END USE PLAN: CHROMITE ORE & PYROXENITE
SUKINDA CHROMITE MINE, M/s TATA STEEL LIMITED

END USE OF MINERAL:

This is a mining project producing chromite ore, chrome concentrate and pyroxenite. Presently the medium and high grade chromite minerals are used by the Company for Ferro Chrome alloy production in its in-house facilities at FAP, Bamnipal & TS Alloy Plant, Athagarh and other conversion units in the country. The low grade chromite ore is beneficiated at the Chrome Ore Beneficiation Plant (COBP) situated within the mining lease area to produce chrome concentrate. The pyroxenite ore is used as a flux in the steel plant at Jamshedpur.

The proposed increase in production for both chrome ore and pyroxenite ore is for meeting the raw material requirements of the expanded capacities of the Company's existing plants as well as new Greenfield projects for beneficiation, ferro alloy and steel production as mentioned above.

TATA Steel Limited (TSL) has approved capacity for production of chrome ore, pyroxenite ore and chrome concentrate @ 2.4 million TPA (ROM), 0.5 million TPA (ROM) and 0.65 million TPA, respectively, from its existing mine at Sukinda over a mining lease area of 406 ha.

Chromite is the only source of chromium which is used widely in metallurgical, chemical and refractory industries. The specification of chrome ore for various industries is tabulated as follows:

Sl. No.	Parameters	Beneficiation	Ferrochrome	Charge	Refractory	Chemical
1	Cr_2O_3	>10%<42%	48% (min)	44%(min)	40%(min)	44% (min)
2	Cr : Fe		2.8:1 (min)	1.6 : 1(min)	---	
3	FeO		---	---	20%(max)	20%
4	CaO		---	---	1%(max)	3% (max)
5	MgO		---	---	---	14%
6	Al_2O_3		---	---	14%(max)	14%
7	SiO_2		---	---	< 10%	7% (max)

NEED OF THE PROJECT:

Sukinda valley in Jajpur district, Odisha is well known for chromite ore deposits. About 97% of Chromite ore reserves of our country occur in the Sukinda valley, covering an area of approximately 200 Sq. km in the Jajpur district. Chromite is the only source of chromium which is widely used in metallurgical, refractory and in chemical industry. More than 80% of the chrome ore mined in our country and in the world is utilized for the downstream metallurgical processes of ferro chrome/ charge chrome production which in turn is utilized for the production of various grades and types of steel.

Sukinda chromite mine is one of the largest chrome ore mines of our country. It is also the only chrome ore mine being operated by the Company. All the ferro chrome producing units of Tata Steel like ferro alloy plant, Bamnipal, TS alloys, Gopalpur and other conversion plants need the high and medium grade chrome ore for producing ferro chrome. The in-house ore requirements are set to grow at a very high rate due to various green and brown field expansion projects undertaken by Tata Steel. Based on the above growth plans, the requirement of chrome ore (ROM) from the Sukinda Chromite mine is set to grow to 2.4 million tonnes/annum.

Adjacent to the chrome ore occurrence, pyroxenite & serpentinite is also found to be occurring within the mining lease. These pyroxenite and serpentinite rocks essentially consist of magnesium silicate minerals. Essentially this forms a part of the overburden being excavated in the course of mining of the chrome ore. The Company by virtue of its in-house R&D efforts has established the use of this pyroxenite ore as a flux mineral in the iron and steel manufacturing process.

Besides meeting the Company's requirement of its own downstream beneficiation, ferro chrome & steel plants as well as conversion agents, the mining and processing of both these minerals (chrome and pyroxenite) is vital for the development of our country at large.

The year-wise use of mineral expected on yearly basis is given in Table-1 below. The forecast given may change as the mine is catering to a number of industries and is dependent on the market conditions which changes very often within very short intervals of time. As shown in the table the requirement of chrome ore is expected to remain close to ~2.4 MTPA of Chrome Ore (ROM).

Presently the pyroxenite quarry is temporarily being utilized for storage of tailing. The shortfall in requirement of flux mineral for the company is being partially met from purchased pyroxenite ore from the Hata, Chaibasa region and the balance as dolomite ore from the existing Gomardih Dolomite quarry operated by the company in Sundergarh district of Odisha. It has been planned to rehandle the tailing from the pyroxenite quarry and do pyroxenite mining in future.

Table- 1
Requirement of Chrome ore (All figures in '000 MT)

Item	UoM	Destination	Consumption per Annum ('000 t)
Concentrate	KWMT	Export/ Domestic	550
Ferro Chrome	KT	Baminipal	50
	KT	T S Alloys	55
	KT	Conversion Plants	230
	KT	Gopalpur Plant	55
	KT	**TOTAL (Ferro Chrome)**	**390**
Sale of Chrome Ore	KT	Domestic/ Export	257
Low Grade Ore	KT	COB Plant	1207
Ferro Chrome Grade	KT	Ferro Alloys Plant	936
Total Chrome Ore	**KT**		**2400**

The company since long has also been registered as a primary mining company under para 3 (b) of the Memorandum and Articles of Association. Accordingly, the company besides meeting its own captive requirements had been in the business of sale of chrome ore and concentrates since long both for other domestic consumers as well as export. However, the company over the years has increased its captive consumption manifold and continues to do so by progressively adding and modernising both its downstream plant capacities and port handling facilities. The company has also been doing further value addition of its chrome ore produce through other plants under conversion agreements and also provides other raw material requirements such as coke for the same. Thus, while the company aspires to achieve the future end use of the chrome ore and concentrates it produces from this mine as given above under Table-1, it may under certain very special circumstances - while still remaining within the legal framework and rights, resort to the

sale and export of chrome ore and concentrates of certain quantities due to either prevalent force majeure conditions, unforeseen market forces or technical difficulties; in the interest of business continuity/ sustenance and overall benefit to the economy and country.

REQUIREMENT OF CHROMITE & PYROXENITE ORE:

The Company is presently operating ferro chrome plants at Bamnipal & Athagarh having production capacity of 50,000 TPA and 55,000 TPA respectively. Besides the ferro chrome plant at Gopalpur having production capacity of 55,000 TPA is on verge of completion. The Company has also one Chrome ore beneficiation within the leasehold area having present capacity of 5,50,000 TPA chrome concentrate production. The company has further added ferro chrome capacity which would go upto 2,20,000 TPA through Conversion agreements within and outside the State making the total ferro chrome capacity of 3,90,000 TPA. The details of calculation are as mentioned in the table given below.

Sl No	Particulars	Future Capacity (TPA)	Chrome Ore Requirement (TPA)
1	2	3	4
a	FAP, Bamnipal	50000	120000
b	T S Alloys, Athagarh	55000	132000
c	Gopalpur Plant	55000	132000
d	Conversion Plants	230000	552000
e	Sub Total	390000	936000
f	COB Plant	550000	1207000
g	Sale of Chrome Ore	257000	257000
h	Total Requirement (Tonnes/ Annum)		2400000

With the proposal of use of entire chrome concentrate produced in the COB Plant for ferro chrome making the total Chrome ore (ROM) requirement is calculated to be 2.40 MTPA.

Similarly, company proposes to produce Pyroxenite (ROM) @ 0.50 MTPA for its use as flux for steel making at our captive Steel plants at Jamshedpur and Kalinganagar.

For TATA STEEL LTD.
By their Constituted Attorney

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