NOTE ON "END USE OF MINERAL"
Bamebari Iron & Manganese Mine, M/s Tata Steel Limited

0.83 LTPA of Manganese ore is being mined out from the Bamebari Iron & Manganese Mine to cater to the requirements of its Ferro Alloys Plant at Joda, Jamshedpur Works and other Conversion Units. The company is also purchasing certain amount of ore to meet its requirements at the Ferro Alloys Plant, Joda at a very high cost. This was mainly because of its inability to produce the required quantities of high grade ore with Mn: Fe ratio greater than 5.3:1. In the course of producing higher grade manganese ore, a surplus quantity of medium and low grade manganese ore shall also be produced.

Some small quantities (approximately 10000 TPA) of iron ore is likely to be produced as incidental to manganese ore production. This ore may either be utilized in the company's Sponge Iron Plant at Joda or sold to other outside parties depending upon its quality.

In view of the mineral conservation and proper utilization of low grade manganese ore produced from the mine which amounts to around 25% of total production, Research and development initiatives have been taken up by R & D wing of Tata Steel to come up with a breakthrough beneficiation technique for enriching the low grade manganese ore. The progress in this direction is quite satisfactory and the results are very much promising. This beneficiation would be a first of its kind in India for beneficiation of low grade unusable ore being produced from our mines. In addition, we are also working with R &D for some trial of Manganese ore beneficiation through various methods which is difficult in Ferruginous Mn ore deposits of Odisha.

Further, the Company with its on-going expansion of its Steel making capacities envisages enhancing the Ferro manganese production capacity at its exiting Ferro Alloys Plant at Joda from 0.0540 MTPA to 0.060 MTPA, installing new Silico manganese plant of 0.060 MTPA and one sinter plant of 0.050 MTPA within the existing plant at Joda. Further, company proposes to acquire/make conversion agreement with Silico manganese plants of 0.10 MTPA. The high grade and low grade manganese ore required for production of Ferro manganese and Silico manganese would be produced from Bamebari Iron and Manganese mine including all other manganese mines of the company. In order to meet the higher quantity of raw material requirement, the low grade ores is likely to be beneficiated to meet the quality requirement (subject to economic viability of such beneficiation process) for which the present manual means of processing of manganese ore may be required to be mechanized. Further, company would also use the sintering process to make use of the low grade ore.

As the inventory of Medium grade and Low grade manganese ore lying in the mines is huge and posing space constraint for safe and smooth operation of mines, utilization of these materials through external processing agents to convert manganese ore to SiMn for further use in Tata Steel's plant will facilitate the smooth and safe operations as well as maximize the usage of mineral resource available with them. After obtaining the required permissions from the state government, the company may sell this surplus low and medium grade ore to domestic parties in order to make space to stack manganese ore.

The Ferro Alloys Plant, Joda presently requires an Mn:Fe ratio of 5.3:1 in the manganese ore. The specifications of ore required for Ferro manganese alloy production is as follows:

Mn.	Fe.	SiO2	Al2O3	P	Mn/Fe
46 -48%	8-9%	4.5-5%(Min.)	4%(Max.)	0.15%(Max.)	5-6

Specification of ore produced:

Grade Type	Chemical Specification	Physical Spec.
Chemical Grade / Dioxide	Mn > 48 % & Fe < 4 %	+10 -75 mm, + 6 – 10 mm, - 6 mm
High Grade	Mn > 46 %	+10 -75 mm, + 6 – 10 mm, - 6 mm
Medium Grade	Mn > 35 % & Fe < 26 %	+10 -75 mm, + 6 – 10 mm, - 6 mm
Low Grade	Mn > 25 % & Fe < 35 %	+10 -75 mm, + 6 – 10 mm, -6 mm
Sub Grade Mineral	Mn>10% & <25% &	All Size

The different grades of ore from all the quarries/mines of the Company are ultimately blended in the plant to meet the desired specification as mentioned above for production of Ferro manganese / other alloys. The typical chemical analysis of the above ore types analysed at Company's Geological Laboratory is given in Table A. This laboratory at Joda is recognized by the Directorate of Geology, Govt. of Odisha.

Table : A
(Typical chemical analysis of Manganese Ore)

Grade	Chemical Analysis					Ratio	Oversize %	Undersize %
	Mn%	Fe%	SiO_2%	Al_2O_3%	P%		+75mm	-10mm
Chemical	52.44	6.61	1.54	2.07	0.11	7.94	1.3	4.7
High	46.96	10.68	2.45	2.93	0.08	4.40	1.2	4.9
Medium	38.12	19.30	3.16	3.49	0.07	1.98	1.2	5.2
Low	31.48	23.79	5.30	4.80	0.07	1.32	1.0	5.2

The fines so generated in the course of mining are approximately 5% of the ROM production and is stored separately for future use. Further to increase the recovery of residual lumps from the existing fines, screening will be done during dry season only. With the expansion at FAP, Joda with upcoming sinter plant of 0.050 MTPA, the fines shall be utilized through sintering process.

For TATA STEEL LTD.
By their Constituted Attorney

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