

EXECUTIVE SUMMARY

1.0 INTRODUCTION

M/s. Shri Bajrang Power and Ispat Limited is operating integrated steel plant at village -Tandwa & Kundru, Tehsil- Tilda, District- Raipur, Chhattisgarh. The existing project was accorded environment clearance from MOEF vide letter no J-11011/397/2009-IA-II(I) dated 06.10.2010; Expansion of Plant (Iron Ore Beneficiation and Palletization plant) was accorded EC on 23.05.2012; change in configuration in SID and Power Plant without change in capacity and addition of coal gasifier and Fly Ash Brick Plant on 06.09.2016 and extension of validity of EC obtained on 12.07.2019. Renewal of Consent to Operate (CTO) for the existing unit was accorded by CECB vide letter no 9651/TS/CECB/2024 dated 01.03.2024. The validity of CTO is up to 28.02.2029.

Now it is proposed to go for expansion of existing integrated Steel Plant -DRI Kilns (Sponge Iron 0.6 MTPA to 0.8 MTPA), Power Plant (WHRB 48 MW to 129 MW, AFBC/CFBC 9 MW to 124 MW), Existing I/O Beneficiation Plant 2.0 MTPA, Pellet plant 1.4 MTPA, Establishment of new EOF/BOF and IF with matching capacity of LRF & CCM (2.2 MTPA), New Sinter Plant (1.2 MTPA), New Coke Oven Plant (0.7 MTPA), New Blast furnace (1250 m³ size)-1.5 MTPA, New Slab/Rolling Mill (Long/Flat)-(2.0 MTPA) expansion of Ferro Alloy with AOD (45,000 TPA to 90,000 TPA), Oxygen Plant 24 TPD to 674 TPD.

The total area of the plant after the proposed expansion will be 197.936 ha [Existing Plant land - 141.15 ha, Proposed additional land - 56.786 ha]. The total land is under the possession of the company.

As per the Ministry of Environment, Forests & Climate Change, New Delhi notification, dated 14th September, 2006 and its subsequent amendments, all Primary metallurgical processing industries are classified under Category 'A' and requires Environmental Clearance (EC) to be obtained from MoEF&CC, New Delhi.

The project proponents have submitted prescribed application along with Pre-Feasibility Report to the MOEF&CC, New Delhi on dated 08.08.2024 vide proposal No: IA/CG/IND1/486127/2024 for seeking terms of references for conducting the EIA Study. The proposal was considered in the 65th meeting of the EAC (Industry-I) held

during 05-06-09 September, 2024 and Accordingly, ToR was granted (vide. F. No. J-11011/394/2009-IA. II(I) on 20.10. 2024.

Parivesh Environmental Engineering Services, Lucknow, is QCI-NABET accredited in Category "A" environment consultant organization has been assigned to undertake an Environmental Impact Assessment (EIA) study and preparation of Environment Management Plan (EMP) for various environmental components, which may be affected due to the impacts arising out of the proposed project.

The Environmental Impact Assessment (EIA) report is prepared for obtaining Environmental Clearance (EC) from Ministry of Environment, Forest and Climate Changes (MoEF&CC), New Delhi for the proposed expansion project.

1.1 Plant Configuration and production capacity

Table E-1: Existing & Proposed Units, Products & their Production Capacities

S. No	Facility	Product	Existing Capacity MTPA (EC Obtained)/CTE	CTO Obtained (Under operation) MTPA	Proposed Additional Capacity MTPA	Production Total capacity after expansion (MTPA)		
1	Sponge Iron	Sponge Iron	0.60	0.60	0.2	0.8		
2	Power Plant (125 MW)	WHRB	Electricity	48	48	16	129	
		Blast F/C	Electricity	10	Not implemented and EC lapsed	30		
		Coke Oven	Electricity	25	Not implemented and EC lapsed	35		
		CFBC/AFBC	Electricity	-		115		115
		AFBC	Electricity	42	9	-		9
3	Hot Re-Rolling Mill		0.40	Not implemented and EC lapsed				
4	Pellet Plant	Pellets	1.4	1.4	-	1.4		
	Coal Gasifier	Producer Gas	3x17000 Nm ³ /hr	1x17000 Nm ³ /hr + 1x5500 Nm ³ /hr	-1x17000 Nm ³ /hr + 1x5500 Nm ³ /hr	2x17000 Nm ³ /hr + 2x5500 Nm ³ /hr		
5	Iron Ore Beneficiation Plant	2.0 MTPA	2.0	2.0	-	2.0		
6	Ferro Alloys with AOD (Fe-Mn/Si-Mn)	Ferro Alloys	36000 TPA+ 9000TPA(UNDER NIPL)	45000 TPA	45000 TPA	90,000 TPA		
7	Steel Melting Shop & CCM	Hot Billets / MS Billets /	1.0	Not implemented and EC lapsed	2.2	2.2		

S. No	Facility	Product	Existing Capacity MTPA (EC Obtained)/CTE	CTO Obtained (Under operation) MTPA	Proposed Additional Capacity MTPA	Production Total capacity after expansion (MTPA)
		Slabs				
8	Coal Washery	2.4 MTPA	2.4	Dropped	-	Dropped
9	Coke Oven Battery	Coke	0.50	Not implemented and EC lapsed	0.7	0.7
10	Sinter Plant	Sinters	0.70	Not implemented and EC lapsed	1.2	1.2
11	Blast Furnace	Pig iron/Hot Metal	0.55	Not implemented and EC lapsed	1.5	1.5
12	Oxygen Plant	Oxygen	500 TPD	24TPD	650TPD	674 TPD
13	Fly Ash Bricks	Fly ash Bricks	100,00,000 Nos per Annum	100,00,000 Nos per Annum	-	100,00,000 Nos per Annum
14	Slab/Rolling Mill (Long/Flat)	Rolled Products	0.4	Not implemented and EC lapsed	2.0	2.0
15	ERW C.S./M.S. Pipes Tubular Section & Hollow Section of capacity	-	0.5	0.25	-	0.25
16	Galvanized Pipe / Hollow Section	-	0.1	0.1	-	0.1
17	Railway Siding with wagon & Tippler	-	12000 TPD	12000 TPD	-	12000 TPD

1.2 Location and accessibility

M/s Shri Bajrang Power and Ispat Limited is an existing plant site which falls in the Survey of India (SI) Toposheet No. F44 P13 at Village -Tandwa & Kundru, Tehsil- Tilda, District- Raipur, Chhattisgarh. The Co-ordinates of the project site are given below:

Table.E-2: Pillar Co-ordinates

Point	Latitude	Longitude
1	21°29' 51.719" N	81°46' 11.989" E
2	21°29' 50.685" N	81°46' 21.337" E
3	21°29' 41.514" N	81°46' 23.619" E
4	21°29' 32.579" N	81°46' 33.921" E
5	21°29' 28.109" N	81°46' 39.769" E
6	21°29' 1.483" N	81°46' 33.671" E
7	21°28' 51.180" N	81°46' 20.593" E
8	21°29' 2.833" N	81°45' 57.860" E

9	21°29' 7.682" N	81°45' 45.596" E
10	21°29' 16.586" N	81°45' 40.997" E
11	21°29' 31.624" N	81°45' 40.242" E
12	21°29' 35.948" N	81°45' 47.387" E
13	21°29' 39.609" N	81°45' 51.895" E
14	21°29' 42.651" N	81°45' 53.706" E
15	21°29' 47.595" N	81°45' 56.038" E
16	21°29' 46.676" N	81°45' 59.811" E
17	21°29' 47.817" N	81°46' 7.516" E

The following is the environmental setting within the 10 Km. radius of the plant site:

Table E-3: Environmental features within 10 Km. radius of the plant site

S. No.	Particulars	Details			
1.	Toposheet No.	F44 P13 (Project site)			
2.	Elevation	MSL of Project Site 292 to 310 m above mean sea level			
3.	Nearest Habitation/ town	Kundru Village - 0.5 Kms			
4.	Nearest Highway	S. No.	Particulars	Distance (Km) (From Project Boundary)	Direction
		1.	NH-30	6.42	E
		2.	NH 130 B	11.9	SE
		3.	Tilda Simga Road	4.88	ENE
5.	Nearest Railway Station	Baikunth Railway Station 0.7 Kms, E			
6.	Nearest Airport	Swami Vivekanand Airport Raipur-31.8 km, S			
7.	Nearest Tourist Places	None within 10 Km radius			
8.	Défense Installations	None within 10 Km radius.			
9.	Archaeological Sites	None within 10 Km radius.			
10.	Eco sensitive Zone	None within 10 Km radius.			
11.	Reserve /Protected Forests	There are no National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve/ migratory routes for Birds with in 10 Km. radius of the plant. Bilari Ghughua RF-9.8 km -N direction Bilari RF-7.7 km -NNW direction Mohrenga PF-10.1 km -ESE direction Khulidabri PF-13.2 km -ESE direction			
12.	Water bodies	S. No.	Particulars	Distance (Km) (From Project Boundary)	Direction
		1.	Dhumma Nala	Adjacent site	S
		2.	Canal	Passing near plant boundary within the plant	-
		3.	(Mahanadi Canal)	1.3	SE
		4.	Kirna Tank	1.4	SSE
		5.	Jamuniya Nala	5.5	E
		6.	Jamuniya Nadi	7.8	NE
		7.	Patthra Nala	9	SE
		8.	Kulhan Nala	8.2	WSW
13.	Seismic Zone	Seismic Zone – II: According to BMTPC's vulnerability			

		atlas, II edition, the area falls in a region of Low damage risk zone.
14.	Interstate boundary	None within 10 Km radius.

2.0 PROJECT DESCRIPTION

As per Environmental Impact Assessment Notification dated 14th September, 2006 and subsequent amendment thereof, the proposed (Expansion) project falls under S. No. 3 (a) under category "A" and requires Environmental Clearance (EC) to be obtained from MoEF&CC, New Delhi.

M/s. Shri Bajrang Power and Ispat Limited is an existing plant located at Village - Tandwa & Kundru, Tehsil- Tilda, District- Raipur, Chhattisgarh. Now as a part of expansion, company is planning for expansion of existing integrated Steel Plant -DRI Kilns (Sponge Iron 0.6 MTPA to 0.8 MTPA), Power Plant (WHRB 48 MW to 129 MW, AFBC/CFBC 9 MW to 124 MW), Existing I/O Beneficiation Plant 2.0 MTPA, Pellet plant 1.4 MTPA, Establishment of new EOF/BOF and IF with matching capacity of LRF & CCM (2.2 MTPA) , New Sinter Plant (1.2 MTPA), New Coke Oven Plant (0.7 MTPA), New Blast furnace (1250 m³ size)-1.5 MTPA, New Slab/Rolling Mill (Long/Flat)-(2.0 MTPA) expansion of Ferro Alloy with AOD (45000 TPA to 90,000 TPA), Oxygen Plant 24 TPD to 674 TPD. The total area of the plant after the proposed expansion will be 197.936 ha [Existing Plant land – 141.15 ha, Proposed additional land – 56.786 ha]. The total land is are under the possession of the company. The project cost for proposed expansion project is Rs. 2865 Cr.

2.1 Raw Material Requirement

The following will be the raw material requirement for the proposed expansion project:

Table E-4: Raw Material Details

Sr. No.	Raw material	Existing (TPA)	Expansion (TPA)	Total (TPA)	Source	Distance from site (km)	Mode of Transportation
Iron Ore Beneficiation Plant (20,00,000 TPA)							
1	Iron Ore	20,00,000	-	20,00,000	Own Mines/ Orissa	160/400	By Rail & Road (covered Trucks)
Palletizations Plant (14,00,000 TPA)							
1.	Beneficiated Iron Ore	14,28,000	-	14,28,000	Captive	--	Conveyor
2.	Pulverized Fuel	49,000	-	49,000	Local Market	100-150	By Road (Covered Trucks)

3.	Bentonite	11,200	-	11,200	Local market	100-150	By Road (covered Trucks)
4.	limestone	21,000	-	21,000	Local Market	100-150	By Rail & Road (covered Trucks)
Sinter plant (12,00,000 TPA)							
1.	Iron Ore Fines	-	10,20,000	10,20,000	Own Mines/Orissa	160/300	By Rail & Road (covered Trucks)
2.	Coke Breeze	-	78,000	78,000	Own Generation	--	By truck / Conveyor
3.	Limestone	-	1,44,000	1,44,000	Local Market	100-150	By Rail & Road (covered Trucks)
4.	Dolomite	-	96,000	96,000	Local Market	100-150	By Rail & Road (covered Trucks)
5.	Burnt Lime	-	6000	6000	Local market	100-150	By truck / Conveyor
6.	Mill Scale	-	30,000	30,000	Own Generation	--	By truck / Conveyor
7.	Flue Dust	-	18,000	18,000	Own Generation	--	By truck / Conveyor
8.	Sinter Return	-	1,80,000	1,80,000	Own Generation	--	By truck / Conveyor
9.	Sinter Dedusting Fines	-	12,000	12,000	Own Generation	--	By truck / Conveyor
Producer Gas Unit (Nm³/hrs.)							
Sr. No.	Raw material	Existing (TPA)	Expansion (TPA)	Total (TPA)	Source	Distance from site (km)	Mode of Transportation
1	Coal	49980.5	49980.5	99,961	Captive Mines/SECL	200/150	By Rail & Road (covered Trucks)
2	Steam	3583	3583	7,166	Captive	--	-
3	Air	111197	111197	2,22,394			
Coke Oven							
1	Coking Coal	-	9,45,000	9,45,000	Imported (South Africa, Indonesia, Australia)	500	By Ship, By Rail, By Road (covered Trucks)
Blast Furnace (15,00,000 TPA)							
1	Iron Ore/Pellets	-	5,04,000	5,04,000	Own Mines/Captive	160	By Rail & Road /Conveyor (covered Trucks)
2	Sinter	-	20,16,000	20,16,000	Own Generation/ Local market	-	Closed Conveyor/By Rail & Road
3	Coke	-	5,70,000	5,70,000	Own Generation	-	By truck/Conveyor
4	Coal dust	-	2,40,000	2,40,000	Own Generation	-	By truck/Conveyor
5	Air Blast (5% O ₂ Enriched)	-	21,69,000	21,69,000	Own Generation	-	-
SMS THROUGH EOF ROUTE							
1	DRI	-	2,47,013	2,47,013	Captive	-	By truck/Conveyor
2	Hot metal from BF	-	15,00,000	20,93,110	Ladle	-	

	Hot metal from IF		6,75,000		-	-	
3	Steel Scrap		1,23,506	1,23,506	Local Market	100-150	By truck
4	Fluxes		1,30,006	1,30,006	Local Market	100-150	By truck
5	Ferro Alloys		32,501	32,501	Captive	-	By truck
SMS THROUGH IF ROUTE							
1	Sponge Iron	-	6,87,825	6,87,825	Own Generation	-	By truck/Conveyor
2	Pig Iron	-	28,350	28,350	Own Generation	-	By truck
3	MS Scrap	-	70,875	70,875	Local Market	100-150	By truck
4	Ferro & non-Ferro Alloys	-	6750	6750	Own Generation	-	By truck
For DRI Kilns (Sponge Iron)-8,00,000 TPA							
1	Iron Ore	10,20,000	3,40,000	13,60,000	Barbil, Orissa NMDC, Chhattisgarh /Captive Mines	~ 500 Kms	By Rail/Road Through Covered Trucks
OR							
	Pellet	8,70,000	2,90,000	11,60,000	Own generation	-	-
2	Non-Coking Coal (100%)	6,00,000	2,00,000	8,00,000	Captive Mines/SECL	200/150	By Rail & Road (Through covered Rakes/trucks)
OR							
	Coal Imported (100%)	5,10,000	1,70,000	6,80,000	Indonesia / South Africa / Australia	~ 600 Kms (from vizag Port)	Through sea route, & by rail/road
3	Dolomite	30,000	12,000	42,000	Chhattisgarh	~ 100 Kms	By road (Through covered trucks)
Raw Material for Power Plant (AFBC/CFBC)							
a	Dolochar	18,605	2,37,720	2,56,325	In plant generation/ Local market	~ 100 Kms	through covered conveyors/By road through covered Trucks
	Indian Coal	52,961	6,76,724	7,29,685	SECL Chhattisgarh / MCL Odisha	~ 500 Kms	By road (Through covered trucks)
Raw Material for SLABS (FROM SMS) - 2123440 TPA							
1	Liquid Metal from Furnace	-	21,66,780	21,66,780	Own generation	-	-
ROLLING MILL (2000000 TPA)							
1	Semi-Finished Product from EOF-CCM		21,23,440	21,23,440	Own generation	-	-
FERRO ALLOYS PLANT (FERRO MANGANESE/SILICO MANGANESE) HC- 2X9 MVA - 45000 TPA							
1	Manganese	81,000	81,000	1,62,000	Balaghat	~ 500	By Road (Covered

					(M.P.) Imported from South Africa	Kms. ~ 480 Kms. (from Vizag Port)	Trucks) From Vizag Port by Road (Covered Trucks)
2	Coke	22,050	22,050	44,100	Chhattisgarh / Bihar Imported from Australia, China	~ 100 Kms. ~ 480 Kms. (from Vizag Port)	By Road (Covered trucks) From Vizag Port by Road (Covered Trucks)
3	Coal	0	0	0			
4	Fluxes	2500	2500	5000			
AOD Converter-FeMn(MC)/SiMn(HC) -90000 TPA							
1	FeMn (HC)	45,000	45,000	90,000	Balaghat (M.P.) Imported from South Africa	~ 500 Kms. ~ 480 Kms. (from Vizag Port)	By Road (Covered Trucks) From Vizag Port by Road (Covered Trucks)
2	SiMn(HC) Solid	5000	5000	10,000	In house generation	-	By Road (Covered trucks)
3	Burnt Lime	2500	2500	5000			
4.	Calcined Dolomite	1000	1000	2000			
5	Flour Spar	400	400	800			
6	FeSi	100	100	200			
7	Radex	100	100	200			

2.2 Manufacturing Process

Iron Ore Beneficiation Plant

Very low-grade Iron ore cannot be used in metallurgical plants and needs to be upgraded to increase the iron content and reduce the gangue content. Iron ore is upgraded to higher iron content through concentration. Iron ore is being beneficiated all around the world to meet the quality requirement of Iron and Steel industries. However, each source of Iron ore has its own peculiar mineralogical characteristics and requires the specific beneficiation and metallurgical treatment to get the best product out of it.

Manufacturing of Pellets

The Pelletization process consists of forming green balls out of a very finely ground mixture of Iron ore fines, Limestone, coke and a binder like bentonite. These balls are then fired in an indurating furnace to get hardened balls called pellets. The hot air from kiln and cooler is used in the travelling grate utilizing and recovering maximum heat from waste gases.

Existing Coal gasifier of $1 \times 17000 \text{ Nm}^3/\text{hr}$ & $1 \times 5500 \text{ Nm}^3/\text{hr}$ supplies producer gas to the pellet plant. Alternatively, furnace oil is also used in pellet plant along with producer gas (fuel gas).

Manufacturing of Sinter

Sintering is a process agglomeration of fines into solid blocks, in the process of sintering iron ore fines / flue dust / ESP Dust / BF return etc. along with Dolomite, Coke Breeze and limestone are mixed and is fused at a temperature ranging between 900 to 950°C . These fines get converted into blocks known as Sinter. It is proposed to manufacture $12,00,000$ TPA to meet the in-house requirement of blast furnace.

Manufacturing of Coke

Coke is the pyrolysis product of coking coal, carried out inside a series of oven at temperature of 1200 deg C. Coal cake will be formed by drawing required quantity from coal bunker, through hydraulic stamping on the charging plate. This is taken to Oven by Pusher cum charging car. it will be kept in the Oven for 70 hrs. Coke mass formed will be pushed into the quenching car on other side through Pusher and discharged into hopper after cooling. Coke lumps formed will be cut to size in coke cutter and will be passed through screens.

Manufacturing Process of Pig Iron / Hot metal through Blast Furnace

The blast furnace shop will comprise of one furnace of 1250 m^3 working volume. The blast furnace is envisaged to operate with sized lump iron ore/pellets, coke, coal dust, Sinter and additives. The hot metal produced will be cast at pig casting machines to produce cold pigs. The liquid slag will be granulated at cast house granulation unit. The BF top gas will be cleaned in dust catcher and gas cleaning system and distributed to the stoves, burners for runner drying, boilers for process and process steam supply. The excess gas will be supplied to power plant. Total production capacity will be 1.5 MTPA of hot metal.

Manufacturing process of Sponge Iron (DRI)

Refractory lined rotary kilns will be used for reduction of iron ore in solid state. A central Burner located at the discharge end will be used for initial heating of the kiln. Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the Sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre-heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the

moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000°C enters the reduction zone. Temperature of the order of 1050°C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

This hot material will be transferred to Heat exchanger. In Heat exchanger the material will be cooled to 100°C. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through magnetic separators and stored in separate bins. The hot flue gases will be taken to a Waste Heat Recovery Boilers and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.



Power Generation

i) Waste Heat Recovery Boiler

The hot flue gases from DRI kilns will pass through waste heat recovery Boilers to recover the heat and to generate 1x16 MW from proposed 1x600 TPD DRI Kilns (3x16 MW from existing 3x600 TPD DRI Kiln). The gases after heat recovery will pass through ESPs and then discharged through chimneys into the atmosphere for effective dispersion of emissions into the atmosphere through stacks of adequate height.

ii) CFBC Power Plant

Coal (Imported / Indian) along with dolochar will be used as fuel in CFBC/AFBC Boilers to generate 115 MW of electricity. The flue-gases will be treated in high efficiency ESP and then discharged through a stack of adequate height into the atmosphere.



Steel Melting Shop

In Steel Melting Shop (SMS), Sponge Iron will be melted along with melting scrap and fluxes to make liquid steel which is then refined in Ladle Refining furnace and then poured into CCM to get billets. The SMS will consist of Induction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). 8 nos. of Induction Furnaces (30 T capacity each) are proposed to install for production of 6,75,840 TPA.

Manufacturing of Rolled products through Rolling Mill

The Hot Billets produced in Induction furnaces will be directly sent to Rolling Mill to produce Rolled Products (Long/Flat) of 2.0 MTPA capacity.

2.3 Power Requirement & Supply

Existing power requirement of 37.5 is obtained from captive WHRB power plant and Chhattisgarh State Power Generation Company Limited (CSPGCL). The power requirement for the proposed project is estimated as 277.5 MW, out which 269 MW will be obtained from CPP& WHRB and additional from CSPDCL. In addition to this total 2 Nos of 1000 kVA DG sets are proposed for emergency backup.

Table E-5: Power Requirement

Sl. No.	Unit	Power Requirement		
		Existing plant	Expansion	After expansion
1.	Sponge Iron Plant	3.1 MW	2 MW	5.1 MW
2.	SMS	-	111 MW	111 MW
3.	Coke Oven Battery	-	2 MW	2 MW
4.	Sintering Plant	-	12 MW	12 MW
5.	Blast Furnace	-	21 MW	21 MW
6.	Oxygen Plant		21 MW	21 MW
7.	Pelletization Plant	7.5 MW	-	7.5 MW
8.	Ferro Alloys Plant with AOD	17.5 MW	17.5 MW	35 MW
9.	Iron Ore Beneficiation Plant	5 MW	-	5 MW
10.	Rolling Mill (Rolled Products)	-	35 MW	35 MW
11.	Power Plant - WHRB	2.6 MW	8.5 MW	11.1 MW
12.	Power plant - FBC	-	10 MW	10 MW
13.	Pipe Mill	1.8 MW	-	1.8 MW
	Total	37.5 MW	240 MW	277.5 MW

2.4 Water Requirement

Existing fresh water requirement is 6578KLD, water requirement is being obtained from Shivnath (Seonath) River surface water drawl permission to draw 5.4 MCM (16363 KLD) of water from WRD. The water requirement after proposed expansion project is estimated as 24,871 KLD, out of which 23,468 KLD will be fresh water requirement will be obtained from surface water and the remaining requirement of 1403 KLD will be met from the reuse of water. The permission for drawl of Surface/Ground water will be obtained from concerned authority. The details of water requirement for different purposes are presented in **Table-E- 6**.

Table .E-6: Water Requirement (KLD)

Products	Existing Water Requirement	Proposed Water Requirement	Water Requirement after Expansion
Sponge Iron Plant	450	300	750
Palletization Plant	840	-	840
Iron Ore Beneficiation Plant	1285	-	1285
Sinter Plant	-	690	690
Coke Oven Battery	-	505	505
Blast Furnace	-	3298	3298
Ferro Alloys	180	180	360
Captive Power Plant	-	1380	1380
Oxygen Plant 20,500 m ³ /hr	20	420	440
EOF/BOF (Refining)	-	5330	5330
Induction Furnace	-	930	930
Rolling Mill/Slab Mill	-	3236	3236
Power Plant WHRB	2880	1164	4044
Utilities including domestic use	200	180	380
Producer Gas Plant #	132	131	263
Dust Suppression #	86	124	210
Fly Ash Bricks Plant #	250	-	250
Ash Handling #	95	95	190
Green belt #	255	235	490
Total Requirement	6673	18198	24871 (Fresh 23468, Reused 1403)

Note # Treated water

2.5 Project cost

The project cost of the project is estimated as Rs. 2865 Crores.

2.6 Land Requirement

Shri Bajrang Power and Ispat Limited is an existing plant situated at Village - Tandwa & Kundru, Tehsil- Tilda, District- Raipur, Chhattisgarh. Existing plant is located in 141.15Ha of land. Proposed expansion will be taken up in partly in the existing land and partly in the 56.786 ha of land adjacent to the existing plant. Total land after proposed expansion will be 197.936Ha. No alternative site has been considered, as the proposed expansion will be taken up partly in the existing plant premises and partly in the land adjoining the existing plant. The land use and breakup details are presented in **Table-E- 7**.

Table.E-7: Land Area Breakup

Sr. No	Particulars	Area (SQM)	%	
A.	Existing Plant area	518383	26.2%	
1.	Kiln 1 & 2 WHRB/TG Building	65000		
2.	Pellet Plant	44320		
3.	Beneficiation Plant	45000		
4.	Pipe Plant	43000		
5.	Railway siding	47817		
6.	RMHS	122000		
7.	Tailing Pond	34190		
8.	Reservoir	34686		
9.	Batching Plant	23400		
10.	Bricks Plant	877		
11.	Automobile	2000		
12.	Diesel Pump	1400		
13.	Sub station	3400		
14.	Mist Cooling	11225		
15.	DM Plant	1450		
16.	Admin/security Others	5500		
17.	Security & Others	2000		
18.	Oxygen Plant	3300		
19.	Wagon Tippler	2300		
20.	AOD	3800		
21.	Kiln 3	10318		
22.	Galvanizing Plant	8400		
23.	Ferro 2	3000		
B.	Proposed Plant area	348100	17.6	
1.	Sinter Plant	48000		
2.	Coke Oven	115500		
3.	Future CDQ	51826		
4.	Blast Furnace (1250m3)	71000		
5.	EOF/BOF (Refining)	60000		
6.	Induction Furnace			
7.	Rolling Mill			
8.	Sponge Iron Division	20000		
9.	Power (WHRB)	3000		
10.	Power (CFBC/AFBC)	8000		
11.	Ferro Alloys	18600		
12.	Oxygen Plant	4000		
C.	Greenbelt area	Existing	480016	33
		Proposed	173172.8	
D.	Internal roads (existing & proposed)	86050	4.3	
E.	Open Area	373638.2	18.9	
	Total (A+B+C+D+E)	1979360	100	

2.7 Employment Generation (Direct & Indirect) Due to the Project.

SBPIL had total employment strength of 2500 number. This includes contractual employment to the tune of 500 Nos. Additional 3000 Number (2350 regular as well as contractual 650) of man power will be required to meet the expansion projects. The same will be hired locally in phased manner. The company is committed to provide 90% of employment (Skilled as well as unskilled) to the local.

2.8 Key pollution concerns

S. No	Source	Control Equipment	Emission at the outlet
1.	DRI kiln with WHRB	Electro Static Precipitators (ESP) (high performance rigid electrodes with transformer)	PM <30 mg/Nm ³
2.	Induction Furnaces with CCM	Fume Extraction system with PTFE bag filters	PM <30 mg/Nm ³
3.	Ferro Alloy Plant	4th hole extraction & heat exchanger with Pulse jet Bag filters	PM <30 mg/Nm ³
4.	Blast Furnace	Gas Cleaning Plant Bag Filters in stock & cast house, TRT (top pressure recovery turbine)	PM < 10 mg/Nm ³
5.	Pellet Plant	ESP in Indurating Furnace Bag Filters for Plant de-dusting	PM < 30 mg/Nm ³
6.	AFBC Boiler	Electro Static Precipitators (ESP) (High Performance rigid electrodes)	PM < 30mg/Nm ³
		Limestone will be used as bed material and act as sulphur absorbent. Lime dosing will also be done	SO ₂ < 100 mg/Nm ³
		Combustion temperature will be around 800-850 ⁰ C, which is not conducive for thermal NOx formation. Low NOx burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided.	NOx < 100 mg/Nm ³
7.	Sinter Plant	ESP in Main Sintering Machine and Plant De-dusting	PM < 30 mg/Nm ³
8.	Coke Oven Plant	-	PM < 30 mg/Nm ³
9.	Rolling Mill	BF gas after passing through Gas Cleaning System will be used in Rolling Mill and will be vented through Stack of suitable heights	PM < 30 mg/Nm ³

Note: Apart from the above Fume Extraction System with bag filters, dust suppression system, covered Conveyers, mechanical dust sweepers, Wheel washing at entry and exit gates etc. will also be provided.

3.0 DESCRIPTION OF BASELINE ENVIRONMENT

Baseline data was generated during pre-monsoon season from 1st March 2024 to 31st May 2024. Baseline environmental studies were conducted at project site along with 10 km radial distance from the project site. Baseline environmental quality data for various environmental component like Air, Noise, Water, Land, Biological Environment and Socio-Economic.

A. Air Quality

Ambient air quality was monitored for PM_{2.5}, PM₁₀, SO₂, NO_x & CO, O₃, Arsenic, Nickel, Lead, Ammonia, Benzene & BaP at 10 stations including project site. The following are the concentrations of various parameters at the monitoring stations:

Table E-8: AAQ DATA SUMMARY

Parameter	Concentration
PM ₁₀	47.5 µg/m ³ to 74.9 µg/m ³
PM _{2.5}	28.6 µg/m ³ to 43.6 µg/m ³
SO ₂	10.3 µg/m ³ to 22.8 µg/m ³
NO ₂	12.2 µg/m ³ to 32.6 µg/m ³
CO	510 µg/m ³ to 1340 µg/m ³
Other Parameters such as O ₃ , Arsenic, Nickel, Lead, Ammonia, Benzene, BaP was found BDL	

B. Surface Quality

Water samples from 8 surface water bodies have been collected and analysed as per IS standards. Based on test result data comparison study, The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

- pH of the surface water samples collected was in the range of 6.8– 7.8
- The Total dissolved solids in the samples were in the range of 210-680 mg/l.
- Total Hardness in the samples were in the range of 175-290 mg/l.
- Chlorides concentration was found to be in the range of 48-310 mg/l.
- Total Coliforms Organism MPN/100ml -120-290
- Dissolved oxygen (DO) refers to the amount of oxygen (O₂) dissolved in water. Because fish and other aquatic organisms cannot survive without oxygen, DO is one of the most important water quality parameters. The reported value of range of 4.0-5.3 mg/l
- Biochemical Oxygen Demand (3 days at 27°C) – 2.0 to 3.0 mg/l
- COD ranges from 6.8 -48 mg/l
- Heavy metal concentrations in all the samples were found to be well within the limits

C. Ground Water

8 Nos. of ground water samples from open wells / bore wells were collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

- pH of the ground water samples collected was in the range of 6.9– 7.6

- Total Dissolved Solids in the samples was in the range of 419-490 mg/l
- Total hardness was found to be in the range of 207-274 mg/l.
- Chlorides concentration was found to vary between 225-284mg/l.
- The fluoride concentration was found to be in the range of 0.20 - 0.40mg/l.
- Sulphate was found in the range of 110-152 mg/l.
- Heavy metal concentrations in all the samples were found to be well within the limits.

D. Noise Quality

Noise levels were measured at 10 locations during day time & Night time. The Maximum Noise (day) value was observed 68.3 dB(A) and the minimum noise (day) value was observed 45.5 dB(A). The Maximum Noise (night) value was observed 63.9 dB(A) and the minimum noise (night) value was observed 38.7 dB(A).

E. Soil Environment

- The bulk density of the soil in the study area ranged between 1.14 - 1.6 gm/cm which indicates favourable physical condition for plant growth.
- pH is found to be neutral 7.2 - 7.64 in reaction. Based on the pH values, soil nature in the study area is found to be neutral to slightly alkaline. As based on result of available concentration of major nutrients fertility status of soil with respect to NPK value is found to be in the range of 205.0- 263.1 kg/ha (better), 62-88 kg/ha (sufficient) and 92.8- 347 kg/ha (Better) respectively.
- Organic carbon was found in the range of 0.47% - 0.73%

F. Biological Environment

No schedule I species have been reported from the study area. The species are duly confined in the following Schedules i.e II, III, IV and V of the Indian Wildlife (Protection) Act,1972. Also, there is no presence of endangered flora as per Botanical Survey India records in the study area.

No national park or wildlife sanctuary or biosphere reserve is present in the study area. No endangered species of flora and fauna is found in the study area.

G. Socio Economy

- Total Population of the villages in the Study area (10 Km radius) is 251167
- Sex Ratio (No. of females per 1000 Males) is 997

- The literacy rate in study area is 64.78%;

H. Land Use Land Cover Classification

The Land Cover classes and their coverage are summarized below:

S. No.	LU/LC Class	Area (Ha.)	Percentage
1	Settlement	4244.39	11.43
2	Industry	849.76	2.29
3	Water Bodies	417.46	1.12
4	Vegetation	227.99	0.61
5	Scrub Land	1570.01	4.23
6	Crop Land	4399.24	11.85
7	Forest	1937.2	5.22
8	Stone Quarry	258.01	0.69
9	Agricultural Land	23235.29	62.56
	Total Study Area	37139.35	100.00

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Prediction of impacts on air quality

The likely emissions from the proposed expansion project are PM₁₀, PM_{2.5}, SO₂ and NO_x. In the present case, predictions of Ground level concentrations have been carried out using ISCST -3 model.

The incremental GLC values of PM₁₀, PM_{2.5}, SO₂ and NO_x, CO around the project site is presented as isopleths in Chapter-4.

Table -E-9: Net Resultant Maximum Concentrations

Item	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	NO _x (µg/m ³)	SO ₂ (µg/m ³)	CO (µg/m ³)
Maximum baseline conc. in the study area	74.9	43.6	32.6	22.8	1290
Maximum predicted incremental rise in concentration due to proposed project (Point Sources)	5.52	3.85	18.52	16.25	----
Maximum predicted incremental rise in concentration due to proposed project (Vehicular emissions)	3.69	2.32	6.72	---	4.52
Net resultant concentrations	84.11	49.77	57.84	39.05	1294.52

during operation of the proposed project					
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The net resultant Ground level concentrations during operation of the proposed expansion project are within the NAAQS. Hence, there will not be any adverse impact on air environment due to the proposed project.

The net resultant Ground level concentrations during operation of the expansion project are within the NAAQS. Hence there will not be any adverse impact on air environment due to the proposed expansion project.

B. Prediction of impacts on Noise quality

The major sources of noise generation in the proposed expansion project will be STG, Boilers, Compressors set, etc. Acoustic enclosures will be provided to the Turbines. All machinery will be manufactured keeping in view of the MOEF&CC/OSHA standards on Noise levels. The ambient noise levels will be within the standards prescribed by MoEF&CC i.e. the noise levels will be less than 75 dBA during day time and less than 70 dBA during night time. After expansion 653188.8 SQM (65.318 ha) i.e.33 % of land is envisaged for greenbelt out of the total 197.936 ha will be developed for green area. Hence, there will not be any adverse impact due to noise on population in surrounding areas due to the proposed expansion project.

C. Prediction of impacts on Water Environment

The implementation of proposed expansion project may have some impact on the water environment. The impact may be on the source of water in the form of depletion of water resources of the area and in the form of deterioration of quality of natural water resources due to discharge of plant effluent.

100% of waste water will be recycled and Zero discharge condition will be maintained.

Units	Existing waste water generation (KLD)	Proposed waste water generation under expansion plan (KLD)	Total waste water generation after expansion (KLD)	Disposal/Management
Industrial				
Sponge Iron Plant	88	44	132	There will be no wastewater discharge from the DRI Unit, as closed-circuit cooling system will be adopted.
Palletization Plant	6	-	6	Effluent from Pellet plant,

Iron Ore Beneficiation Plant	62	-	62	Sinter, I/O Beneficiation, SMS, Ferro Alloys, Blast Furnace, Power Plant, Oxygen plant are being/will be treated in Neutralization-Pit/ETP will be used in Ash Handling, dust suppression, and greenbelt development. Air Cooled condensers will be provided in the power plant, which will be reduce the water consumption significantly. Hence wastewater generation will also be minimized
Sinter Plant	-	9	9	
Coke Oven Battery	-	0	0	
Blast Furnace	-	31	31	
Ferro Alloys	2.5	2.5	5	
Captive Power Plant	-	144	144	
Power Plant WHRB	302	122	424	
Oxygen Plant 20,500 m ³ /hr	0.5	9.5	10	
EOF/BOF (Refining)	-	160	160	
Induction Furnace	-	50	50	
Rolling Mill/Slab Mill	-	80	80	Effluent from Rolling mills will be sent to oil separator followed settling tank for further treatment
Sub Total of A	461	652	1113	
B. Domestic				
Utilities including domestic use	160	144	304	Sanitary waste water is being/will be treated in STP and after treatment it will be utilized for greenbelt development.
Sub Total Of B	160	144	304	--
Total A+B	621	796	1417	--

D. Prediction of impacts Socio - Economic Environment

There will be certain upliftment in socio economic status of the people in the area & development of the area due to the proposed expansion project.

Due to this the economic conditions, the educational and medical standards of the people living in the study area will certainly move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

E. Prediction of Impacts on Land Environment

The effluent will be treated to achieve SPCB standards. Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB / SPCB norms. All solid wastes will be disposed / utilized as per CPCB /

SPCB norms. plantation will be developed as per guidelines. Hence, there will not be any adverse impact on land environment due to the proposed project.

F. Biological Environment

There is no ecological sensitive area like national park, sanctuary, biosphere reserve, within 10 km radial distance from the project site. No land involved in the project activities. Thus, no significant impact envisaged on biological environment. Existing plant is located over an extent of 141.15 Ha. out of this 34 % of the area i.e.48 Ha. has been developed with greenbelt. 119998 nos. plants are present in the existing premises. After expansion 65.318 ha i.e.33 % of land is envisaged for greenbelt out of the total 197.936 ha of land. It is proposed to plant another 40547 nos of plants as part of expansion. 23999 Nos of samplings will be planted as part of gap filling within the existing premises. Indigenous and broad leaf species for greenbelt development.

5.0 ENVIRONMENTAL MONITORING PROGRAM

Environmental Management Cell (EMC) will be set up to undertake routine environmental monitoring. Monitoring will be done to ensure compliance with the prescribed laws and standards. The Head of EMC will report to the Plant Head. Qualified staff will be recruited in EMC. Environmental monitoring of ambient air, stack emission, fugitive dust emission, noise levels, groundwater quality, surface water quality and soils will be carried out as per norms.

Table- E-10: Environmental Monitoring Programme

S. No	Particulars	Frequency of monitoring	Duration	Parameters required to be monitored
1	Ambient Air quality	CAAQMS Quarterly Once	Continuously 24 Hourly	PM _{2.5} , PM ₁₀ , SO ₂ , NO _x
2	Stack Monitoring	CEMS (all Stacks) Once in a month	-- --	PM, SO ₂ & NO _x
3	Fugitive emissions	Once in a Month	8 hours	PM
4	Meteorology	daily	Continuously	Temperature, Humidity, rainfall, wind direction & wind speed. Relative wind
5	Noise	Once in a month (Hourly)	Continuous for 24 hours with 1-hour interval	Equivalent noise level- dB (A)
6	Water quality in the area	Quarterly Once	Grab sampling	As per IS: 10500
7	Effluent at the inlet & outlet of the ETP	Once in a month	Composite sampling (24 hourly)	As per EPA Rules, 1996
8	Sanitary Wastewater (inlet & outlet of STP)	Once in a month	Composite sampling (24 hourly)	As per EPA Rules, 1996

9	Greenbelt	-	-	Number of plantation (Units), Number of Survived plants/trees, Number of poor plants/Trees
10	Environmental Audit	Once in year	-	With Respect to Environment Clearance, Consent conditions and ISO 140001.

6.0 ADDITIONAL STUDIES

No Rehabilitation and Resettlement is not involved in the proposed expansion project. Hence, no R & R study has been carried out.

Risk Assessment:

The assessment of risk in the proposed (expansion) project has been estimated for fire, explosion and toxicity and corresponding mitigation measures are suggested in the EIA/EMP report.

Hazard analysis involves the identification and quantification of the various hazards (unsafe conditions) that exist in the project site. On the other hand, risk analysis deals with the identification and quantification of risks occurring due to the plant equipment and personnel exposed, due to accident resulting from the hazards in the plant. The occupational and safety hazards and preventive measures, process hazards and their preventive measures, and storage hazards and preventing measures are provided in details in Chapter 7 of the EIA report.

The main objective of the risk assessment study is to determine damage due to major hazards having damage potential to life and property and provide a scientific basis to assess safety level of the facility. The secondary objective is to identify major risk in manufacturing process, operation, occupation and provide control through assessment and also to prepare on-site, off site plans to control hazards.

The assessment of risk in the proposed expansion project has been estimated for material handling, movement of Trucks/Tippers, Dust hazards, Hazards, shock hazards, etc. and corresponding mitigation measures are suggested in the EIA/EMP report.

7.0 PROJECT BENEFITS

During Construction Phase there would be direct job generation for at least 100 peoples and many more indirect jobs would be generated automatically. 3000 Number (2350 regular as well as contractual 650) of man power will be required to meet the expansion projects and additional many more indirect employments. Besides the production staff some more manpower shall be needed for administrative purposes. All

the labour/manpower will be hired from the local places. CSR activities will be done as per rules of Government of India. The Budgetary provision will be made as per norms.

8.0 ENVIRONMENTAL MANAGEMENT PLAN

A. Air Environment

The following are air emission control systems proposed in the proposed expansion project:

S. No	Source	Control Equipment	Emission at the outlet
1.	DRI kiln with WHRB	Electro Static Precipitators (ESP) (high performance rigid electrodes with transformer)	PM <30 mg/Nm ³
2.	Induction Furnaces with CCM	Fume Extraction system with PTFE bag filters	PM <30 mg/Nm ³
3.	Ferro Alloy Plant	4th hole extraction & heat exchanger with Pulse jet Bag filters	PM <30 mg/Nm ³
4.	Blast Furnace	Gas Cleaning Plant Bag Filters in stock & cast house, TRT (top pressure recovery turbine)	PM < 10 mg/Nm ³
5.	Pellet Plant	ESP in Indurating Furnace Bag Filters for Plant de-dusting	PM < 30 mg/Nm ³
6.	AFBC Boiler	Electro Static Precipitators (ESP) (High Performance rigid electrodes)	PM < 30mg/Nm ³
		Limestone will be used as bed material and act as sulphur absorbent. Lime dosing will also be done	SO ₂ < 100 mg/Nm ³
		Combustion temperature will be around 800-850°C, which is not conducive for thermal NOx formation. Low NOx burners with 3-stage combustion, flue gas recirculation and auto combustion control system will be provided.	NOx < 100 mg/Nm ³
7.	Sinter Plant	ESP in Main Sintering Machine and Plant De-dusting	PM < 30 mg/Nm ³
8.	Coke Oven Plant	-	PM < 30 mg/Nm ³
9.	Rolling Mill	BF gas after passing through Gas Cleaning System will be used in Rolling Mill and will be vented through Stack of suitable heights	PM < 30 mg/Nm ³
Note: Apart from the above Fume Extraction System with bag filters, dust suppression system, covered Conveyers, mechanical dust sweepers, Wheel washing at entry and exit gates etc. will also be provided.			

Dust Suppression System

Water sprinklers will be provided at the unloading areas of the raw materials for dust suppression. Dust suppression system will be provided with plain water - comprising of piping network, valves, pumps, instrumentation & control, water tank etc.

Internal Roads

All internal roads will be asphalted to prevent the fugitive dust emission due to vehicular movement.

Interlocking System

All ESPs will have interlocking system. Whenever the ESP fails, there will be no production in the unit till the ESP is rectified.

B. Water Environment

Table-E- 11: Waste water Generation (KLD)

Units	Existing waste water generation (KLD)	Proposed waste water generation under expansion plan (KLD)	Total waste water generation after expansion (KLD)	Disposal/Management	
Industrial					
Sponge Iron Plant	88	44	132	There will be no wastewater discharge from the DRI Unit, as closed-circuit cooling system will be adopted.	
Palletization Plant	6	-	6	Effluent from Pellet plant, Sinter, I/O Beneficiation, SMS, Ferro Alloys, Blast Furnace, Power Plant, Oxygen plant are being/will be treated in Neutralization-Pit/ETP will be used in Ash Handling, dust suppression, and greenbelt development. Air Cooled condensers will be provided in the power plant, which will be reduce the water consumption significantly. Hence wastewater generation will also be minimized	
Iron Ore Beneficiation Plant	62	-	62		
Sinter Plant	-	9	9		
Coke Oven Battery	-	0	0		
Blast Furnace	-	31	31		
Ferro Alloys	2.5	2.5	5		
Captive Power Plant	-	144	144		
Power Plant WHRB	302	122	424		
Oxygen Plant 20,500 m ³ /hr	0.5	9.5	10		
EOF/BOF (Refining)	-	160	160		
Induction Furnace	-	50	50		
Rolling Mill/Slab Mill	-	80	80		Effluent from Rolling mills will be sent to oil separator followed settling tank for further treatment
Sub Total of A	461	652	1113		
B. Domestic					
Utilities including domestic use	160	144	304	Sanitary waste water is being/will be treated in STP and after treatment it will be utilized for greenbelt development.	
Sub Total Of B	160	144	304	--	

Total A+B	621	796	1417	--
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C. Noise Environment

Major noise-generating source will be machinery and equipment. The proposed equipment of the proposed expansion plant would be designed for noise levels not exceeding 75 dB (A). In general, the following methods will be adopted to control the noise pollution.

- The major noise generating sources in the plant will be STG, boiler, feed pumps, steam blowing from boiler.
- Acoustic enclosures will be provided to STG
- Quench water Silencer will be provided to prevent the noise during steam blowing.
- All machinery will be manufactured as per MoEF&CC/OSHA & other international standards on noise levels.
- The noise levels will be confined to the working zones of the plant.
- Ear plugs will be provided to all employees who will enter into the noise prone areas.
- Community noise levels are not likely to be affected due to the proposed thick green belt and attenuation due to the physical barriers.
- The ambient noise levels will be in accordance with MoEF&CC norms i.e. ambient noise levels will be < 75 dBA during daytime and < 70 dBA during night time.

D. Land Environment

The wastewater generated from the proposed project will be treated in the Effluent Treatment Plant to comply with the SPCB standards and will be used for dust suppression, ash conditioning and for greenbelt development. All the required Air emission control systems will be installed and operated to comply with SPCB norms. Solid wastes will be disposed off as per norms. Extensive greenbelt will be developed in the plant premises. Desirable beautification and landscaping practices will be followed. Hence there will not be any impact due to the proposed expansion project.

Table -E-12: Solid waste generation and disposal

S. No	Waste	Process where the waste generated	Existing (TPA)	Proposed expansion proposal (TPA)	After Proposed expansion Proposal (TPA)	Management
1.	Tailings	I/O Beneficiati on plant	6,00,000	-	6,00,000	Taken to filter press & recovered the water. Cake of tailing are stored in tailing yard & it is also given to cement plants/ sinter plants/ ceramic units.

S. No	Waste	Process where the waste generated	Existing (TPA)	Proposed expansion proposal (TPA)	After Proposed expansion Proposal (TPA)	Management
Sinter plant						
2.	Sinter Return	Sinter plant	-	1,80,000	1,80,000	Reused in the process
3.	Sinter Dedusting Fines removed	Sinter plant	-	12,000	12,000	will be reused in Sinter plant
Coke Oven						
4.	Coke Dust	Coke Oven	-	28,350	28,350	will be reused in Sinter plant
Blast Furnace						
5.	BF Slag	BF	-	4,79,000	4,79,000	will be sold to Cement Grinding unit.
6	Dust Removed from Primary dust catchers & BF gas cleaning	BF	-	29,916	29,916	will be reused in sinter plant.
7	BF Gas	BF	-	33,63,432	33,63,432	utilized for Power generation/ fuel of Reheating Furnace
Sponge Iron Plant						
8.	Char	Sponge Iron Plant	60,000	4,000	1,00,000	is being/will be used in proposed FBC power plant as fuel.
9.	ESP dust	Sponge Iron Plant	27,000	9,000	36,000	is being/will be used in Brick Manufacturing
10.	Bag Filter Dust, scrapper etc.	Sponge Iron Plant	9,000	3,000	9,000	will be used in road levelling areas & utilized in the proposed brick manufacture.
11.	Kiln Accretion	Sponge Iron Plant	3,600	1,200	4,800	will be utilized in the land filling Brick Manufacturing Unit
12.	Coal Fines from RM handling	Sponge Iron Plant	27,000	9,000	3,6000	will be reused in Sinter plant
SMS THROUGH EOF ROUTE						
13.	SMS Slag	SMS	-	2,16,678	2,16,678	Slag from SMS will be crushed and iron will be recovered & then remaining non - magnetic material being inert by nature will be used as

S. No	Waste	Process where the waste generated	Existing (TPA)	Proposed expansion proposal (TPA)	After Proposed expansion Proposal (TPA)	Management
						sub base material in road construction.
14.	Bag Filter dust	SMS	-	43,335	43,335	Flue dust to be recycled back to pellet plant/sinter plant
Ferro Alloy						
15.	AOD Slag	AOD	6,500	6,500	13,000	As raw material for Silico-manganese
16.	Ferro Manganese Slag/ Silico Manganese Slag	Ferro Alloy	26,000	26,000	52,000	Ferro manganese slag will be used as raw material for Silico-manganese and silico Manganese Slag will be given to for Road construction
Producer Gas Unit						
17.	Tar	Producer Gas Unit	2999	2999	5,998	Sold to Authorized Coal tar processing units, used in reheating furnace as fuel.
18.	Ash	Producer Gas Unit	14994	14994	29,988	For road construction and low laying area.
19.	Phenol water	Producer Gas Unit	4,168	4,168	8336	quenching on ABC chamber of DRI Kiln
Rolling Mill						
20.	Scrap (End cuts, Baby coils etc)	RM	-	42,468	42,468	will be reused in SMS
21.	Mill Scale	RM	-	21,236	21,236	will be reused in Sinter plant
Slabs (From SMS)						
22.	Scrap	-	--	30,598	30,598	will be reused in SMS
23.	Scale	-		12,742	12,742	are being / will be reused in Sinter plant
ERW Pipe Plant						
24.	Scrap	ERW Pipe plant	25,000	-	25,000	will be reused in SMS
Power Plant						
25.	Bottom & Fly Ash from Char (60% Ash)	Power Plant	-	1,47,200	1,47,200	Is being/Will be utilized in the existing Brick

S. No	Waste	Process where the waste generated	Existing (TPA)	Proposed expansion proposal (TPA)	After Proposed expansion Proposal (TPA)	Management
						manufacturing unit, Cement plant & road concrete
26.	Bottom & Fly ash from Indian Coal fines (40% Ash)	Power Plant	-	2,78,928	2,78,928	is being/will be utilized in the existing Brick manufacturing unit, Cement plant & road concrete

Table E-13: Hazardous Waste & Its Management

Particular	Quantity (TPA)	Disposal Method
Zinc Ash	896	Sold to authorized recyclers
Waste Oil/Used Oil	2 KL/annum	Will be used as lubrication of belt conveyors/given to authorized recycler having authorization from competent authority.
Zinc Dross	462	Reused / given to authorized recycler having authorization from competent authority.
Zinc Blown	92	Reused / given to co processing to Cement plant etc.
ETP sludge	300	Will be given to cement plant

Table E.14: MUNICIPAL SOLID WASTE GENERATION & ITS DISPOSAL

Type of Municipal solid waste	Existing (TPA)	Proposed Qty (TPA)	Total (TPA)	Proposed method of disposal
Canteen waste (Biodegradable)	99	118.8	217.8	Used in composting / Vermiculture Used as manure for greenbelt development within the premises
Non- Biodegradable	66	79.2	145.2	Used for landfill within the plant site to the extent possible

E. Green Belt Development

Existing plant is located over an extent of 141.15 Ha. out of this 34 % of the area i.e.48 Ha. has been developed with greenbelt.119998 nos. plants are present in the existing premises. After expansion 65.318 ha i.e.33 % of land is envisaged for greenbelt out of the total 197.936 ha of land. It is proposed to plant another 40547 nos of plants as part of expansion. 23999 Nos of samplings (@2500 sampling/Ha) will be planted as part of gap filling within the existing premises.

The following points will be considered for selection of plants species:

- Greenbelt absorbs both gaseous as well as particulate pollutants to a great extent. For absorbance of gases, the duration of the foliage should be longer.

- Characteristics of tree/plants including shapes of crowns considered necessary for effective removal of dust particles.
- Greenbelt/Plant species having good root system will be selected, so that soil erosion rates can be controlled significantly.

F. Cost for Environment Protection

S. No.	Component	Description	Existing		Proposed	
			Capital Cost in Crores	Recurring cost in Cr./Yr	Capital cost in Crores	Recurring cost in Cr./Yr.
1.	Air Pollution Control Equipment	Pollution Control Device (Bag filter, ESP) Fugitive Dust Control System, RCC/MS Stacks, Road Sweeping Machine, Sprinklers, Water Tankers, Pipelines, Pumps, etc.)	25.0	2.5	72	5.92
2.	Water Pollution Control	Upgradation of ETP, New STP & ETP, Garland drains, Settling ponds	10.0	1.0	24	2.24
3.	Solid Waste Management	Bottom Ash/Fly Ash Collection System	10.0	1.0	8	0.64
4.	Noise Pollution Control	Noise Pollution Control (Rubber Pads, Vibrators, Equalizers, etc.)	2.5	0.25	2	0.32
5.	Green Belt	Landscaping and Plantation	2.5	0.25	5.0	0.76
6.	Environmental Monitoring	CEMS for effluent, Environmental Lab Equipment's, PTZ cameras, etc.	2.5	0.25	4.3	0.8
		CEMS.CAAQMS, Environmental monitoring, Performance monitoring of APCS, etc.	2.5	0.25	5.0	0.4

7	Rain water harvesting /Recharge Structure	-	2.5	0.25	1.0	0.20
8.	Occupational Health & Safety, Fire Fighting System	OHC, Fire Tender, Ambulance, Fire Hydrant System Fire Extinguishers, etc	2.5	0.25	11.5	0.92
9.	Fire Safety Systems	-	-	-	11.2	0.3
Total			60	6.0	Rs. 144	Rs. 12.50

9.0 Conclusion

The operation of plant has significant positive impact on the socio-economic environment of the area which helps for development of this area including further development of physical infrastructure facilities. In the interest of improve the social conditions of the local habitants this project should be allowed after considering all the environment aspects.

The technology involved in the project is well proven and reliable. Many plants are operating all over the country in this pattern are successful. All equipment purchased shall be brand new & latest in model and will be purchased from reputed suppliers. For O&M of the plant, experienced Engineers/Technicians are available in the region. The region shall also be benefited from the project as there will be direct employment of people in the Steel plant. Preference will be given to the people of the state possessing requisite skill and qualification criteria. Also, there will be lot of scope for indirect employment of the people of the state in and around the project site like in transportation sector.

In view of the above the proposed expansion project of **M/s. Shri Bajrang Power and Ispat Limited**, is technically feasible and financially viable.
