of 45.9. Blending of + 5 mm fraction with magnetics of - 5mm + 40 mesh. This process yielded a composite concentrate assaying 57.90% Fe(T), 13.08% SiO2. 1.73 %Al_2O3 and 0.97 % LOI with overall weight percent yield of 42.5 (overall Fe(T)recovery of 59.3%. The wet process comprised of jigging on composite of + 40 mesh sieved fraction and magnetic separation on - 40 mesh screened fraction. The Jig concentrate and magnetics of - 40 mesh fraction yielded a composite concentrate assaying 62.00%o Fe(T), 7.77% SiO_2, 1.44% Al_2O_3 and 0.91% LOI with overall weight percent yield of
38.3 (overall Fe(T) recovery of 57.2%). He further mentioned that the threshold value of Hematitic ore for Karnataka State be maintained at 45% Fe content.

3.1.9 The last presentation in Iron ore session was made by Dr. Meda Venkataiah, Executive Director, MSPL Ltd. He indicated that the present conversion cost of up gradation to 63.5% Fe content is around Rs 400 to 500 depending on the mineralization for feed grade of 52% Fe content. He further pointed out that if the feed grade is around 45% Fe of hematite nature, its conversation cost is around Rs 1200. In present market scenario it is not economical unless the ore is of magnetic in nature. Dr. Venkataiah supported his cost-economics with the iron ore fines recent price list declared for NMDC's Donimalai Iron Ore Mine. He invited attention of the house towards the National Steel Policy 2017 which says that "utilization of low grade fines lying at mine sites of captive iron ore miners will be promoted with any regulatory changes necessary. Beneficiation and agglomeration industries would be strengthened through suitable support". To achieve the envisaged measure, he suggested for incentives to mine the low grade ores and stock and also demanded that no royalty should

be charged if beneficiation is undertaken within the lease for lean iron ore lower than marketable grades.

He suggested that present threshold value of 45% Fe for Hematite ore should be continued. However for silicious ore 35% Fe content should be prescribed as threshold value. He further suggested that if magnetite deposits are available in existing leases or future leases, threshold value of 35% Fe can also be prescribed with certain monetary incentives.

3.2 Technical Session-II, Manganese Ore

3.2.1 The second technical session held on Manganese ore was co-chaired by Shri G. P. Kundargi, former Chairman-cum-Managing Director, MOIL Ltd. and Shri U.R. Acharya, Director Commercial, M/s Sandur Manganese & Iron Ore Ltd (SMIORE), Karnataka.

3.2.2 In the begining Shri S.K.Adhikari, Chief Mining Geologist, IBM detailed out the suggestions received from various stakeholders, mine owners and various associations for review of the threshold value of manganese ore in the country. He presented the gist of the suggestions received as follows:

Stakeholders/ Organisation	**Suggestion**
FIMI	*20% of Mn (Min)*
TATA Steel Ltd	*10 % Mn to 20% Mn for Ferrugineous Manganese Ore.*

3.2.3 In this technical session on Manganese ore, a presentation on Manganese ore deposit of SMIORE was made by Shri Shridhar Hegde, Dy. GM, SMIORE. His presentation covered the brief introduction of Sandur Manganese & Iron Ore Ltd and their operating leases. He also covered the status of exploration carried out, Reserve and Resource position, method of mining and beneficiation, market scenario etc. He indicated that the lumpy ore of + 26% Mn content has demand in the market whereas ore of -26% Mn content has limited demand.

3.2.4 Giving the concluding remarks, Shri Kundargi, enlightened the delegates about the old mineral reject dumps found in the MOIL's mines in Maharashtra and Madhya Pradesh States which are now proving as hidden treasure and improved the profitability. Therefore, he emphasized the need for preservation of such low grade ore. While deliberating

characteristic of manganese ore available in the country and present technology available vis-à-vis market demand, Shri Acharya was of the opinion that the present threshold value of 10% Mn (Min) is still relevant and should be continued. Shri Kundargi also endorsed the similar views.

3.3 Technical Session-III, Limestone

3.3.1 The third Technical Session on Limestone was co-chaired by Shri D.B.N.Rao, former Director General, National Council for Cement and Building Materials (NCCBM) and presently Advisor of M/s My Home Industries Ltd, Shri Ajit Ostwal, Sr. Vice President, Ultra Tech Cement Ltd, Mumbai, Shri S. Chakrabarti, Sr. Vice President, Ultratech Cement, Rajashree Limestone Mines and Shri V. Karthikeyan, Assistant Executive Director, Dalmia Cements Ltd.

3.3.2 Before the presentations from the industry side, Shri S.K.Adhikari, Chief Mining Geologist, IBM briefed the house regarding various suggestions received from stakeholders for review of the threshold value of limestone in the country. He presented the gist of the suggestions received as follows:

Stakeholders/ Organisation	Suggestion
FIMI	i)For Limestone deposits in Chhattisgarh, Gujarat, Himachal Pradesh, Madhya Pradesh, Maharashtra, Rajasthan, Uttarakhand & Uttar Pradesh -- CaO - 30% (min), MgO - 4% (max). (ii) For Limestone deposits in Andhra Pradesh, Jharkhand, Karnataka, Kerala, Orissa and Tamilnadu - CaO - 32% (min), MgO - 4% (max), SiO_2- 20%(max) & Alkalies- 0.5%(max)
Dalmia Cements (Bharat Ltd)	CaO - 40% (min), MgO - 5% (max), SiO_2- 18%(max), Al_2O_3- 3.5% (max),Fe_2O_3 – 3% (max),SO_3- 0.85(max) & Alkalies - 0.5%(max)

3.3.3 In this technical session first presentation was made by Shri Ajit Ostwal, Sr. Vice President, Ultra Tech Cement Ltd. In his presentation he covered the present threshold value for limestone for different states. He indicated that 97% of limestone mined in the country is of cement grade whereas Iron

and Steel grade and chemical grade constitute just 2 and 1% respectively. He suggested that the threshold value of limestone should be revised based on the type of the limestone available viz. Sedimentary or Metamorphic rather than on regional basis. He further pointed out that most of the limestone deposit available for cement industries are of marginal grade. The NCCBM suggested limiting CaO content to 40% for prospecting limestone deposit whereas acceptable range for manufacture of OPC grade cement is 44-52% CaO content. He further indicated that fuel plays an important role to decide cutoff limit of ROM limestone quality. He indicated that although the pet-coke increases the efficiency of limestone consumption but its availability on regular basis is not certain. Further, high sulphur in pet-coke put restrictions in some of the limestone deposit having inherent SO_3 . He further indicated that additive minerals like Laterite, Bauxite, Red Ochre, Iron Ore etc. also plays role in cutoff value of ROM Limestone and increase in silica content in such additives further demands higher CaO content limestone. He suggested that considering the technological constraints, threshold value for limestone resources should be considered as 38% CaO, 5% MgO, SO3 <=0.80% and Alkalies <0.16%. To consider his suggestion he has also presented Limestone feasibility sensitivity with cutoff of CaO content for different grades.

3.3.4 The second presentation in Limestone session was made by Shri Nitin Purohit, General Manager, J.K. Cements Muddapur and Shri P.Shrivastava, Quality Head, J.K.Cements, Muddapur. The problems of high silica content in the deposit were also discussed in the presentation.

3.3.5 Dr. V.A.J.Aruna, Suptd. Officer (OD), IBM, Bangalore highlighted about the laboratory scale investigations carried out by Regional Mineral Processing Laboratory, Bangalore for removal of silica from the samples of J.K.Cements Ltd., Muddapur, Karnataka. He stated that the as received (Core) sample assayed 33.68 % CaO, 22.75% SiO_2 (T), 3.06 % MgO, 3.13 % Fe_2O_3, 4.25% Al_2O_3, and 30.20% LOI. By adopting the flotation test produced the concentrate assayed 49.15 % CaO, 5.32 % SiO_2 (T) with 82.4% CaO recovery (Wt % yield 58.20). Mineralogical analysis of the as received sample revealed that carbonate (calcite) and serpentine/pyrophyllite are the major minerals present in the sample. Chlorite, quartz,

goethte/limonite, biotite mica, muscovite mica, hematite, talc, pyrite and chalcopyrite are present in minor to trace amounts.

Anionic rougher flotation followed by single stage cleaner flotation yielded a concentrate assaying 45.64% CaO, 9.1 % SiO2 (T) with 91.3 % CaO recovery (Wt % yield of 69.4). Alternatively, cationic reverse flotation yielded a concentrate assaying 47.31% CaO, 8.8% SiO2,with 68.4% CaO recovery (wt% yield of 50.1). The concentrate obtained is suitable for cement manufacturing.

3.3.6 Deliberating on the subject matter Shri D.B.N.Rao, Former Director General, NCCBM informed that to consume 38% CaO content Limestone, one has to add 56% content CaO limestone as sweetener and every cement plant is not blessed with such high grade limestone.

3.3.7 Highlighting, the recent cases of auctioning of limestone blocks, Shri Karthikeyan pointed out that resources below the cutoff value of Cement Plant and above the threshold value is also being considered while deciding the value of minerals resources and thus prospective bidder has to pay higher value for minerals which is not consumable.

3.3.8 Shri Mukesh Sinha, Dalmia Cement, Bagalkot invited attention of the house regarding recent National Green Tribunal (NGT) order which has banned use of Pet-coke in 17 industries including cement manufacturing which will adversely affect the consumption of low grade limestone. He also pointed out that Governments of Karnataka, Madhya Pradesh etc. are charging stamp duty on the percentage of minerals content. Considering all these issue the house was of the opinion that threshold value for limestone may be raised from present 35% CaO content to 38% CaO content.

3.4 Technical Session-IV, Bauxite

3.4.1 Fourth Technical Session on Bauxite was co-chaired by Shri Mainak Chakraborty , Head –West Coast Mines M/s Hindalco Industries Ltd and Dr. Anil. R. Kulkarni, Prof & Head, Dept. of Environmental Management, Chh. Shahu Institute of Business Education & Research, Kolhapur.

3.4.2 Shri S.K.Adhikari, Chief Mining Geologist, IBM briefed the house regarding various suggestions received from stakeholders for review of the threshold value of bauxite in the country. He presented the gist of the suggestions received as follows:

Stakeholders/ Organisation	**Suggestion**
FIMI	(i)For Aluminous Laterite: Al_2O_3 - 20% (min) (ii) For Bauxite: Al_2O_3 - 35% (MIN) and silica (reactive) - 5% (MAX)
HINDALCO	(i) Eastern Ghats Al_2O_3 > 40% ; SiO_2 > 5% (ii) Western Ghats - Al_2O_3 < 35% ; SiO_2 > 5% (iii) Coastal Plains- No comments
NALCO	(i) Aluminous Laterite: Al_2O_3 - 20% (min) SiO_2 – 7%(min) (ii) Bauxite: Al_2O_3 - 20% (min) and silica (reactive) - 5% (max and7% total silica
L&T	Bauxite: Al_2O_3 > 40% and silica (reactive) < 4%

3.4.3 In the technical session on Bauxite, Shri Uday V. Pawar, General Manager, Hindalco Industries Ltd. made a presentation with specific reference to West Cost Mining of M/s Hindalco Industries Ltd. He indicated that although the present threshold value for Bauxite is 30% Al_2O_3 with 5% maximum Silica reactive, Hindalco Industry Ltd- West Coast Mining is utilizing the Bauxite of low grade through blending with high grade. He suggested that threshold value for Bauxite for West Coast deposit may be increased to 35% Al_2O_3 and for East Coast deposits to 40% Al_2O_3 with 5% maximum reactive Silica.

3.4.4 No issues were raised by any of the participants regarding revision of threshold value of Magnesite and Graphite minerals.

4.0 Concluding Session

4.1 Shri Ranjan Sahai, Controller General, IBM. chaired the concluding session. Dr. Y.G.Kale, summarised the deliberation of the day's workshop and requested the participants to submit further suggestion if any with technical analysis and supported by scientific data. All the suggestion will be examined while

finalising the revision of threshold value of minerals after all the proposed workshops are held.

4.2 Shri Parag Tadlimbekar, Suptdg. Mining Geologist, IBM presented the Vote of Thanks and thanked all the participants and speakers for their valuable contribution and fruitful discussion in the workshop.

The workshop ended with a vote of thank to the chair

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List of participants in Threshold Value Workshop held at Goa on 21st July 2017

Sl. No.	Name	Designation	Organization
1	Shri Ranjan Sahai	Controller General	IBM,Nagpur
2	Shri S.K.Adhikari	Chief Mining Geologist	IBM Nagpur
3	Shri Y.G.Kale	Regional Controller of Mines	IBM,Goa
4	Shri P.M Tadlimbekar	Suprintending Mining Geologist	IBM Nagpur
5	Dr. V.A.J.Aruna	Suprintending Office (OD)	IBM Bangalore
6	Shri P.Prakash	DCOM	IBM Goa
7	Shri Suresh Prasad	DCOM	IBM Goa
8	Shri Kalmata M.K	SMG	IBM Goa
9	Shri G.S.Kannan	JMG	IBM Goa
10	Shri A.D Gupta	AMG	IBM Nagpur
11	Shri R.S.Saudagar	STA ME	IBM Goa
12	Shri V.V Tari	STA ME	IBM Goa
13	Shri N. Sheshadri	AAO	IBM Goa
14	Shri A.S Chari	STA Drg	IBM Goa
15	Shri Robby Lobo	D'Man	IBM Goa
16	Shri B.K.Sharma	PA to RCOM	IBM Goa
17	Shri Bharat A Zambaulikar	ASK (T)	IBM Goa
18	Shri Rajiv Kumar	Sr. General Manager	Fomentao Resources
19	Shri Sanjay Albento	General Manager	Timblo Pvt Ltd
20	Shri R.K.Singh	General Manager	Pandurand Timblo Industries
21	Shri D.P.Pawar	Sr Mines Manager	Fomentao
22	Shri Victor Fernandes	Sr Mines Manager	Fomento Resources
23	Shri Upkar Gupta	DGM	Timblo Pvt Ltd
24	Shri Sandeep Marazkar	Sr Manager	R.S Shetye
25	Shri Vijar Kumar	Head Iron ore Goa	Vedanta
26	Shri Rajesh Kuslawaha	Mines Manager	M/s Bandekar Bros Pvt

			Ltd
27	Shri Saroj Kumar	General Manager	TPL
28	Shri Glenn Kalabvampara	Secretary	GMOEA
29	Shri Tereza Maria de Souza	Jt Secretary	GMOEA
30	Shri Satesh L	Assistant Mines Manager	M/s Bandekar Bros Pvt. Ltd
31	Shri K.B.Haldenkar	Mines Supdg.	M/s Bandekar Bros Pvt. Ltd
32	Shri R.B.Singh	Mines Manager	M/s Chowgule & Co
33	Shri Lalit Mohan Garg	Head Technical	M/s Jindal Saw Ltd Rajesthan
34	Shri Sunil Pandey	Head Mining	M/s Jindal Saw Ltd Rajesthan
35	Shri Ajit Ostwal	Sr. VP	Ultratech Cement Ltd
36	Shri Kapil Kher	Sr GM	Ultratech Cement Ltd
37	Shri Yatin Gulawani	Manager	Earth Mover
38	Shri Godfuy Perin	Manager	M/s Chowgule & Co
39	Shri Narayana Prasad	General Manager	Fomento Resources
40	Shri Leena V	Camp officer	Vedanta sesa Iron
41	Shri Nayak Singh	Manager	DMC
42	Shri M.K. Bhat	Dy Genreal Manger	PTI
43	Shri Abhijit Pdenekar	Sr Manager	Fomento Resources
44	Shri A. Prakash	Dy Genreal Manger	PTI
45	Shri M.R Dessai	Assist Manager Env)	Chowgule & Co. Pvt. Ltd
46	Shri S.M.Hegde	Manager Geology	Chowgule & Co. Pvt. Ltd
47	Shri U.M. Nagvenkar	General Manager Mining	Vedanta Ltd
48	Shri DV Pawar	Dy Genreal Manger	Chowgule & Co. Pvt. Ltd
49	Shri Satish Meendrekar	Manager	MSPL
50	Shri Srinivas Charry	Sr. Mines Manager	Fomento Resources
51	Shri Anurag Mishra	General Mnager	Fomento
52	Shri D.R Reddy	Sr. Mines Manager	Fomento
53	Shri S. Mazumdar	Chief Operting officer	Vedanta SesaGoa
54	Shri Harish Rajani	Director	INSL
55	Shri Arvind Dhenge	Manager	Panditrao Mines
56	Shri Ajit S. Nalawade	Manager Geology	Fomento
57	Shri J.Sreedy	Mining Engineer	Fomento
58	Shri Raj Salgaonkar	GM Mining	VMSB
59	Shri Leo Christy	Dy. Chief Geologist	VMSB
60	Shri M.S Goplikar	Chief Manager	BBPL
61	Shri G.Shrish	Sr GM Mine	VMSB
62	Shri Abani Kr Das	Associate Manager	Vedanta Ltd

63	Shri S Pal	Dy Genreal Manger	Fomento
64	Shri P Banarjee	Diector	Fomento
65	Shri Amrit Sable	Manager	Chowgule & Co. Pvt. Ltd
66	Shri Ajay R Borkar	General Manager	VMSB
67	Shri P.K.Joshi	Advisor	Dempo
68	Shri Pramod Rai	Manager	Dempo
69	Shri Prashaw Wagadre	Dy Manager	Dempo
70	Shri Chakarborti	Vice President	Hindalco
71	Shri Vijay Chawhan	Dy Genreal Manger	Hindalco
72	Shri U.V Pawar	General Mnager	Hindalco
73	Shri A Kulkarni	Advisor	Hindalco
74	Shri Pooja Shirodkar	Assitant Manager	Amit Earth Movers
75	Shri Maisie Menezes	Manager PG & QC	Minescape
76	Shri Sandeep Kumbhae	Dy manager Tech Service	Minescape
77	Shri Girish C Kulkarni	Dy. Chief Geologist	VMSB
78	Shri Sudheer Naik	Manager Project	VMSB
79	Shri Cletus D Souza	Sr.Manager	Minescape
80	Shri K.V.Ramana	Vice President	Sagar Cement
81	Shri R.S.K.Kishore	HOD Mining	RBSSD& FNDA
82	Shri K.V.Suresh Reddy	DGM Mines	Bharthi Cement Co Pvt. Ltd
83	Shri G.Bhaskar Reddy	DDMG	DMG, Telangana
84	Shri V.Koteshwara Raju	JDMG	DMG Andhra Pradesh
85	Shri D B N Rao	Advisor	My Home Indust
86	Shri K.Rajsehkar Reddy	GM Mining	Telangana Minerals
87	Shri Kishor Jenekar	Mining Engineer	Aditya minerals
88	Shri C.E.Kindo	Executive Director PC	NMDC ltd
89	Shri KV Sarma	GM Mining	Zuari Cement Ltd
90	Shri B.V Rama Babu	Surveyor	JSW Cement
91	Shri R.K.Garg	Jt General Manager	NMDC ltd
92	Shri S.Seshagiri	Mines Manager	Gogga Gurushantiah & Bro.
93	Shri K.V.Bakthvastala Naidu	Sr. GM (Mines)	Gogga Gurushantiah & Bro.
94	Shri K.Sudhakar	AGM Mines	Kalburgi Cement Pvt. Ltd
95	Shri Pramod S Titti	ADM Geology	BKG Mines
96	Shri Keshav. S.Walvekar	Am>Geology	BKG Mines
97	Shri H.Yellappa	Add. GM Mines	SMIORE
98	Shri Shridhar P Hegde	DGM Mining	SMIORE
99	Shri Shukaraliangoida	GM Production	MML
100	Shri Sunil Kumar G.S	AGM Mines	SMIORE

101	Shri G.Narasimham	Mines Manager	Nuvoco Vistas cor. Ltd
102	Shri Rajesh Garg	VP Mines	Kesarm Industries
103	Shri M.T Jagadeesh	Sr. Manager	Chowgule & Co Pvt Ltd
104	Shri G.Y. Niranjan	Geologist	Gvoda Steel
105	Shri Dhanansaya G Reedy	General Manager	R.Praveen Chandra
106	Shri T.Padharaja	Head Tech	Vedanta Ltd
107	Shri Kerishna Reeedy	General Manager	Vedanta Ltd
108	Shri G S N Murthy	consultant	Mine Owner Association
109	Shri S.N.Hiramath	President Bagalkot Limestone	
110	Shri B.S Burk	Manager ADM	Bagalkot Chemical
111	Shri P Satya Saibar	Head Geologist	
112	Shri S Charkbaty	Sr VP	Ultratech Cement
113	Shri Jagdish	Manager Geology	ACC Cement
114	Shri M.K Sinha	Mines head	Dalmia Industries
115	Shri Shiv	MD	Dalmia Industries
116	Shri D.V.Patel	Owner	Bhagya Laxmi Minerals Indust
117	Shri R.K.Mathod	Owner	Naganapur Lime stone
118	Shri V.R.Mathad	Owner	Mudapur Limestoen
119	Shri Govinda Shetty	Manager lokapur	Muddapur Limestone
120	Shri K.G.Bolishetty	Owner	Lokarpur Limestone
121	Shri Nitin Purohit	GM Mines	Lokapur
122	Shri Prakash Shrivastava	GM Sudhur	Lokarpur Limestone
123	Shri Hemant Verma	Assitt Manager Geo	Lokapur
124	Shri Meda Venkataia	Executive Directro	MSPL Ltd
125	Shri K.H Sabrod	Owner	Ganga Mineral
126	Shri L.S Hiramath	Owner	Lokapur Limestone
127	Shri Pawan Udapudi	Owner	PawanMinerals
128	Shri G.P Kurdegi	Director	SMIORE
129	Shri N.R Sidnal	Owner	Akshay Minerals
130	Shri T.Muruganandam	Dy Director	Geoogy & Mining
131	Shri S.Vedippar	Assistant Director	Geoogy & Mining
132	Shri P Ganavel	Assistant Director	Geoogy & Mining
133	Shri A.Anandha Raja	Dy GM Geology	Chettinad Cement
134	Shri V.Kartikeyan	Assistant Executive Director	Dalmia Cemetn
135	Shri Dhiraj Kumar N Jagdish	Head Growth Project	Vedanta
136	Shri Pramodaran M	Manager Geology	Ultratech Cement
137	Shri Anand Ku R.S	Manager Mining	ACC Ltd
138	Shri Madhu Chitteti	Dy Manager Mining	SAIL Refratroy Co. Ltd
139	Shri Y.R.S Prasad Reddy	GM Mines	Deccan Minerals

Distinguished guests on the dais from left Dr. Y.G.Kale, Regional Controller of Mines, Indian Bureau of Mines, Shri Ranjan Sahai, Controller General, IBM, Dr. Ranbir Singh, Principal Secretary to the Govt. of Goa, Shri S.K.Adhikari, Chief Mining Geologist, IBM,

Participants interacting in the workshop

Speakers and presenters of the Threshold value Workshop at Goa

Shri Ranjan Sahai,
Controller General, IBM

Dr. Ranbir Singh,
Principal Secretary,
Govt. of Goa

S.K.Adhikari,
Chief Mining Geologist,
IBM

Dr. Y.G.Kale, RCOM,
IBM, Goa

Shri PTadlimbekar,
SgMG, IBM

Mr. Glenn Kavalampara,
Secretary, GOMEA

Shri Krishna Reddy,
M/s Vedanta Ltd.

Dr. Meda Venkataiah,
ED MSPL Ltd.

Shri Shridhar Hegde,
Dy. GM, SMIORE

Shri Ajit Ostwal, Sr.VP,
Ultra Tech Cement Ltd.

Shri Nitin Purohit, GM,
and Shri P.Shrivastava,
QH, J.K.Cements,

Shri Uday V. Pawar, GM,
Hindalco Industries Ltd.