F. No. J-11015/351/2006-IA.II(M)
Government of India
Ministry of Environment, Forest and Climate Change
Impact Assessment Division
***

3rd Floor, Vayu Wing,
Indira Paryavaran Bhavan,
Jor Bagh Road, Aliganj,
New Delhi-110 003

Dated: 28th April, 2023

To,

M/s Steel Authority of India Limited (SAIL),
The Chief General Manager (Mines),
Barsua-Taldih Iron Mines SAIL- Raw Materials Division,
PO- Tensa, Sundargarh- 770 042, Odisha.

Subject: - Barsua-Taldih-Kalta Iron mines of M/s SAIL for expansion in production from 8.05 MTPA to 16.0 MTPA (ROM), Topsoil/OB/IB: 3.92 MTPA and handling 2.0 MTPA Sub-grade dumps/Tailings (Total excavation: 22.0 MTPA) and installation of new Dry Processing Plants of 7.0 MTPA for Taldih & 4 MTPA for Kalta and augmentation of existing 3.5 MTPA Barsua Beneficiation Plant along with adequate loading, siding and associated infrastructure in the amalgamated mine lease area of 2558.581 ha [FC available 2419.871 ha + non-forest land 138.710 ha] out of 2564.323 ha, located at Tantra & Bahamba Villages and Toda RF under Koira Tehsil, Sundargarh District, Odisha - Environmental Clearance (Expansion) regarding

Sir,

This has reference to the online proposal no. IA/OR/MIN/291173/2021 of M/s SAIL for expansion of Barsua-Taldih-Kalta Iron mines from 8.05 MTPA to 16.0 MTPA (ROM), Topsoil/OB/IB: 3.92 MTPA and handling 2.0 MTPA Sub-grade dumps/Tailings (Total excavation: 22.0 MTPA) and installation of new Dry Processing Plants of 7.0 MTPA for Taldih& 4.0 MTPA for Kalta and augmentation of existing 3.5 MTPA Barsua Beneficiation Plant along with adequate loading, siding and associated infrastructure in the amalgamated mine lease area of 2558.581 ha [FC available 2419.871 ha + non-forest land 138.710 ha] out of 2564.323 ha, located at Tantra & Bahamba Villages and Toda RF under Koira Tehsil, Sundargarh District, Odisha.

2. The details of the project as ascertained from the document submitted by the Project Proponent and as revealed from the discussions held during the meeting are given as under:-

i. The amalgamated mine lease area falls under the Survey of India Toposheet No: 73G/1 (F45N1) and bounded by Latitude from 21°49'25.43880"N to 21°59'50.88516"N and Longitude from 85°07'43.73832"E to 85°13'53.48136"E and falls in Seismic Zone-II.

ii. The proposed project activity is listed at schedule no. 1(a) Mining of Minerals and 2(b) Mineral beneficiation and falls under Category "A" of the schedule of the EIA

Notification, 2006 and appraised at the Central level. PP submitted that Odisha-Jharkhand inter-state boundary is located at a distance of ~0.3 km, N from the mine lease area.

iii. The proposal was earlier considered in the 4th EAC (Non-Coal Mining) meeting held during 28-29 September, 2022 wherein the EAC deferred the proposal. The Project Proponent submitted the information on 29.11.2022 in Parivesh portal and accordingly the proposal was reconsidered in the 8th EAC (Non-Coal Mining) meeting held during 27th-28th December, 2022.

iv. The Project Proponent submitted that Environmental Clearances has been obtained in the following chronological order: -

a. Initially, Integrated Environmental Clearance was obtained vide letter No. J-11015/351/2006-IA.II(M) dated 29.10.2010 for Barsua-Taldih-Kalta Iron Ore Mining (ML-130), Beneficiation and Pelletisation plant project of M/s Steel Authority of India Limited for an annual production capacity of 8.05 million tonnes of iron ore by the opencast mechanized method along with setting up of a beneficiation plant of 4.25 million TPA (in additional to existing plant of 2.5 million TPA) and setting up of a pelletisation plant of 2.0 million TPA capacity involving total mine lease area of 2486.391 ha.

b. Thereafter, PP obtained the amendment in Environmental Clearance vide F.No.J-11015/351/2006- IA.II(M) (pt.) dated 30.03.2016 for the following:-

i. Temporary permission to change iron ore production (ROM) from three blocks viz. Barsua, Talidh and Kalta in ML-130 lease from 2.5, 4.25 and 1.3 million TPA to 3.5, 2.05 and 2.5 million TPA respectively, keeping the total iron ore (ROM) production restricted to 8.05 million TPA as specified in the earlier environment Clearance.

ii. Permission to operate existing beneficiation plant at the rate 4.5 million TPA instead of 2.5 million TPA.

iii. Permission for road transportation of part of iron ore (ROM) from Talidh block to the Barsua Valley (about 11kms.) and to the Barsua beneficiation plant for a period of five years till facilities viz. crushing plant, LDBC are erected and commissioned for the Taldih block.

iv. 'To replace outside mine lease area' with 'ML-162 lease and acquired area' in environmental clearance, in order to utilize the infrastructure facilities for processing of iron ore produced from ML-130 lease.

v. To modify the total lease area of ML-130 lease from 2486.391 to 2486.383 ha as per the joint survey committee report (DGPS survey report) of Govt. of Odisha and the lease deed executed by and between the Govt. of Odisha and SAIL on 13thNovember, 2014.

The amendment for point no. (i) to (iii) will be only for 5 years.

c. Further, the PP amended the Environmental Clearance vide F.No. J-11015/351/2006-IA.II(M) dated 03.07.2020 for i) Excavation of iron ore from Barsua Block at 3.50 MTPA including a provision of excavation of maximum upto 1 MTPA tailings from the tailings pond of Barsua for selling. The excavated

tailings will be transported through internal road over 2.1 km to the stacking yard and then to Barsua Public Siding by public road over 0.6 km or any other nearby railway sidings, ii) Excavation of iron ore from Taldih&Kalta Blocks at 2.05 MTPA and 2.50 MTPA respectively including provision of excavation and dispatch of sub-grade iron ore fines maximum upto 0.5 MTPA from Fines Stocks from each block for selling. The excavated sub-grade iron ore fines will be dispatched by road / road & rail and iii) Continuation of the already amended provisions of EC amendment dated 30.03.2016 (valid up to 30.03.2021) for further two years i.e. up to 31.03.2023, which are (i) Permission to change iron ore production (ROM) from three blocks viz. Barsua, Taldih and Kalta in ML-130 lease from 2.5, 4.25 and 1.3 MTPA to 3.5, 2.05 and 2.5 MTPA respectively, keeping the total iron ore (ROM) excavation restricted to 8.05 MTPA as specified in the earlier environmental clearance, ii) Permission to operate existing beneficiation plant at the rate of 4.5 MTPA instead of 2.5 MTPA), subject to the following conditions (Sl. No 22 A), in addition to the conditions prescribed in the EC and subsequent amendments.

d. Subsequently, the PP amended the Environmental Clearance vide F.No. J-11015/351/2006-IA.II(M) dated 03.07.2020 with corrigendum dated 13.07.2020 that the entire 2.05 MTPA iron ore excavated at Taldih will be trucked directly to Barsua Private/Public Sidings till construction of road from Taldih to Barsua Beneficiation Plant.

e. Again, PP amended the Environmental Clearance vide F.No. J-11015/351/2006-IA.II(M) dated 17.03.2021 for re-distribution as (i) increase in iron ore production from Kalta Block by 0.7 MTPA from 2.5 MTPA and the final capacity is 3.2 MTPA which also includes maximum of 0.5 MTPA of sub-grade iron ore fines excavated from accumulated stocks and (ii) reduction in iron ore production from Taldih Block by 0.7 MTPA from 2.05 MTPA and the final capacity is 1.35 MTPA which also includes maximum of 0.5 MTPA of sub-grade iron ore fines excavated from accumulated stocks within permitted EC capacity of 8.05 MTPA.

f. Then, PP obtained amendment in Environmental Clearance vide J-11015/351/2006-IA.II(M) dated 25.01.2022 for amalgamation of contiguous mine lease areas comprising of ML-130 (2486.383ha) and ML-162 (77.94ha) as total area of 2558.581 ha [FC available 2419.871 ha + non-forest land 138.710 ha] without change in production capacity [8.05 MTPA ROM and Beneficiation Plant Capacity 3.5 MTPA].

v. The project was granted Terms of Reference (ToR) by the Ministry vide its letter dated 22.03.2022 based on the recommendation of sectoral EAC meeting held during 15th - 17thFebruary, 2022.

vi. The Project Proponent submitted that the Barsua Iron mine (Southern part) and Kalta Iron mine (Northern part) are in operation since 1960 and 1966 respectively. The Taldih Iron mine (Middle part) has started production in the year 2016.There were two contiguous mining leases namely ML–130 (main iron ore mining lease) and ML -162 (for infrastructure) under the Barsua – Taldih-Kalta Iron Mines. The mining lease for ML- 130 (2486.383 ha)was granted on 06.01.1960 for a period of 30 years and

subsequently it has renewed & lease deed for the 2nd renewal period has been executed on 13.11.2014 having validity up to 05.01.2030.The associated infrastructure facilities of Barsua Iron Mine are located in another adjoining mining lease viz ML - 162 (77.94 ha), which was granted on 29.04.1960 and subsequently it has also been renewed as well as extended the lease period up to 28.04.2030 and supplementary lease deed was executed on 24.09.2016. Based on the SAIL's application, Dept. of Steel and Mines, Govt. of Odisha vide proceeding No. IV(B)SM-03/2020/10418/SM, Bhubaneswar, dated 02.12.2020 amalgamated the contiguous mining leases viz ML - 130 (2486.383 ha) and ML - 162 (77.94 ha) covering total area of 2564.323 ha having validity up to 05.01.2030. Lease deed of the amalgamated lease has been executed on 30.03.2021.

vii. Land use/Land Cover of the Mine Lease Area:

Particulars	Area	Remarks
Forest Land	2425.613 ha	Total Forest Land for which Stage-II FC is available is 2419.871 ha
Private land	24.014 ha	Non-Forest Land
Government land	114.696 ha	
Schedule Tribe & Other Traditional Forest Dwellers	5.742 ha	
Total mine lease area	2564.323 ha	

viii. Mining plan details:

Modification of Mining Plan along with Progressive Mine Closure Plan approved by Indian Bureau of Mines (IBM)	Letter No.	MP/A/39-ORI/BHU/2020-21
	Date	01.04.2021
	Mineral	Iron Ore
	Area	amalgamated mine lease area of 2564.323 ha
	Validity	2020-21 to 2024-25
Mining Parameters	Quantitative Description	
Method of Mining	Opencast mining with deep hole drilling and blasting and excavation and haulage through shovel dumper combination.	
Mineable Reserve	Barsua Block: 130.72 MT Taldih Block: 328.26 MT Kalta Block: 96.01 MT	
Drilling/Blasting	Barsua Block: DTH drill of 150m dia/Slurry Explosive Taldih Block: DTH drill of 150m dia/Slurry Explosive Kalta Block: DTH drill of 100m dia/Slurry Explosive	
Bench Height	Barsua Block: 10 m Taldih Block: 12 m Kalta Block: 6 m	
Bench Width	Barsua Block: 20 m Taldih Block: 20 m Kalta Block: 10 m	
Individual bench slope	80°	
Overall pit slope	37°	
Life of mine	Barsua Block: 33 Years Taldih Block: 43 Years Kalta Block: 24 Years	

Transportation details	Barsua Block: Belt conveyer to Barsua railway siding Taldih Block: Long distance conveyor to Barsua Railway Siding Kalta Block: Long distance conveyor to Roxy Railway Siding
Dumpers capacity	Barsua Block: 50/60/100T Taldih Block: 25/35/100T Kalta Block: 25/35T
RoM output size	150 mm
Throughput Capacity of Processing Plants	Barsua Block: 3.5 MTPA Taldih Block: 7.0 MTPA Kalta Block: 4.0 MTPA
Waste Dump Management	PP submitted that Waste/ overburden/ sub-grade materials will be hauled to designated dump yards as planned in the approved mining plan. The waste materials will be utilized for back-filling of ultimate pit voids. During the conceptual stage there will be no external OB dumps. All external OB dumps will be rehandled and backfilled in the minedout pits during the final closure.
Conveyor Belt	The Project Proponent submitted that it is proposed to construct an overland Long-Distance Belt Conveyor (LDBC) directly from Kalta Mines to Roxy Railway Siding to transport sized iron ore from the mine to the railway siding. The LDBC shall replace the existing system of road transport through NH-520. The proposed conveyor route is about 16 km long; whereas the existing evacuation of ore by road (NH-520) is about 18 km long. Out of 16 km length of the LDBC, ~2 km will be within the ML and ~14 km will be outside the ML parallel to NH–520. The gallery of the LDBC will be located at a height of 12m above the ground profile of the alignment with minimum trestles for free movement of animals in the forest. PP submitted that it is expected to take about 3 years for installation and commissioning of the proposed Long Distance Belt Conveyor from Kalta to Roxy Siding for evacuation of the iron ore. It is proposed that during construction phase or till the stabilisation of new proposed LDBC system, Kalta Iron Mine will continue to dispatch lump and fines through dump trucks to Roxy Railway Siding at 4 MTPA. The Project Proponent submitted that based on the suggestion of the Hon'ble EAC, feasibility of laying conveyor from Kalta to Barsua Rly Siding through Taldih within ML for evacuation of iron ore from Kalta Iron Mine has been studied in detail and is not be feasible.
Handling of rejects from tailing pond and recycling of wastewater after treatment	The Project Proponent submitted that the tailings generated from the Barsua Beneficiation Plant are stored in the Tailings Pond at Barsua Valley over an

	area of 35.88 ha, out of which 3.95 ha is located within the amalgamated mine lease area and the balance 31.93 ha is located outside the lease area in land acquired by SAIL adjacent to amalgamated lease. PP also submitted that the tailings pond has been designed to store about 5 million tonnes of tailings. The tailing pond has a dyke wall constructed by stone pitching on three sides and fourth side being the lowest contour of the hill range. As on FY: 2019-20, about 4.15 Million Tonnes stored in the pond. Further, PP submitted that the Ministry of Mines, GoI order dated 19.09.2019 allowed sale of sub-grade iron ore lying at captive mines of SAIL and subsequently, Govt. of Odisha vide order dtd. 02.12.2019 allowed sale of dump fines / tailings from SAIL Mines in Odisha.Sale of tailings from Barsua tailings Pond has been started since October' 2020 and so far about 1 million tonnesold in open marketand dispatched about 0.9 million tonne of tailings in the open market. PP submitted that after the proposed modifications at existing Barsua Beneficiation Plant, the rejects generated from the Jigging Plant and Classifiers will be further ground and processed through WHIMs and other beneficiation equipment. Due to this modification, at one hand, recovery of iron ore will increase and generation of tailings will decrease, on the other hand, plant will be able to take feed of low grade iron ore. It is expected that about 50% of the ROM will be processed through wet circuit plant of which about 60% of the material will be fines which will be processed through fines beneficiation unit. It is expected, that about 20% of the feed to fines will be rejected as tailings. Tentatively, it may be estimated that about 2,40,000 tonne of tailings will be generated annually. PP will continue to sell tailings from Barusa Tailings Pond subject to demand from open market. PP also submitted that the effluent generated from the ore beneficiation plant of Barsua is being treated in thickeners and about 60% of clear water from the thickener is being recycled back to the system. The underflow from thickener is discharged into Tailing Dam for further solid - liquid separation. The overflow from the tailings pond is further collected in the Zero Discharge System and pumped back to the system for recycling.

ix. Water requirement:

Total water requirement	8845 m^3/day	Fresh water	8675 m^3/day
		Treated water	170 m^3/day
Source	KuradihNalla / NajkuraNalla		
Permission	PP submitted that Department of Water Resources, Govt. of Odisha has permitted allocation of 3.406 cusec (~8333 m^3/day) of surface water from KuradihNalla vide Letter no.4897/WR dated 15.02.2021. The permitted drawl quantity from NajkuraNalla is 24,110 m^3/month (~803 m^3/day).		

x. Nearest village / town/ highway/railway station / water bodies:

Particulars	Particular's Name	Distance & Direction
Village	Tantara	Within mine lease
Town	Koira	10 km
Highway	NH - 520	Passing through mine lease
Railway Station	Barsua	1 km
Water bodies	SamajNalla KurarhiNala Karo River	Passing through mine lease 0.1 km 3.0 km

xi. The Project Proponent submitted that total mine lease area is 2564.323 ha, out of which 2425.613 ha is Forest Land (Toda R.F.) and 138.710 ha is Non-Forest Land. PP submitted that 5.742 ha of Forest Land, which was part of ML – 130, is under occupation of the local Schedule Tribe & Other Traditional Forest Dwellers in Village Tantra. Their individual rights have been recognized by granting pattas under Forest Right Act., 2006. PP obtained Stage-II Forest Clearance vide MoEF F.No.8-90/1996-FC (pt), dated 06.03.2013 for diversion of forest land over 2341.931ha (2248.252 ha for mining and allied activities and 93.679ha for safety zone) under ML – 130 of BarsuaTaldih-Kalta in favour of M/s SAIL. Then, PP obtained Stage-II Forest Clearance vide MoEF F.No.8-18/2014-FC dated 23.10.2017 for diversion of 77.94 ha of forest land including 2.562 ha of safety zone area for development of mining infrastructure in Toda RF in ML–162 lease of M/s SAIL. Further, PP submitted that Stage – II Forest Clearance over 2419.871 ha obtained covering under the amalgamated lease. Further, PP submitted that there is no National Park, Wild Life Sanctuary, Eco Sensitive Zone, Elephant Reserve/Tiger Reserve, Wildlife Corridors within 10km radius.

xii. The Project Proponent reported that there are six Schedule-I species in the buffer zone such as Indian Elephant, Sloth Bear, Wolf, Peafowl, Leopard, Indian python. In support of this, PP submitted the authenticated list of flora and fauna from the Office of the Divisional Forest Officer, Bonai Division, vide letter dated 06.04.2022. PP also submitted that the Site Specific Wildlife conservation plans (SSWCP) was approved by Chief Wildlife Warden, Odisha vide letter dated 25.02.2013 over an area of 2486.313 ha & 13.01.2016 over an area of 77.94 ha. Further, PP submitted that an amount of Rs.17.82 Crores &Rs. 9.84 Crores were deposited for implementation of approved SSWCPs in buffer zone of Barsua-Taldih-Kalta Iron Mines. Further, PP submitted that as per the guidelines issued by the PPCF (Wildlife) & Chief Wildlife Warden Odisha dated 16.04.2022, concerned DFOs shall prepare the Site Specific Wildlife Conservation Plans. Accordingly, the matter has been discussed with DFO,

Bonai. Vide Memo No. 9673/6F-(Mg.), dated 19.11.2022, DFO, Bonai has clarified that the implementation of SSWCP of ML-130 has started from 2016-17 and implementation of SSWCP of ML-162 is yet to be started. Hence, revision / updation of both the Plans of SAIL's Barsua – Taldih – Kalta Mines shall be done after implementation of the existing plans.The approved interventions of Site Specific Wildlife Conservation Plans of both ML – 130 and ML – 162 Mining Leases under the Barsua – Taldih – Kalta Mines are being implemented in the project area in consultation and guidance of DFO, Bonai.

xiii. The Project Proponent submitted that the plantation is being done inside the lease area of Barsua-Taldih-Kalta Mines and nearby areas for creating greenbelt over the period of years. In compliance to the forest clearance condition related to Safety Zone protection, scheme for Safety Zone plantation has been prepared and phase wise plantation within safety zone of mining lease is being done through State Forest Department. Safety Zone plantation of 32,000 saplings over an area of 93.679 ha has been done through State Forest Department. Apart from this, so far 2,25,865 saplings have been planted covering an area of 110.48 ha since 2010. In the year 2020-21, total 13,000 saplings have been planted over an area of 5.50 ha at Barsua and Kalta block. A total of 2408.21 ha will be under green cover at the end of mine life, out of which 150.48 ha is existing/proposed safety zone/greenbelt and 732.064 ha is undisturbed forest areas. The additional plantation will be carried out over 1548.726 ha with 24,52,596 saplings within the Mine lease area. The estimated cost of afforestation within the ML area as per the plan shall be about Rs. 7358 Lakhs as per prevailing rates for plantation of 2022-23.

xiv. Baseline Details:

Period: March, 2021 to May, 2021 (Summer Season)

AAQ parameters at 12 locations

Pollutant	Min, $\mu g/m^3$	Max, $\mu g/m^3$	98 Percentile value	Standard, $\mu g/m^3$
PM10	65.0	110.0	106.0	100
PM2.5	32.0	59.0	55.0	60
SO2	4.0	24.9	24.6	80
NOx	10.0	33.9	33.2	80

The PM_{10} collected during the March-May 2021 was analysed for organic matter content (as pollen grains are organic in nature). The PM_{10} Levels and mean Organic carbon and Organic Matter Content of PM_{10} in % at these four locations are as follows:

Stn.No	Location	PM_{10} Conc. in $\mu g/m^3$ Figures in {} are the Mean Values	Mean Organic Carbon Content of PM_{10} in %	Mean Organic Matter Content of PM_{10} in %
A1	Kalta Mine area	73 – 98 {91}	9.1	15.8
A10	Barsua Mine Office	77 – 95 {88}	13.2	22.8
A4	Jhirpani Village	65 – 89 {78}	20.0	34.6

	A9	Taldihi Village	70 – 91 {82}	18.4	31.9
AAQ modeling	Pollutant	Baseline Concentration, $\mu g/m^3$	Incremental Concentration, $\mu g/m^3$	Total GLC, $\mu g/m^3$	Standard
	PM10	96.0	11.3	107.3	100
	PM2.5	55.0	0.1	55.1	60
	SO2	24.6	-	24.6	80
	NOx	33.0	-	33.0	80
Noise level at 10 locations	Day Time: 40.3 to 68.9 Leq dB (A) Night Time: 38.7 to 55.6Leq dB (A)				
Ground water quality at 8 locations	PP reported that nitrate concentrations are found to be below detection limits in all the ground water monitoring samples except in GW1 and GW8. The concentration of Total hardness (as$CaCO_3$) varied from 84 to 160 mg/l in eight ground water samples which is well within the "Acceptable Limits". Slightly high turbidity was found in locations as per the following order: GW2 > GW7 > GW6; however, within the "Permissible Limits".				
Surface water quality at 8locations	PP reported that pH of water samples is in the range of 7.02 to7.39which are well within 6.5-8.5. The Dissolved Oxygen varied from 4.4 to 6.9 mg/l. The Fe concentration with 0.598 mg/l is high in SW1 (Tailing Pond discharge water (Outlet) (BIM)when compared with other surface water samples. The Fe concentrations are found to below in upstream when compared with downstream samples. The concentrations of total alkalinity (as CaCO3), in eight surface water samples ranged from 20 to 56 mg/l and the Total hardness (as $CaCO_3$) concentrations varied from 20 to 48mg/l. Hence the water samples can be categorised as soft water due to low degrees of hardness. Total Coliform results of SW1, SW3, SW7 & SW8 samples are above 500 MPN/100 ml which makes this surface water quality fall under Class C i.e. surface water which can be used as drinking water source after conventional treatment and disinfection. The rest of the surface water samples SW2, SW4,SW5 & SW6 is suitable can be used for outdoor bathing (organised) (i.e. Class B) as the Total coliform concentrations are less than 500 MPN/ 100 ml.				
Soil quality at 8 locations	PP reported that the soil pH was observed in the range of 4.62 (Strongly acidic) to 5.81 (Moderately acidic). Electrical conductivity ranged from 19.4 to 141.6 µs/cm. Availability of Nitrogen at all locations ranged from314 kg/ha (Medium) to 941 kg/ha (High), Phosphorus at all locations ranged from 0.45kg/ha (Low) to 1.83 kg/ha (Low) and Potassium at all locations ranged from 0.24 kg/ha(low) to 1.13 kg/ha (High). Organic content varied from 0.78% (dump/OB area) to2.38% (agricultural land). Fe and Mn are found to be generally higher in the region, due to the natural geology of the area. Overall, the level of some micro-nutrients is above the critical limits in the study area. Hence, it is deduced that no external application of micro-nutrients is required (fertilisers) for good plant growth.				
Traffic Survey	PP reported that traffic Density has been studied on the nearby routes at four locations (1). On the public road near Barsua Public Siding (TDS1), (2). Near Tensa Guest House on the Koira to Barsua Valley public road (TDS2), (3) On the Koira to Barsua Valley public road just beyond Taldih Mine towards Barsua Valley (TDS3) and (4). On NH-520 at Toda Village at Toda (between Kalta Mines gate & Roxy siding)				

	(TDS4). Traffic density has been monitored every hour continuously for seven days during the monitoring period. TheTensa-Barsua Road (TDS 2 & TDS 3) is a Two-lane road in Rolling Terrain with surfaced shoulders of at least 1.5 m on either side (i.e. capacity – 12,650 PCUs/day as per IRC:64-1990). The road near Barsua Siding (TDS1) is also a two-lane road but on "Plain Terrain" (i.e. capacity – 15000 PCUs/day as per IRC:64-1990). The Kalta– RoxySiding Road (NH-520) is a "four-lane Highway in plain terrain" (i.e. capacity – 40000PCUs/day as per IRC-SP:084-2014). At present the traffic volumes at TDS1, TDS2, TDS3and TDS4 are within the respective recommended Design Service Volumes.

xv. Public Hearing (PH) Details:

Advertisement for PH with date	i. National English Daily: "Sunday Times" Bhubaneshwar edition dated 22-05-2022, ii. Odiya Daily: "The Sambad" dated 20-05-2022
Date of PH	23.06.2022
Venue	Ispat High School Playground of Tensa Village under Koira Block, Sundargarh District, Odisha
Chaired by	Shri Shiv Shankar Toppo, Additional District Magistrate, Sundargarh
Main issues raised during PH	Protection of natural resources, plantation, health camp, development of Anganwadi, employment of locals in the mine, protection of environment, protection of perennial nallahs, water sprinkling on road, noise pollution, desilting of nallahs, improved in drinking water supply, improvement in social infrastructure, school bus, improvement in education facilities, improvement in medical facilities, pollution control, promotion of sports especially hockey, support to Self Help Groups in peripheral villages, skill development, improvement in sanitation facilities, improvement in roads
Budget proposed for addressing issues raised during PH	Rs. 21.88 crores over the next three years
Additional information (if any)	The Project Proponent submitted an undertaking vide letter dated 29.11.2022 stating that *"the activities proposed under public hearing action and Corporate Social Responsibilities will not be similar"*

xvi. The Project Proponent submitted the Consent to Operate issued by the Odisha State Pollution Control Board vide Consent Order Letter No. 4882/IND-I-CON-1(A), dated 28.03.2022 for production of 8.05 MTPA (ROM) [(i) Barsua – 3.5 MTPA iron ore including excavation and dispatch of tailings maximum up to 1.0 MTPA from the tailing pond at Barsua, (ii) Kalta – 3.2 MTPA iron ore including excavation and dispatch of subgrade iron ore fines maximum up to 0.5 MTPA from fines stocks and (iii) Taldih – 1.35 MTPA iron ore including excavation and dispatch of subgrade iron ore fines maximum up to 0.5 MTPA from fines stocks] and operation of mobile crushing and screening plant of capacity 4x300 TPH and operation of mobile screening plant of capacity 4x300 TPH for the period up to 31.03.2023. PP submitted the Certified EC Compliance report issued by the Integrated Regional Office (IRO)

Bhubaneswar vide Lr No. 101-257/21/EPE/1353 dated 29.10.2021. Site visit was carried out by IRO, Bhubaneswar on 22nd& 23rdOctober, 2021. The Project Proponent also submitted the Certified Compliance Report (CCR) issued by the Integrated Regional Office, Bhubaneswar vide File.No: 101-257/21/EPE dated 28.11.2022 for the following (i). Examination of the verification report for the status of compliance of measures suggested in the CCR vide letter dated 01.11.2021, (ii). Amendment in EC dated 30.03.2016, (iii). Amendment in EC dated 03.07.2020, (iv). Amendment in EC dated 17.03.2021, (v). EC dated 25.01.2022 and Compliance to conditions of Recommendations of CSIR-NEERI report on "Carrying capacity study for environmentally sustainable Iron and Manganese Ore mining activity in Keonjhar, Sundargarh and Mayurbhanj districts of Odisha State. The project was monitored on 09.11.2022 and 10.11.2022.

xvii. The Project Proponent submitted the year wise production data of ML-130 (2486.383 Ha) from 1993-94 to 2018-19 certified by Deputy Director of Mines, Koira vide Mem No 6522/Mines, dt 13.12.2019 and for the period 2019-20 to 2020-21 certified by Deputy Director of Mines, Koira vide Mem No 4004/Mines, dt 22.10.2021. PP reported that subsequent to the judgment of Apex Court dated 02.08.2017, the Government of Odisha has issued demand notice to BarsuaKalta Mines for payment of compensation towards excess production on or before 31st December, 2017 against EC/CTO capacity. Dy. Director of Mines (DDM), Koira vide letter dated 02.09.2017 issued a demand notice for payment of Rs. 66,89,42,779.5 /- in respect of Barsua / Kalta Iron Mines to recover price of mineral produced without/beyond EC alone under Section 21 (5) of MMDR Act, 1957. The said amount was deposited on 29.12.2017 under protest. Further, letter No.5962/Mines dtd, 24.10.2017 of DDM, Koira has directed to pay compensation of Rs.90,19,71,684.40 /- for mining in excess of the permissible limit under the Consent to Operate. Against the above stated demands, SAIL had filed a Writ Petition bearing WP (C) No- 24282/2017 in High Court of Odisha, Cuttack. The matter was heard and Hon'ble High Court had passed the stay order on 04.04.2018 & matter is sub-judice. PP also submitted the copy of the court order date 04.04.2018. PP also submitted the affidavit dated 20.04.2020 that Barsua-Taldih-Kalta Iron Ore Mine (ML-130, Mining Lease: 2486.383 Ha) of SAIL shall comply with all the statutory requirement & judgment of Hon'ble Supreme Court dated 2nd August 2017 in writ Petition (civil) No. 114 of 2014 in the matter of common cause versus Union of India &Ors subject to the result of the pending writ petitions before Hon'ble High Court of Odisha and further appeals thereto if need arises.

xviii. The Project Proponent submitted that no R&R plan is required as no displacement of people is proposed for the expansion of Barsua-Taldih-Kalta Iron Ore Mining Project.

xix. Details of the Environment Management Plan (EMP):

Activities	Capital cost (Rs. in Crores)	Recurring cost (Rs in Lakhs/annum)
POLLUTION CONTROL		
A. Water Pollution Control	16.00	190
B. Air Pollution Control	20.95	491
C. Solid Waste Management	0.55	40
OCCUPATIONAL SAFETY & HEALTH	0.30	15

GREEN BELT DEVELOPMENT	73.58	0
WILDLIFE CONSERVATION & MANAGEMENT	0.00	142
POLLUTION MONITORING	0.00	40
RAINWATER HARVESTING	0.50	5
Cost for Environmental Protection Measures (in Rs. Lakhs)	111.88	923

xx. Details of project cost and employment:

Particulars	(Rs. In Crore)
Capital Cost for Environment Protection	Rs.111.88 Crores
Budget for addressing the Public Hearing issues	Rs.21.88 Crores over the next 3 years (including 13.27 Crores of cost of Environmental Protection)
Total Cost for EMP	Rs.120.49 Crores (Including PH issues)
Recurring Cost for EMP	Rs. 9.23 Crores per year
Project Cost	Rs. 2740.88 Crores
Employment	1133 nos. additional

3. Observation and Recommendation of the Committee:

The EAC deliberated on the additional details submitted by the Project Proponent and the Consultant. The Project Proponent informed the EAC that the proposed conveyor route is about 16 km long, out of which ~2 km will be within the ML and ~14 km will be outside the ML parallel to NH–520. The EAC asked about the status of the conveyor belt. The Project Proponent informed the EAC that the construction of conveyor is still not commenced and it will take three years to commence. The proposal for diversion of forest clearance will be submitted after obtaining the EC. Barsua-Taldih-Kalta ML area is ~18 km long in N-S direction. E-W width narrow is ~800 m to ~1500 m. In order to transport iron ore from Kalta through Taldih, the belt conveyor route has to pass through Taldih-D, Taldih-B, Taldih-C Blocks from N to S and cross the NH – 520 near Kalta Mine. The limited space is available between ultimate pit boundary and lease boundary earmarked for green belt and safety zone. i.e. there is no space for construction of corridor of conveyor belt line through this area. The EAC opined that the Project Proponent shall install the noiseless conveyor. PP also informed the EAC that the NOC for approach from Kalta Mine to NH–520 from National Highways Authority of India (NHAI), Rourkela has been taken up and the same will be completed by Sept. '2023.

The Project Proponent informed the EAC that the DFO, Bonai vide Memo No. 9673/6F-(Mg.), dated 19.11.2022 has clarified that the implementation of Site Specific Wildlife Conservation Plan (SSWCP) of ML-130 has been started from the year 2016-17 and implementation of SSWCP of ML-162 is yet to be started. Hence, revision /updation of both the plans shall be done after implementation of the existing plans. Effluent generated from the ore beneficiation plant is being treated in Thickeners and about 60% of clear water from the thickener is being recycled back to the system. The underflow from thickener is discharged into Tailing Dam for further solid - liquid separation. The overflow from the

tailings pond is further collected in the Zero Discharge System and pumped back to the system for recycling.

Further, the Project Proponent informed the EAC that the action taken report submitted on 17.12.2022 for the non-compliances identified by Integrated Regional Office (IRO). The EAC asked about the status of the court case. The Project Proponent informed the EAC that the Dy. Director of Mines (DDM), Koira vide letter No.5962/Mines dtd 24.10.2017 has directed to pay compensation of Rs. 90,19, 71,684.40/- for mining in excess of the permissible limit under the Consent to Operate. Against the above stated demands, the Project Proponent had filed a Writ Petition bearing WP (C) No- 24282/2017 in High Court of Odisha, Cuttack. The matter was heard, and Hon'ble High Court vide order dated 04.04.2018 had passed the stay order on demand dated 24.10.2017 & the matter is sub-judice. SAIL vide undertaking dated 21.04.2023 mentioned that the SAIL will abide by the decision of the Hon'ble Courts of law in the matter of demand issued by DDM, Koira dated 24.10.2017".

After detailed deliberations made by the Project Proponent and the Consultant, the EAC (Non-Coal Mining) **recommended** the proposal in its EAC meeting held during 27-28 December, 2022, 17-18 January 2023 and 17 April, 2023 under the provisions of EIA Notification, 2006 for grant of Environmental Clearance (EC) for Barsua-TaldihKalta Iron mines of M/s SAIL for expansion in production from 8.05 MTPA to 16.0 MTPA (ROM), Topsoil/OB/IB: 3.92 MTPA and handling 2.0 MTPA Sub-grade dumps/Tailings (Total excavation: 22.0 MTPA) and installation of new Dry Processing Plants of 7.0 MTPA for Taldih& 4 MTPA for Kalta and augmentation of existing 3.5 MTPA Barsua Beneficiation Plant along with adequate loading, siding and associated infrastructure in the amalgamated mine lease area of 2558.581 ha [FC available 2419.871 ha + non-forest land 138.710 ha] out of 2564.323 ha, located at Tantra & Bahamba Villages and Toda RF under Koira Tehsil, Sundargarh District, Odisha subject to the specific conditions in addition to the standard EC conditions applicable for non-coal mining projects.

4. The matter was examined in the EAC in accordance with the Environmental Impact Assessment Notification, 2006 and further amendments thereto and the undersigned is directed to say that the Ministry of Environment Forest & Climate Change after accepting the recommendation of EAC during its EAC (Non-Coal Mining) meeting held during 27th - 28th December, 2022, 17-18 January 2023 and 17 April, 2023 hereby accords Environmental Clearance (EC) for Barsua-Taldih-Kalta Iron mines of M/s SAIL for expansion in production from 8.05 MTPA to 16.0 MTPA (ROM), Topsoil/OB/IB: 3.92 MTPA and handling 2.0 MTPA Sub-grade dumps/Tailings (Total excavation: 22.0 MTPA) and installation of new Dry Processing Plants of 7.0 MTPA for Taldih & 4 MTPA for Kalta and augmentation of existing 3.5 MTPA Barsua Beneficiation Plant along with adequate loading, siding and associated infrastructure in the amalgamated mine lease area of 2558.581 ha [FC available 2419.871 ha + non-forest land 138.710 ha] out of 2564.323 ha, located at Tantra & Bahamba Villages and Toda RF under Koira Tehsil, Sundargarh District, Odisha subject to compliance of the terms & conditions and the environmental safeguards mentioned below:-

A. SPECIFIC CONDITIONS

i. This EC will be subject to the outcome of the Writ Petition (C) No- 24282/2017 in the Hon'ble High Court of Odisha, Cuttack.

ii. The Environmental Clearance (EC) is accorded for the reduced area of 2558.581 Ha [FC available 2419.871 ha + non-forest land 138.710 ha] out of 2564.323 ha.

iii. No mining activity shall be carried out over an area of 5.742 ha (Schedule Tribe & Other Traditional Forest Dwellers).

iv. The Project Proponent shall commence the operation of the conveyor belt within 2 years from the date of issue of this EC, till the conveyor belt is implemented, SPCB shall grant CTO upto 12 MTPA Only (consisting of 4 MTPA from Barsua, 2 MTPA from Taldih and 4 MTPA from Kalta and 2 MTPA subgrade/tailings). After the operational of conveyor belt, SPCB may grant CTO upto 16 MTPA [(4 MTPA from Barsua, 8 MTPA from Taldih and 4 MTPA from Kalta) and 2 MTPA subgrade / tailings] based on site inspection of compliance of this conditions.

v. PP shall obtain NOC from Department of Steel and Mines, Odisha for extension of timeline to implement condition conveyor belt for transportation of minerals beyond the stipulated timeline as per guidelines/recommendation of NEERI.

vi. The Project Proponent shall submit a progress report of implementation of the conveyor belt in compliance report of EC vide six monthly report to the Integrated Regional Office (IRO)/Ministry.

vii. The Project Proponent shall install the noiseless conveyor. Installation of the conveyor should be completed within two years after obtaining forest clearance of the proposed conveyor route.

viii. The Project Proponent shall undertake the stringent air pollution measures to control the air pollution in the vicinity of the mine lease area and the efforts made and the outcome shall be submitted to the Ministry's Integrated Regional Office. The Project Proponent shall ensure that the concentration of the air pollutants does not exceed the prescribed National Ambient Air Quality Standards (NAAQS).

ix. The Project Proponent should follow-up the status of implementation on Site Specific Wildlife Conservation Plan from the Forest Officials and the same shall be submitted to the Ministry's Integrated Regional Office in the six monthly compliance report.

x. The Project Proponent shall effectively utilize the low grade Iron ore.

xi. The Project Proponent needs to utilize the mine waste water having high concentration of Fe content for different commercial applications in industries such as cosmetics, pharmaceutical, paint industry.

xii. The Project Proponent needs to complete the work of the concrete road from Kalta mine to NH-520 by September, 2023. No village road shall be used for transportation of minerals.

xiii. The Project Proponent shall pay to farmers of agricultural land if there is any loss due to pollution found by concerned District Commissioner as per extent rules or norms.

xiv. The Project Proponent shall take adequate measures to prevent the pilferage of mineral.

xv. The surface water quality from upstream and downstream are to be regularly monitored.

xvi. The Project Proponent needs to maintain zero discharge and garland drains, settling ponds needs to be properly designed. Stone pitching shall be made at suitable places to regulate water flow.

xvii. The Project Proponent shall carry out the vacuum cleaning all along the mineral transportation route.

xviii. The Project Proponent needs to facilitate the online education system in the schools by providing Wi-Fi connectivity, smart classrooms and desktops/ tablets.

xix. The Project Proponent shall take adequate measures to protect the perennial nallas.

xx. The Project Proponent needs to install the permanent water sprinklers along the haul road and the approach road. Further, 10 nos. of fog canon/mist sprayer of atleast 40 m throw shall be installed at various locations in the mine area.

xxi. The Project Proponent shall explore the possibility of using atleast 20% of electric vehicles/LNG/CNG instead of diesel operation within three years from the start of mining operations.

xxii. The budget of Rs. 21.88 Cr to address the concerns raised by the public including in the public hearing to be completed within 3 years from the date of start of mining operations. PP shall comply with all action plans made for public hearing concerns and make regular maintenance and record the progressive activity outcomes.

xxiii. The Project Proponent should adopt the proper mitigation measures as proposed under EMP with budgetary provision of Rs.111.88 Crores. The adoption of mitigation measures and monitoring of the same as proposed in the EMP shall be done under the supervision of the qualified environmental personnel. The implementation status of the same shall be submitted to the Ministry's Integrated Regional Office.

xxiv. The Project Proponent should establish in house (at project site) environment laboratory for measurement of environment parameter with respect to air quality and

water (surface and ground). A dedicated team to oversee environment management shall be setup at site which should comprise of Environment Engineers, Laboratory chemist and staff for monitoring of air, water quality parameters on routine basis instead of engaging environment monitoring laboratories/consultants. Any non-compliance or infringement should be reported to the concerned authority.

xxv. The Project Proponent shall also organize employment-based apprenticeship/ internship training program every year with appropriate stipend for the youth and other programs to enhance the skill of the local people. The data should be maintained for the training imparted to the persons and the outcome of the training, for the assessment of the training program should be analyzed periodically and improved accordingly.

xxvi. The Project Proponent shall ensure the survival rate of 95% for planting the gap plantation and new plantation. The Project Proponent shall make the actual count on the saplings planted and its survival rate and in case of failure of achievement of 95% survival rate, action plan for achieving the target survival rate shall be submitted to the Ministry's Integrated Regional Office. Project proponent shall use saplings of 10 ft height for plantation.

xxvii. The Project Proponent should periodically monitor and maintain the health records of the mine workers digitally prior to mining operations, at the time of operation of mine and post mining operations. Regular surveillance shall be carried through regular occupational health check-up every year for mine workers. PP shall also organize medical camp for the benefit of the local people and also the monitor the health impacts due to mining activity.

xxviii. The mining lease holders shall, after ceasing mining operations, undertake regrassing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc. The implementation report of the above said condition shall be submitted to the Ministry's Integrated Regional Office.

B. <u>Recommendation of CSIR-NEERI Report on "Carrying Capacity Study for Environmentally Sustainable Iron and Manganese Ore Mining Activity in Keonjhar, Sundargarh and Mayurbhanj districts of Odisha State</u>: The Committee has also deliberated the various specific recommendations of carrying capacity study report conducted by CSIR-NEERI w.r.t. mining proposal of Iron Ore and/or manganese in the State of Odisha. There are recommendations which needs to be implemented by the State Govt. of Odisha and Project Proponent. Based on detailed deliberations on the recommendations of the carrying capacity study report, the Committee has also **recommended the following specific conditions *viz.***

1) Project Proponent and Department of Steel & Mines, Govt. of Odisha shall ensure the implementation of recommendations of carrying capacity study report conducted by

CSIR-NEERI w.r.t. mining proposal of Iron Ore and/or manganese in the State of Odisha.

2) Department of Steel & Mines, Govt. of Odisha should prepare 5 years regional plan for annual iron ore requirement from the state, which in turn shall be met from different mines/zones (e.g. Joda, Koira.) in the state. Accordingly, sustainable annual production (SAP) for each zone/mine may be followed adopting necessary environmental protection measures.

3) Project Proponent shall construct the cement concrete road from mine entrance and exit to the main road with proper drainage system and green belt development along the roads and also construction of road with minimum 300 m inside the mine. This should be done within one year for existing mines and new mine should have since beginning. The Department of Steel & Mines, Govt. of Odisha should ensure the compliance and should not issue the Mining Permits, if mine lease holder has not constructed proper cement concrete road as suggested. **This Environmental Clearance for the expansion project shall be operated only after the compliance of the above mentioned specific condition.**

4) The Committee observed that as per the recommendations of NEERI report the PP needs to do regular vacuum cleaning of all mineral carrying roads aiming at "zero dust re-suspension" within 3 months. **This Environmental Clearance for the expansion project shall be operated only after the compliance of the above mentioned specific condition.**

5) Project Proponent shall monitor the environmental quality parameters as per EC and CTE/CTO conditions, and implementation of suggested measures for control of road dust and air pollution. Odisha State Pollution Control Board has to ensure the compliance of CTE/CTO. Regional office of the MoEF&CC, Bhubaneswar shall monitor the compliance of the EC conditions. Regional office of the Indian Bureau of Mines (IBM) shall monitor the compliance of mining plan and progressive mine closure plan. Any violation by mine lease holder may invite actions per the provisions of applicable Acts.

6) Project Proponent shall ensure the compliance of Suggested Ore Transport Mode (SOTM) with association of the State Government of Odisha. All existing mines should ensure adoption of SOTM within next 5 years. New mines or mines seeking expansion should incorporate provision of SOTM in the beginning itself, and should have system in place within next 5 years.

7) The State Govt. of Odisha shall ensure dust free roads in mining areas wherever the road transportation of mineral is involved. The road shoulders shall be paved with fence besides compliance with IRC guidelines. All the roads should have proper drainage system and apart from paving of entire carriage width the remaining right of way should have native plantation (dust capturing species). Further, regular maintenance should also be ensured by the Govt. of Odisha. Progress on development of dust free roads, implementation of SOTM, increased use of existing rail network, development of additional railway network/conveyor belt/ pipelines etc. shall be submitted periodically to Regional office of the MoEF&CC.

8) Project Proponent shall develop the parking plazas for trucks with proper basic amenities/ facilities inside the mine. This should be done within one year for

existing mines and new mines should have since beginning. **This Environmental Clearance for the expansion project shall be operated only after the compliance of the above mentioned specific condition**.

9) Department of Steel & Mines shall ensure the construction of NH 215 as minimum 4 lane road with proper drainage system and plantation and subsequent regular maintenance of the road as per IRC guidelines. Construction of other mineral carrying roads with proper width and drainage system along with road side plantation to be carried out. This shall be completed within 2 Years.

10) Regular vacuum cleaning of all mineral carrying roads aiming at "Zero Dust Re-suspension" shall be adopted by PWD / NHAI/ Mine Lease Holders within a time Period of 3 months for existing roads. **This Environmental Clearance for the expansion project shall be operated only after the compliance of the above mentioned specific condition**.

11) In case the total requirement of iron ore exceeds the suggested limit for that year, permission for annual production by an individual mine may be decided depending on approved EC capacity (for total actual dispatch) and actual production rate of individual mine during last year or any other criteria set by the State Govt., i.e. Dept. of Steel & Mines. Department of Steel and Mines in consultation with Indian Bureau of Mines-RO should prepare in advance mine-wise annual production scenario so that demand for iron ore can be anticipated, and actual production/dispatch does not exceed the suggested annual production.

12) R&D studies towards utilization of low-grade iron ore should be conducted through research/academic institutes like IMMT, Bhubaneswar, NML, Jamshedpur, and concerned metallurgical departments in IITs, NITs etc., targeting full utilization of low-grade iron ore (Fe content upto 45% by 2020 and upto 40% by 2025). In fact, life cycle assessment of whole process including environmental considerations should be done for techno-economic and environmental viability. R&D studies on utilization of mine wastewater having high concentration of Fe content for different commercial applications in industries such as cosmetics, pharmaceutical, paint industry should also be explored. Responsibility: IBM, Dept. of Steel & Mines, Individual Mine Lease Holders.

13) The mining activity in Joda-Koira sector is expected to continue for another 100 years, therefore, it will be desirable to develop proper rail network in the region. Rail transport shall not only be pollution free mode but also will be much economical option for iron ore transport. The rail network and/or conveyor belt system upto public railway siding needs to be created. The total length of the conveyor belt system/ rail network to be developed from mines to nearest railway sidings by 11 mines in Joda region is estimated to be about 64 km. Similarly, in Koira region, total length of rail network/ conveyor system for 8 mines (under SOTM 1 & 2) is estimated to be around 95 km. Further, it is suggested to develop a rail network connecting Banspani (Joda region) and Roxy railway sidings in Koira region. Responsibility: Dept. of Steel & Mines, Govt. of Odisha and Concerned Mines along with Indian Railways. Time Period: Maximum 7 years (by 2025). The Department of Steel & Mines, Govt. of Odisha should follow-up with the concerned Departments and railways so that proposed proper rail network is in place by 2025.

14) State Govt. of Odisha shall make all efforts to ensure exhausting all the iron & manganese ore resources in the existing working mines and from disturbed mining leases/zones in Joda and Koira region. The criteria suggested shall be applicable while suggesting appropriate lease area and sustainable mining rate. Responsibility: Dept. of Steel & Mines, Govt. of Odisha.

15) **Mining Operations/Process Related:** Project Proponent shall implement the following mitigation measures: (i) Appropriate mining process and machinery (viz. right capacity, fuel efficient) should be selected to carry out various mining operations that generate minimal dust/air pollution, noise, wastewater and solid waste. e.g. drills should either be operated with dust extractors or equipped with water injection system. (ii) After commencement of mining operation, a study should be conducted to assess and quantify emission load generation (in terms of air pollution, noise, waste water and solid waste) from each of the mining activity (including transportation) on annual basis. Efforts should be made to further eliminate/ minimize generation of air pollution/dust, noise, wastewater, solid waste generation in successive years through use of better technology. This shall be ensured by the respective mine lease holders. (iii) Various machineries/equipment selected (viz. dumpers, excavators, crushers, screen plants etc.) and transport means should have optimum fuel/power consumption, and their fuel/power consumption should be recorded on monthly basis. Further, inspection and maintenance of all the machineries/ equipment/ transport vehicles should be followed as per manufacturer's instructions/ recommended time schedule and record should be maintained by the respective mine lease holders. (iv) Digital processing of the entire lease area using remote sensing technique should be carried out regularly once in 3 years for monitoring land use pattern and mining activity taken place. Further, the extent of pit area excavated should also be demarcated based on remote sensing analysis. This should be done by ORSAC (Odisha Space Applications Centre, Bhubaneswar) or an agency of national repute or if done by a private agency, the report shall be vetted/ authenticated by ORSAC, Bhubaneswar. Expenses towards the same shall be borne by the respective mine lease holders. Responsibility: Individual Mine Lease Holders.

16) **Air Environment Related:** Project Proponent shall implement the following mitigation measures: (i) Fugitive dust emissions from all the sources should be controlled regularly on daily basis. Water spraying arrangement on haul roads, loading and unloading and at other transfer points should be provided and properly maintained. Further, it will be desirable to use water fogging system to minimize water consumption. It should be ensured that the ambient air quality parameters conform to the norms prescribed by the CPCB in this regard. (ii) The core zone of mining activity should be monitored on daily basis. Minimum four ambient air quality monitoring stations should be established in the core zone for SPM, PM10, PM2.5, SO_2, NO_x and CO monitoring. Location of air quality monitoring stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board (based on Emission Load Assessment Study). The number of monitoring locations may be more for larger capacity mines and working in larger area. Out of four stations, one should be online monitoring station in the mines having more than 3 MTPA EC Capacity. (iii) Monitoring in buffer zone should be carried out by SPCB or through NABET accredited agency. In addition, air quality parameters (SPM, PM10, PM2.5, SO_2, NO_x and CO) shall be regularly monitored at locations of nearest

human habitation including schools and other public amenities located nearest to source of the dust generation as applicable. (iv) Emissions from vehicles as well as heavy machinery should be kept under control and regularly monitored. Measures should be taken for regular maintenance of vehicles used in mining operations and in transportation of mineral. (v) The vehicles shall be covered with a tarpaulin and should not be overloaded. Further, possibility of closed container trucks should be explored for direct to destination movement of iron ore. Air quality monitoring at one location should also be carried out along the transport route within the mine (periodically, near truck entry and exit gate), Responsibility: Individual Mine Lease Holders and SPCB.

17) **Noise and Vibration Related:** Project Proponent shall implement the following mitigation measures: (i) Blasting operation should be carried out only during daytime. Controlled blasting such as Nonel, should be practiced. The mitigation measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented. (ii) Appropriate measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/muffs. (iii) Noise levels should be monitored regularly (on weekly basis) near the major sources of noise generation within the core zone. Further, date, time and distance of measurement should also be indicated with the noise levels in the report. The data should be used to map the noise generation from different activities and efforts should be made to maintain the noise levels with the acceptable limits of CPCB (CPCB, 2000) (iv) Similarly, vibration at various sensitive locations should be monitored atleast once in month, and mapped for any significant changes due to successive mining operations. Responsibility: Individual Mine Lease Holders.

18) **Water/Wastewater Related**: Project Proponent shall implement the following mitigation measures: (i) In general, the mining operations should be restricted to above ground water table and it should not intersect groundwater table. However, if enough resources are estimated below the ground water table, the same may be explored after conducting detailed geological studies by GSI and hydro-geological studies by CGWB or NIH or institute of national repute, and ensuring that no damage to the land stability/ water aquifer system shall happen. The details/ outcome of such study may be reflected/incorporated in the EIA/EMP report of the mine appropriately. (ii) Natural watercourse and/or water resources should not be obstructed due to any mining operations. Regular monitoring of the flow rate of the springs and perennial nallas should be carried out and records should be maintained. Further, regular monitoring of water quality of nallas and river passing thorough the mine lease area (upstream and downstream locations) should be carried out on monthly basis. (iii) Regular monitoring of ground water level and its quality should be carried out within the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should be carried out on monthly basis. (iv) In order to optimize water requirement, suitable conservation measures to augment ground water resources in the area should be undertaken in consultation with Central Ground Water Board (CGWB). (v) Suitable rainwater harvesting measures on long term basis should be planned and implemented in consultation with CGWB, to recharge the ground water source. Further, CGWB can prepare a comprehensive plan for the whole region. (vi) Appropriate mitigation measures (viz. ETP, STP, garland drains, retaining walls, collection of runoff etc.) should be taken to prevent pollution of nearby river/other water bodies. Water quality monitoring study should be conducted

by State Pollution Control Board to ensure quality of surface and ground water sources on regular basis. The study can be conducted through NABL/ NABET approved water testing laboratory. However, the report should be vetted by SPCB. (vii) Industrial wastewater (workshop and wastewater from the mine) should be properly collected, treated in ETP so as to conform to the discharge standards applicable. (viii) Oil and grease trap should be installed before discharge of workshop effluents. Further, sewage treatment plant should be installed for the employees/colony, wherever applicable. (ix) Mine lease holder should ensure that no silt originating due to mining activity is transported in the surface water course or any other water body. Appropriate measures for prevention and control of soil erosion and management of silt should be undertaken. Quantity of silt/soil generated should be measured on regular basis for its better utilization. (x) Erosion from dumps site should be protected by providing geo-textile matting or other suitable material, and thick plantation of native trees and shrubs should be carried out at the dump slopes. Further, dumps should be protected by retaining walls. (xi) Trenches / garland drain should be constructed at the foot of dumps to arrest silt from being carried to water bodies. Adequate number of check dams should be constructed across seasonal/perennial nallas (if any) flowing through the mine lease areas and silt be arrested. De-silting at regular intervals should be carried out and quantity should be recorded for its better utilization, after proper soil quality analysis. (xii) The water so collected in the reservoir within the mine should be utilized for the sprinkling on hauls roads, green belt development etc. (xiii) There should be zero waste water discharge from the mine. Based on actual water withdrawal and consumption/ utilization in different activities, water balance diagram should be prepared on monthly basis, and efforts should be made to optimize consumption of water per ton of ore production in successive years. Responsibility: Individual Mine Lease Holders, SPCB and CGWB.

19) **Land/ Soil/ Overburden Related:** Project Proponent shall implement the following mitigation measures: (i) The top soil should temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long (not more than 3 years or as per provisions mentioned in the mine plan/ scheme). The topsoil should be used for land reclamation and plantation appropriately. (ii) Fodder plots should be developed in the non-mineralized area in lieu of use of grazing land, if any. (iii) Over burden/ low grade ore should be stacked at earmarked dump site (s) only and should not be kept active for long period. The dump height should be decided on case to case basis, depending on the size of mine and quantity of waste material generated. However, slope stability study should be conducted for larger heights, as per IBM approved mine plan and DGMS guidelines. The OB dump should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles should be undertaken for stabilization of the dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Proper records should be maintained regarding species, their growth, area coverage etc. (iv) Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine operation, soil, OB and mineral dumps. The water so collected can be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly de-silted, particularly after monsoon and should be maintained properly. Appropriate documents should be maintained. Garland drain of appropriate size, gradient and length should be constructed for mine pit, soil. OB and mineral dumps and sump capacity should be designed with appropriate safety margin based on long term rainfall data. Sump capacity should be provided for adequate retention period to allow proper settling of silt material. Sedimentation pits should be

constructed at the corners of the garland drains and de-silted at regular intervals. (v) Backfilling should be done as per approved mining plan/scheme. There should be no OB dumps outside the mine lease area. The backfilled area should be afforested, aiming to restore the normal ground level. Monitoring and management of rehabilitated areas should continue till the vegetation is established and becomes self-generating. (vi) Hazardous waste such as, waste oil, lubricants, resin, and coal tar etc. should be disposed off as per provisions of Hazardous Waste Management Rules, 2016, as amended from time to time. Responsibility: Individual Mine Lease Holders.

20) **Ecology/Biodiversity (Flora-Fauna) Related:** Project Proponent shall implement the following mitigation measures: (i) All precautionary measures should be taken during mining operation for conservation and protection of endangered fauna namely elephant, sloth bear etc. spotted in the study area. Action plan for conservation of flora and fauna should be prepared and implemented in consultation with the State Forest and Wildlife Department within the mine lease area, whereas outside the mine lease area, the same should be maintained by State Forest Department. (ii) Afforestation is to be done by using local and mixed species saplings within and outside the mining lease area. The reclamation and afforestation is to be done in such a manner like exploring the growth of fruit bearing trees which will attract the fauna and thus maintaining the biodiversity of the area. As afforestation done so far is very less, forest department needs to identify adequate land and do afforestation by involving local people in a time bound manner. (iii) Green belt development carried out by mines should be monitored regularly in every season and parameters like area under vegetation/plantation, type of plantation, type of tree species /grass species/scrubs etc., distance between the plants and survival rate should be recorded. (iv) Greenbelt is an important sink of air pollutants including noise. Development of green cover in mining area will not only help reducing air and noise pollution but also will improve the ecological conditions and prevent soil erosion to a greater extent. Further, selection of tree species for green belt should constitute dust removal/dust capturing plants since plants can act as efficient biological filters removing significant amounts of particulate pollution. Thus, the identified native trees in the mine area may be encouraged for plantation. Tree species having small leaf area, dense hair on leaf surface (rough surface), deep channels on leaves should be included for plantation. (v) Vetiver plantation on inactive dumps may be encouraged as the grass species has high strength of anchoring besides medicinal value. (vi) Details of compensatory afforestation done should be recorded and documented by respective forest divisions, and State Forest Department should present mine-wise annual status, along with expenditure details. Responsibility: Individual Mine Lease Holders and State Forest & Wildlife Department.

21) **Socio-Economic Related:** Project Proponent shall implement the following mitigation measures: (i) Public interaction should be done on regular basis and social welfare activities should be done to meet the requirements of the local communities. Further, basic amenities and infrastructure facilities like education, medical, roads, safe drinking water, sanitation, employment, skill development, training institute etc. should be developed to alleviate the quality of life of the people of the region. (ii) Land outees and land losers/affected people, if any, should be compensated and rehabilitated as per the national/state policy on Resettlement and Rehabilitation. (iii) The socio-economic development in the region should be focused and aligned with the guidelines/initiatives of Govt. of India/ NITI Aayog around prosperity, equality,

justice, cleanliness, transparency, employment, respect to women, hope etc. This can be achieved by providing adequate and quality facilities for education, medical and developing skills in the people of the region. District administration in association with mine lease holders should plan for "Samagra Vikas" of these blocks well as other blocks of the district. While planning for different schemes in the region, the activities should be prioritized as per Pradhan Mantri Khanij Kshetra Kalyan Yojna (PMKKKY), notified by Ministry of Mines, Govt. of India, vide letter no. 16/7/2017-M.VI (Part), dated September 16, 2015. Responsibility: District Administration and Individual Mine Lease Holders.

22) **Road Transport Related:** Project Proponent shall implement the following mitigation measures: (i) All the mine lease holders should follow the suggested ore transport mode (SOTM), based on its EC capacity within next 5 years. (ii) The mine lease holders should ensure construction of cement road of appropriate width from and to the entry and exit gate of the mine. Further, maintenance of all the roads should be carried out as per the requirement to ensure dust free road transport. (iii) Transportation of ore should be done by covering the trucks with tarpaulin or other suitable mechanism so that no spillage of ore/dust takes place. Further, air quality in terms of dust, PM10 should be monitored near the roads towards entry & exit gate on regular basis, and be maintained within the acceptable limits. Responsibility: Individual Mine Lease Holders and Dept. of Steel & Mines.

23) **Occupational Health Related:** Project Proponent shall implement the following mitigation measures: (i) Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects periodically. (ii) Occupational health surveillance program for all the employees/workers (including casual workers) should be undertaken periodically (on annual basis) to observe any changes due to exposure to dust, and corrective measures should be taken immediately, if needed. (iii) Occupational health and safety measures related awareness programs including identification of work related health hazard, training on malaria eradication, HIV and health effects on exposure to mineral dust etc., should be carried out for all the workers on regular basis. A full time qualified doctor should be engaged for the purpose. Periodic monitoring (on 6 monthly basis) for exposure to respirable minerals dust on the workers should be conducted, and record should be maintained including health record of all the workers. Review of impact of various health measures undertaken (at an interval of 3 years or less) should be conducted followed by follow-up of actions, wherever required. Occupational health centre should be established near mine site itself. Responsibility: Individual Mine Lease Holders and District Administration (District Medical Officer).

C. STANDARD CONDITIONS FOR MINING OF MINERALS

I. Statutory compliance

1) This Environmental Clearance (EC) is subject to orders/ judgment of Hon'ble Supreme Court of India, Hon'ble High Court, Hon'ble NGT and any other Court of Law, Common Cause Conditions as may be applicable.

2) The Project proponent complies with all the statutory requirements and judgment of Hon'ble Supreme Court dated 2nd August, 2017 in Writ Petition (Civil) No. 114 of 2014 in

matter of Common Cause versus Union of India &Ors before commencing the mining operations.

3) The State Government concerned shall ensure that mining operation shall not be commenced till the entire compensation levied, if any, for illegal mining paid by the Project Proponent through their respective Department of Mining & Geology in strict compliance of Judgment of Hon'ble Supreme Court dated 2nd August, 2017 in Writ Petition (Civil) No. 114 of 2014 in matter of Common Cause versus Union of India & Ors.

4) The Project Proponent shall follow the mitigation measures provided in MoEFCC's Office Memorandum No. Z-11013/57/2014-IA.II (M), dated 29th October, 2014, titled "Impact of mining activities on Habitations-Issues related to the mining Projects wherein Habitations and villages are the part of mine lease areas or Habitations and villages are surrounded by the mine lease area".

5) A copy of EC letter will be marked to concerned Panchayat / local NGO etc. if any, from whom suggestion / representation has been received while processing the proposal.

6) State Pollution Control Board/Committee shall be responsible for display of this EC letter at its Regional office, District Industries Centre and Collector's office/ Tehsildar's Office for 30 days.

7) The Project Authorities should widely advertise about the grant of this EC letter by printing the same in at least two local newspapers, one of which shall be in vernacular language of the concerned area. The advertisement shall be done within 7 days of the issue of the clearance letter mentioning that the instant project has been accorded EC and copy of the EC letter is available with the State Pollution Control Board/Committee and web site of the Ministry of Environment, Forest and Climate Change (www.parivesh.nic.in). A copy of the advertisement may be forwarded to the concerned MoEFCC Regional Office for compliance and record.

8) The Project Proponent shall inform the MoEF&CC for any change in ownership of the mining lease. In case there is any change in ownership or mining lease is transferred. PP needs to apply for transfer of EC as per provisions of the para 11 of EIA Notification, 2006 as amended from time to time.

II. Air quality monitoring and preservation

9) The Project Proponent shall install a minimum of 3 (three) online Ambient Air Quality Monitoring Stations with 1 (one) in upwind and 2 (two) in downwind direction based on long term climatological data about wind direction such that an angle of 120° is made between the monitoring locations to monitor critical parameters, relevant for mining operations, of air pollution viz. PM10, PM2.5, NO2, CO and SO2 etc. as per the methodology mentioned in NAAQS Notification No. B-29016/20/90/PCI/I, dated 18.11.2009 covering the aspects of transportation and use of heavy machinery in the impact zone. The ambient air quality shall also be monitored at prominent places like office building, canteen etc. as per the site

condition to ascertain the exposure characteristics at specific places. The above data shall be digitally displayed within 03 months in front of the main Gate of the mine site.

10) Effective safeguard measures for prevention of dust generation and subsequent suppression (like regular water sprinkling, metalled road construction etc.) shall be carried out in areas prone to air pollution wherein high levels of PM10 and PM2.5 are evident such as haul road, loading and unloading point and transfer points. The Fugitive dust emissions from all sources shall be regularly controlled by installation of required equipments/ machineries and preventive maintenance. Use of suitable water-soluble chemical dust suppressing agents may be explored for better effectiveness of dust control system. It shall be ensured that air pollution level conform to the standards prescribed by the MoEFCC/ Central Pollution Control Board.

III. Water quality monitoring and preservation

11) In case, immediate mining scheme envisages intersection of ground water table, then Environmental Clearance shall become operational only after receiving formal clearance from CGWA. In case, mining operation involves intersection of ground water table at a later stage, then PP shall ensure that prior approval from CGWA and MoEFCC is in place before such mining operations. The permission for intersection of ground water table shall essentially be based on detailed hydro-geological study of the area.

12) Project Proponent shall regularly monitor and maintain records w.r.t. ground water level and quality in and around the mine lease by establishing a network of existing wells as well as new piezo-meter installations during the mining operation in consultation with Central Ground Water Authority/ State Ground Water Department. The Report on changes in Ground water level and quality shall be submitted on six-monthly basis to the Regional Office of the Ministry, CGWA and State Groundwater Department / State Pollution Control Board.

13) The Project Proponent shall undertake regular monitoring of natural water course/ water resources/ springs and perennial nallahs existing/ flowing in and around the mine lease including upstream and downstream. Sufficient number of gullies shall be provided at appropriate places within the lease for management of water. The parameters to be monitored shall include their water quality vis-à-vis suitability for usage as per CPCB criteria and flow rate. It shall be ensured that no obstruction and/ or alteration be made to water bodies during mining operations without justification and prior approval of MoEFCC. The monitoring of water courses/ bodies existing in lease area shall be carried out four times in a year viz. pre- monsoon (April May), monsoon (August), post-monsoon (November) and winter (January) and the record of monitored data may be sent regularly to Ministry of Environment, Forest and Climate Change and its Regional Office, Central Ground Water Authority and Regional Director, Central Ground Water Board, State Pollution Control Board and Central Pollution Control Board. Clearly showing the trend analysis on six-monthly basis.

14) Quality of polluted water generated from mining operations which include Chemical Oxygen Demand (COD) in mines run-off; acid mine drainage and metal contamination in runoff shall be monitored along with Total Suspended Solids (TDS), Dissolved Oxygen (DO), pH and Total Suspended Solids (TSS). The monitored data shall be uploaded on the website of the company as well as displayed at the project site in public domain, on a display board, at a suitable location near the main gate of the Company. The circular No. J-20012/1/2006-IA.II (M) dated 27.05.2009 issued by Ministry of Environment, Forest and Climate Change may also be referred in this regard.

15) Project Proponent shall plan, develop and implement rainwater harvesting measures on long term basis to augment ground water resources in the area in consultation with Central Ground Water Board/ State Groundwater Department. A report on amount of water recharged needs to be submitted to Regional Office MoEFCC annually.

16) Industrial waste water (workshop and waste water from the mine) should be properly collected and treated so as to conform to the notified standards prescribed from time to time. The standards shall be prescribed through Consent to Operate (CTO) issued by concerned State Pollution Control Board (SPCB). The workshop effluent shall be treated after its initial passage through Oil and grease trap.

17) The water balance/water auditing shall be carried out and measure for reducing the consumption of water shall be taken up and reported to the Regional Office of the MoEF&CC and State Pollution Control Board/Committee.

IV. Noise and vibration monitoring and prevention

18) The peak particle velocity at 500m distance or within the nearest habitation, whichever is closer shall be monitored periodically as per applicable DGMS guidelines.

19) The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day /night hours.

20) The Project Proponent shall take measures for control of noise levels below 85 dBA in the work environment. The workers engaged in operations of HEMM, etc. should be provided with ear plugs /muffs. All personnel including laborers working in dusty areas shall be provided with protective respiratory devices along with adequate training, awareness and information on safety and health aspects. The PP shall be held responsible in case it has been found that workers/ personals/ laborers are working without personal protective equipment.

V. Mining plan

21) The Project Proponent shall adhere to approved mining plan, inter alia, including, total excavation (quantum of mineral, waste, over burden, inter burden and top soil etc.); mining technology; lease area; scope of working (method of mining, overburden & dump management, O.B& dump mining, mineral transportation mode, ultimate depth of mining, concurrent reclamation and reclamation at mine closure; land-use of the mine lease area at various stages of mining scheme as well as at the end-of-life; etc.).

22) The land-use of the mine lease area at various stages of mining scheme as well as at the end-of-life shall be governed as per the approved Mining Plan. The excavation vis-à-vis backfilling in the mine lease area and corresponding afforestation to be raised in the reclaimed area shall be governed as per approved mining plan. PP shall ensure the monitoring and management of rehabilitated areas until the vegetation becomes self-sustaining. The compliance status shall be submitted half-yearly to the MoEFCC and its concerned Regional Office.

VI. Land reclamation

23) The Overburden (O.B.), waste and topsoil generated during the mining operations shall be stacked at earmarked OB dump site(s) only and it should not be kept active for a long period of time. The physical parameters of the OB / waste dumps / topsoil dump like height, width and angle of slope shall be governed as per the approved Mining Plan and the guidelines/circulars issued by D.G.M.S. The topsoil shall be used for land reclamation and plantation.

24) The slope of dumps shall be vegetated in scientific manner with suitable native species to maintain the slope stability, prevent erosion and surface run off. The selection of local species regulates local climatic parameters and help in adaptation of plant species to the microclimate. The gullies formed on slopes should be adequately taken care of as it impacts the overall stability of dumps. The dump mass should be consolidated with the help of dozer/ compactors thereby ensuring proper filling/ leveling of dump mass. In critical areas, use of geo textiles/ geo-membranes / clay liners / Bentonite etc. shall be undertaken for stabilization of the dump.

25) Catch drains, settling tanks and siltation ponds of appropriate size shall be constructed around the mine working, mineral yards and Top Soil/OB/Waste dumps to prevent run off of water and flow of sediments directly into the water bodies (Nallah/ River/ Pond etc.). The collected water should be utilized for watering the mine area, roads, green belt development, plantation etc. The drains/ sedimentation sumps etc. shall be de-silted regularly, particularly after monsoon season, and maintained properly.

26) Check dams of appropriate size, gradient and length shall be constructed around mine pit and OB dumps to prevent storm run-off and sediment flow into adjoining water bodies. A safety margin of 50% shall be kept for designing of sump structures over and above peak rainfall (based on 50 years data) and maximum discharge in the mine and its adjoining area which shall also help in providing adequate retention time period thereby

allowing proper settling of sediments/ silt material. The sedimentation pits/ sumps shall be constructed at the corners of the garland drains.

VII. Transportation

27) No Transportation of the minerals shall be allowed in case of roads passing through villages/ habitations. In such cases, PP shall construct a 'bypass' road for the purpose of transportation of the minerals leaving an adequate gap (say at least 200 meters) so that the adverse impact of sound and dust along with chances of accidents could be mitigated. All costs resulting from widening and strengthening of existing public road network shall be borne by the PP in consultation with nodal State Govt. Department. Transportation of minerals through road movement in case of existing village/ rural roads shall be allowed in consultation with nodal State Govt. Department only after required strengthening such that the carrying capacity of roads is increased to handle the traffic load. The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly. Vehicular emissions shall be kept under control and regularly monitored. Project should obtain Pollution Under Control (PUC) certificate for all the vehicles from authorized pollution testing centers. [If applicable in case of road transport].

28) The Main haulage road within the mine lease should be provided with a permanent water sprinkling arrangement for dust suppression. Other roads within the mine lease should be wetted regularly with tanker-mounted water sprinkling system. The other areas of dust generation like crushing zone, material transfer points, material yards etc. should invariably be provided with dust suppression arrangements. The air pollution control equipments like bag filters, vacuum suction hoods, dry fogging system etc. shall be installed at Crushers, belt-conveyors and other areas prone to air pollution. The belt conveyor should be fully covered to avoid generation of dust while transportation. PP shall take necessary measures to avoid generation of fugitive dust emissions.

VIII. Green Belt

29) The Project Proponent shall develop greenbelt in 7.5m wide safety zone all along the mine lease boundary as per the guidelines of CPCB in order to arrest pollution emanating from mining operations within the lease. The whole Green belt shall be developed within first 5 years starting from windward side of the active mining area. The development of greenbelt shall be governed as per the EC granted by the Ministry irrespective of the stipulation made in approved mine plan.

30) The Project Proponent shall carryout plantation/ afforestation in backfilled and reclaimed area of mining lease, around water body, along the roadsides, in community areas etc. by planting the native species in consultation with the State Forest Department/ Agriculture Department/ Rural development department/ Tribal Welfare Department/ Gram Panchayat such that only those species be selected which are of use to the local people. The CPCB guidelines in this respect shall also be adhered. The density of the trees should be around 2500 saplings per Hectare. Adequate budgetary provision shall be made for protection and care of trees.

31) The Project Proponent shall make necessary alternative arrangements for livestock feed by developing grazing land with a view to compensate those areas which are coming within the mine lease. The development of such grazing land shall be done in consultation with the State Government. In this regard, Project Proponent should essentially implement the directions of the Hon'ble Supreme Court with regard to acquisition of grazing land. The sparse trees on such grazing ground, which provide mid-day shelter from the scorching sun, should be scrupulously guarded/ protected against felling and plantation of such trees should be promoted.

IX. Public hearing and human health issues

32) Project Proponent shall make provision for the housing for workers/labors or shall construct labor camps within/outside (company owned land) with necessary basic infrastructure/ facilities like fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche for kids etc. The housing may be provided in the form of temporary structures which can be removed after the completion of the project related infrastructure. The domestic waste water should be treated with STP in order to avoid contamination of underground water.

X. Corporate Environment Responsibility (CER)

33) The Project Proponent shall submit the time- bound action plan to the concerned regional office of the Ministry within 6 months from the date of issuance of environmental clearance for undertaking the activities committed during public consultation by the project proponent and as discussed by the EAC, in terms of the provisions of the MoEF&CC Office Memorandum No.22-65/2017-IA.III dated 30 September, 2020. The action plan shall be implemented within three years of commencement of the project.

XI. Miscellaneous

34) The Project Proponent shall prepare digital map (land use & land cover) of the entire lease area once in five years purpose of monitoring land use pattern and submit a report to concerned Regional Office of the MoEF&CC.

35) The Project Authorities should inform to the Regional Office regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.

36) The Project Proponent shall submit six monthly compliance reports on the status of the implementation of the stipulated environmental safeguards to the MOEFCC & its concerned Regional Office, Central Pollution Control Board and State Pollution Control Board.

37) A separate 'Environmental Management Cell' with suitable qualified manpower should be set-up under the control of a Senior Executive. The Senior Executive shall

directly report to Head of the Organization. Adequate number of qualified Environmental Scientists and Mining Engineers shall be appointed and submit a report to RO, MoEF&CC.

38) The concerned Regional Office of the MoEF&CC shall randomly monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the MoEF&CC officer(s) by furnishing the requisite data / information / monitoring reports.

39) In pursuant to Ministry's O.M No 22-34/2018-IA.III dated 16.01.2020 to comply with the direction made by Hon'ble Supreme Court on 8.01.2020 in W.P. (Civil) No 114/2014 in the matter Common Cause vs Union of India, the mining lease holder shall after ceasing mining operations, undertake regrassing the mining area and any other area which may have been disturbed due to other mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.

40) The Ministry or any other competent authority may alter/modify the above conditions or stipulate any further condition in the interest of environment protection.

41) Concealing factual data failure to comply with any or submission of false/ fabricated data and of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

D. STANDARD EC CONDITIONS FOR MINERAL BENEFICIATION PLANTS:

I. Statutory compliance:

1) The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.

2) The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.

3) The project proponent shall prepare a Site-Specific Conservation Plan & Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations of the approved Site-Specific Conservation Plan / Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report. (in case of the presence of Schedule-I species in the study area).

4) The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 197 4 from the concerned State Pollution Control Board/ Committee.

5) The project proponent shall obtain the necessary permission from the Central Ground Water Authority, in case of drawl of ground water / from the competent authority concerned in case of drawl of surface water required for the project.

6) The project proponent shall obtain authorization under the Hazardous and other Waste Management Rules, 2016 as amended from time to time.

II. Air quality monitoring and preservation

7) The project proponent shall install 24x7 continuous emission monitoring system at process stacks to monitor stack emission with respect to standards prescribed in Environment (Protection) Rules 1986 as amended from time to time and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through labs recognised under Environment (Protection) Act, 1986 or NABL accredited laboratories. Monitor fugitive emissions in the plant premises.

8) The project proponent shall monitor fugitive emissions in the plant premises at least once in every quarter through labs recognised under Environment (Protection) Act, 1986. 9) The project proponent shall install system to carryout Continuous Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g., PM10 and PM2.5 in reference to PM emission, and SO2 and NOx in reference to S02 and NOx emissions) within and outside the plant area at least at four locations (one within and three outside the plant area at an angle of 120'each). covering upwind and downwind directions.

9) The project proponent shall install system to carryout Continuous Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g., PM10 and PM2.5 in reference to PM emission, and SO2 and NOx in reference to S02 and NOx emissions) within and outside the plant area at least at four locations (one within and three outside the plant area at an angle of 120'each). covering upwind and downwind directions.

10) The project proponent shall submit monthly summary report of continuous stack emission and air quality monitoring and results of manual stack monitoring and manual monitoring of air quality /fugitive emissions to Regional Office of MoEF&CC, Zonal office of CPCB and Regional Office of SPCB along with six-monthly monitoring report.

11) Appropriate Air Pollution Control (APC) system shall be provided for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed stack emission and fugitive emission standards.

12) The project proponent use leak proof trucks/dumpers carrying ore and other raw materials and cover them with tarpaulin.

13) Wind shelter fence and chemical spraying shall be provided on the raw material stock piles.

14) Design the ventilation system for adequate air changes as per ACGIH document for all tunnels, motor houses, Oil Cellars.

III. Water quality monitoring and preservation

15) The project proponent shall install 24x7 continuous effluent monitoring system with respect to standards prescribed in Environment (Protection) Rules 1986 as amended from time to time and connected to SPCB and CPCB online servers and calibrate these system from time to time according to equipment supplier specification through

labs recognised under Environment (Protection) Act, 1986 or NABL accredited laboratories.

16) The project proponent shall monitor regularly ground water quality at least twice a year (pre and post monsoon) at sufficient numbers of piezometers/sampling wells in the plant and adjacent areas through labs recognised under Environment (Protection) Act, 1986 and NABL accredited laboratories.

17) The project proponent shall submit monthly summary report of continuous effluent monitoring and results of manual effluent testing and manual monitoring of ground water quality to Regional Office of MoEF&CC, Zonal office of CPCB and Regional Office of SPCB along with six-monthly monitoring report.

18) The project proponent shall provide the slime disposal facility with impervious lining and collection wells for seepage. The water collected from the slime pond shall be treated and recycled.

19) Adhere to 'Zero Liquid Discharge'

20) Sewage Treatment Plant shall be provided for treatment of domestic wastewater to meet the prescribed standards.

21) Garland drains and collection pits shall be provided for each stock pile to arrest the run-off in the event of heavy rains and to check the water pollution due to surface run off.

22) The project proponent shall practice rainwater harvesting to maximum possible extent.

23) The project proponent shall make efforts to minimise water consumption in the steel plant complex by segregation of used water, practicing cascade use and by recycling treated water.

IV. Noise monitoring and prevention

24) Noise level survey shall be carried as per the prescribed guidelines and report in this regard shall be submitted to Regional Officer of the Ministry as a part of six-monthly compliance report.

25) The ambient noise levels should conform to the standards prescribed under E(P)A Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time.

V. Energy Conservation measures

26) Provide solar power generation on roof tops of buildings, for solar light system for all common areas, street lights, parking around project area and maintain the same regularly;

27) Provide LED lights in their offices and residential areas.

VI. Waste management

28) The waste oil, grease and other hazardous waste shall be disposed of as per the Hazardous & Other waste (Management & Transboundary Movement) Rules, 2016

29) Kitchen waste shall be composted or converted to biogas for further use.(to be decided on case to case basis depending on type and size of plant)

VII. Green Belt and EMP

30) Green belt shall be developed in an area equal to 33% of the plant area with a native tree species in accordance with CPCB guidelines. The greenbelt shall inter alia cover the entire periphery of the plant

31) The project proponent shall prepare GHG emissions inventory for the plant and shall submit the programme for reduction of the same including carbon sequestration including plantation.

VIII. Public hearing and Human health issues

32) Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.

33) The project proponent shall carry out heat stress analysis for the workmen who work in high temperature work zone and provide Personal Protection Equipment (PPE) as per the norms of Factory Act.

34) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

35) Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

IX. Corporate Environment Responsibility

36) The Project Proponent shall submit the time- bound action plan to the concerned regional office of the Ministry within 6 months from the date of issuance of environmental clearance for undertaking the activities committed during public consultation by the project proponent and as discussed by the EAC, in terms of the provisions of the MoEF&CC Office Memorandum No.22-65/2017-IA.III dated 30 September, 2020. The action plan shall be implemented within three years of commencement of the project.

37) The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest /wildlife norms/ conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest I wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report.

38) A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.

39) Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.

40) Self-environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.

41) All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Mineral Beneficiation plants shall be implemented.

X. Miscellaneous

42) The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.

43) The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.

44) The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

45) The project proponent shall monitor the criteria pollutants level namely; PM10, S02, NOx (ambient levels as well as stack emissions) or critical sectoral parameters, indicated for the projects and display the same at a convenient location for disclosure to the public and put on the website of the company.

46) The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.

47) The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.

48) The project proponent shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.

49) The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

50) The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.

51) No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).

5. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules made there under and also any other orders passed by the Hon'ble Supreme Court of India/High Court and any other Court of Law relating to the subject matter.

6. Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

7. This issues with the approval of Competent Authority.

Yours faithfully,

(Pankaj Verma)
Scientist 'E'

Copy to:

i. **The Secretary,** Ministry of Mines, Government of India Shastri Bhawan, New Delhi.
ii. **The Chief Secretary,** Government of Odisha, Secretariat, Bhubaneswar.
iii. **The Secretary,** Department of Environment, Government of Odisha, Secretariat, Bhubaneswar.
iv. **The Secretary,** Department of Mines and Geology, Government of Odisha, Secretariat, Bhubaneswar.
v. **The Secretary,** Department of Forests, Government of Odisha, Secretariat, Bhubaneswar.
vi. **The Secretary,** Department of Steel and Mines, Government of Odisha, Secretariat, Bhubaneswar.
vii. **The Member Secretary,** Odisha Pollution Control Board, Parivesh Bhawan, A/118 Nilakantha Nagar, Unit-VIII, Bhubaneswar-751012.
viii. **The Deputy Director General of Forests (C),** Ministry of Environment, Forest and Climate Change, Integrated Regional Office, A/3, Chandersekharpur, Bhubaneswar – 751023.
ix. **The Chief Wildlife Warden,** Prakurti Bhawan, 5th floor, BDA Apartment, Nilakanthanagar, Nayapalli, Bhubaneswar-751012, Odisha.
x. **The Chairman,** Central Pollution Control Board, Parivesh Bhawan, CBD-Cum-Office Complex, East Arjun Nagar, New Delhi-110 032.
xi. **The Controller General,** Indian Bureau of Mines, Indira Bhavan, Civil Lines, Nagpur-440001.

xii. **The Member Secretary,** Central Ground Water Board, Ministry of Agriculture and Irrigation, 12/1 Jam Nagar House, Shahjahan road, New Delhi 110011.
xiii. **The District Collector,** Sundargarh District, Govt. of Odisha.
xiv. **Guard File.**
xv. **PARIVESH Portal.**

(Pankaj Verma)
Scientist 'E'

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