

EXECUTIVE SUMMARY

EIA / EMP REPORT FOR

PROPOSED BROWN-FIELD EXPANSION (FROM 2.7 MTPA TO 3.42 MTPA GROSS HOT METAL) OF DURGAPUR STEEL PLANT of STEEL AUTHORITY OF INDIA LIMITED

LOCATED IN

WARD 34, DURGAPUR MUNICIPAL CORPORATION
FARIDPUR BLOCK, PASCHIM BARDHAMAN DIST.
WEST BENGAL

July, 2025

Project Proponent

Environmental Consultant



स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
DURGAPUR STEEL PLANT (DSP),
ISPAT BHAWAN,
DURGAPUR,
WEST BENGAL, PIN – 713203



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(A Govt. of India Enterprise)
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CERTIFICATE NO: NABET/EIA/24 - 27/RA 0342_Rev01)

Valid Up to: 09.02.2027



EXECUTIVE SUMMARY

1.0 INTRODUCTION

Durgapur Steel Plant of (DSP) of Steel Authority of India Ltd. (SAIL) at Durgapur in Paschim Bardhaman District of West Bengal is an existing Integrated Steel Plant which has been in operation since the late 1950s. The present EC sanctioned capacity of the plant is 2.7 MTPA of Gross Hot Metal (GHM), 2.5 MTPA of Crude Steel and 2.4104 MTPA of Saleable Steel.

Presently DSP produces steel via Coke Oven – Sinter – BF – BOF – Continuous Casting followed by processing of billets and blooms into saleable products. The plant current EC sanctioned capacity is 2.4104 MTPA of saleable steel, in the form of TMT Bars, Medium Structurals, Wheel and Axles. The plant also produces 0.214 MTPA of Cold Pigs for sale. The plant's by-products are Granulated Blast Furnace Slag (0.89 MTPA), Coal Tar (72000 TPA), Crude Benzol (16800 MTPA) and Ammonium Sulfate (19200 TPA). DSP also supplies 0.15 MTPA of Hot Metal to SAIL's adjacent Alloy Steels Plant for production of special steels.

DSP-SAIL has decided to further raise its capacity to 3.42 GHM, 3.09 MTPA Crude Steel and 2.914 MTPA Saleable Steel by installing some new units (notably a new 3000 m³ volume Blast Furnace, a 2.5 MTPA capacity iron ore pelletisation plant through PPP mode, a 0.4 MTPA capacity bar mill through PPP mode, a 1250 TPD Oxygen Plant through PPP mode), upgrading some of the existing units (notably the raw material handling & storage system, the two existing billet casters) and closing down / placing on standby some of the resource guzzling old units (notably Blast Furnace #2 & Blast Furnace #4). Some of the works sanctioned in the last EC but not yet implemented will also be completed during the current expansion programme (notably the 1.0 MTPA New Bar Mill). The entire expansion programme will be implemented on land owned by the company and in the company's possession. Raw Material Handling systems, Utility (water, power & gas) supply lines, roads, storm water drainage, sewerage network will be augmented and extended to the new units.

The expansion programme will be implemented on land owned by SAIL and in the company's possession (i.e. no land acquisition and resettlement & rehabilitation of land oustees involved).

Terms of Reference (ToR) for the EIA/EMP Studies for the proposed expansion project has been issued by MoEF&CC, New Delhi vide their letter no. IA-J/11011/492/2007-IA-II(IND-I) dated 18-06-2025.

2.0 PROJECT LOCATION

DSP is located in Ward 34 of Durgapur Municipal Corporation in Faridpur-Durgapur Block under Durgapur Sub-division of Paschim Bardhaman District in West Bengal, between 23°31'38" N to 23°33'45" N (Lat.) and 87°14'22" E to 87°16'19" E (Long.) on the banks of the Damodar river. The existing plant's present area is 600.00 hectare. The project site (DSP's existing premises) is covered in the Survey of India (SOI) Toposheet Nos. F45D2 & F45D6. DSP lies at between 74 & 86 m above mean sea level.

The present project envisages the expansion of an existing steel plant, with the proposed units being established within the premises of the existing facility which does not include any Forest Land. The entire land is owned by SAIL and is in the company's possession.

NH-19 (Kolkata to Agra National Highway via Bardhaman, Asansol, Dhanbad, Varanasi, Prayagraj, Kanpur) passes close to the northern boundary of DSP. The plant is linked to NH-19 by two approach roads, one exclusively for men and other for goods vehicles. There are two more entry points, one on the south-eastern side for personnel & goods vehicles and another on the western side, exclusively for personnel. The site is approximately 180 km by road NW of Kolkata, the state capital.

The nearest railway station is Waria Railway Station (on Eastern Railway's Howrah – Delhi B.G. Main Line) which is only ~50 m west of the plant boundary. DSP is linked to the national railway network through Andal Junction Railway Station located ~5.8 NW of the plant.

The nearest commercial airport is KaziNazrul Islam Airport, Andal located ~5.5 km north of DSP.

The nearest Major Port is Kolkata Dock System of Shyama Prasad Mookerjee Port which is ~190 km by road / rail. However DSP receives most of its imported raw materials through Haldia Dock Complex of Shyama Prasad Mookerjee Port which is ~285 km by road / rail.

There is no Biosphere Reserve, Ramsar Site, National Park, Wildlife Sanctuary or Eco-Sensitive Zone within 10 km of the plant. The nearest forest is Ukhra Reserve Forest, which has been converted into an Australian Acacia plantation, is about 8.5 km to the north. The Damodar River, a major river draining parts of Jharkhand and West Bengal flows ~1.2 km SE of the plant boundary. In addition, a perennial stream Tamla Nala flows ~60 m from the plant's north-eastern boundary. The project area is located in an area identified as "Severely Polluted Area" by CPCB.

3.0 PROJECT DESCRIPTION

Under the proposed expansion programme:

- A new 2.5 MTPA Pellet plant shall be installed through PPP mode
- A new 2.36 MTPA Hot Metal capacity Blast Furnace (BF#5) shall be installed. BF#2 shall be decommissioned & BF#4 shall be placed on standby.
- A new 0.4 MTPA Bar Mill shall be installed through PPP mode
- Another 1250 TPD capacity oxygen plant shall be installed through PPP mode
- Facilities in the Steel Melting Shop shall be upgraded and operational changes shall be implemented to enable processing additional hot metal
- The existing billet casters shall be upgraded
- Some of the facilities which have received EC but not implemented, notably the New 0.2 MTPA Micro-Pelleting /Briquetting plant and the 1.0 MTPA Bar Mill, shall be implemented
- Existing Raw Material Receipt, Storage & Handling facilities, water and power distribution network, finished product dispatch facilities and other infrastructure shall be suitably augmented / upgraded commensurate with the demands of the expanded plant.

The proposed plant configuration is given in following table:

Sl. No.	Plant Unit /Particulars	Plant Unit Configuration/Capacity			Remarks
		Existing as per EC – 2022 [29.07.2022] & Amendment dt. 27.09.2023	Addl. Under Present proposal	Final	
1.	EC Capacity				
A	PRODUCTS				
a)	Gross Hot Metal (GHM) Production	2.7 MTPA	0.72 MTPA	3.42 MTPA	

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Sl. No.	Plant Unit /Particulars	Plant Unit Configuration/Capacity			Remarks
		Existing as per EC – 2022 [29.07.2022] & Amendment dt. 27.09.2023	Addl. Under Present proposal	Final	
b)	Crude Steel Production	2.5 MTPA	0.59 MTPA	3.09 MTPA	
c)	Finished / Saleable Steel Production	2.4104 MTPA	0.5086 MTPA	2.919 MTPA	
d)	Cold Pigs Production:	214000 TPA	-	214000 TPA	
B	BY-PRODUCTS				
a)	Benzol Plant : Crude Benzol Production	16800 TPA	-	16800 TPA	
b)	Ammonium Sulphate Plant	19200 TPA	-	19200 TPA	
c)	Tar Plant : Crude Tar Production	72000 TPA	-	72000 TPA	
d)	Granulated BF Slag	0.889MTPA	0.292 MTPA	1.181 MTPA	
2.	Coke Oven Complex				
a)	Composition / Availability :				
	Coke Oven Battery (COB) No. # I	COB # I (2x44 Ovens, height 5.5 m; Stamp Charge; CDCP)	-	COB # I (2x44 Ovens, height 5.5 m; Stamp Charge; CDCP)	Earlier conventional battery dismantled
	COBs # II, # III, # IV, #V, # VI	Each 78 Ovens, height 4.45m; Top Charge; Wet Quenching)	-	Each 78 Ovens, height 4.45m; Top Charge; Wet Quenching)	Battery # IV under rebuilding. Adequate for meeting requirements of proposed expansion
	Gross Coke Production	1.7 MTPA	-	1.7 MTPA	
b)	CDCP Green Power : 10 MW	CDCP Extraction Turbine 12 MW; Power Generation 10 MW		CDCP Extraction Turbine 12 MW; Power Generation 10 MW	Part of COB#I
3.	Byproducts Plant				
e)	Benzol Plant : Crude Benzol Production	16800 TPA	-	16800 TPA	No Change
f)	Ammonium Sulphate Plant	19200 TPA	-	19200 TPA	
g)	Tar Plant : Crude Tar Production	72000 TPA	-	72000 TPA	
4.	Sinter Plant Complex :				
a)	Sinter Plant SP # I (2X143.2 m ²)	1.5 MTPA	-	1.5 MTPA	No Change
b)	Sinter plant SP # II (1X180m ²)	1.9 MTPA	-	1.9 MTPA	No Change
c)	Total Gross Sinter Production :	3.4 MTPA	-	3.4 MTPA	
5.	Micro-Pelleting /Briquetting plant	0.2 MTPA	-	0.2 MTPA	To ensure effective reusing/re-cycling solid waste fines generated.
6.	Pellet Plant	-	2.5 MTPA	2.5 MTPA	To be set up through PPP mode
7.	Blast Furnace :				
a)	BF# 2 : 1x1400 m	1.755 MTPA	(-) 0.695 MTPA	-	To be decommissioned
b)	BF# 3 : 1x1540 m ³ , GHM Production			1.06 MTPA	To be upgraded
c)	BF#4 : 1 x 1800 m ³ ; GHM Production	0.945 MTPA		-	To be placed on "Standby"
d)	BF#5: 1 x 3000 m ³ ; GHM	-	2.36 MTPA	2.36 MTPA	New facility

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Sl. No.	Plant Unit /Particulars	Plant Unit Configuration/Capacity			Remarks
		Existing as per EC – 2022 [29.07.2022] & Amendment dt. 27.09.2023	Addl. Under Present proposal	Final	
	Production				
	Total GHM Production	2.7 MTPA	0.72 MTPA	3.42 MTPA	
e)	BF Gas Cleaning Plant (GCP): BF #2, #3 & BF #4	BF Gas Cleaning Plant (GCP): BF #2, #3 & BF #4	GCP BF # 5	GCPs of BF#3, BF#5	
f)	Slag Granulation Plant (SGP):	888696 TPA	292000 TPA	1180696 TPA	
g)	Pig Casting Machine	214000 TPA	-	214000 TPA	No change
8.	Steel Melting Shop & Associated Facilities				
a)	Hot Metal Mixer	2 x 1300 t	-	2 x 1300 t	
b)	Hot Metal De-sulphurisation Unit : 1.4 MTPA	1.4 MTPA	-	1.4 MTPA	Yet to be installed
c)	Charging Ladles 140 t	140 t		140 t	No change – For hot metal supply from Mixers to BOF
d)	Basic Oxygen Furnaces (BOFs)	3x120 t (3x110 m ³): 3/3 Convertor Operation	-	3x130 t (3x110 m ³): 3/3 Convertor Operation	Facilities for blowing of all 3 BOFs simultaneously. Convertor shell changing, relining carried out during capital repair; cooling stack, hood change & BOF GCP upgradation shall be done
e)	Ladle Furnace (LF)	3x130 t	-	3x130 t	
f)	Secondary Refining : Vacuum Arc Degassing (VAD)	1X130 t	-	1X130 t	
g)	Gas Cleaning Plant (GCP)	83000 Nm ³ /hr	-	83000 Nm ³ /hr	No change in gas circuit. Only replacement of fin fan cooler and upgradation of thickeners.
9.	Casting Facilities				
a)	Billet Caster	2X6 strand	0.59	2X6 strand. Cap.: 1.8 MTPA	To be upgraded
b)	Bloom Caster	1X4 strand		1X4 strand	No Change
c)	Bloom-cum-Round Caster	1X4 Strand		1X4 Strand	No Change
d)	Ingot Casting	Bottom Pouring Ingot Casting for 2.5% liquid steel (for high grade steel for wheels) & rest through continuous casting		-	No change
	Total Crude Steel Production	2.5 MTPA	0.59	3.09	
10.	Rolling Mills				
a)	Existing Merchant Mill	0.4 MTPA	-	0.4 MTPA	
b)	b1) New Bar Mill: (1.0 MTPA) Products: size range of dia.8-16 mm with design capability & facility for producing TMT bars of dia. 20 & 25 mm.	1.0 MTPA	-	1.0 MTPA	Order placed – to be set up

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Sl. No.	Plant Unit /Particulars	Plant Unit Configuration/Capacity			Remarks
		Existing as per EC – 2022 [29.07.2022] & Amendment dt. 27.09.2023	Addl. Under Present proposal	Final	
	b2) New Bar Mill (0.4 MTPA) Product: 8 mm & 10 mm dia. TMT bars Location: In the vacant shed of Skelp Mill	-	0.4 MTPA	0.4 MTPA	To be set up through PPP Mode
c)	Wheel & Axle Plant	0.16 MTPA (with Online Heat Treatment Facility)	-	0.16 MTPA (with Online Heat Treatment Facility)	
d)	New Medium Structural Mill (MSM)	1.0 MTPA	0	1.0 MTPA	
e)	Section Mill	in Operation till Full Capacity Utilization of Medium Structural Mill	-	0	Operations to be discontinued on stabilization of MSM
	Total Finished Steel / Saleable Steel Production :	2.4104 MTPA	0.5036	2.914 MTPA	
11.	Old Power Plant (OPP)				
	Dual Fired (Coal & Gas) Boiler	Dual Fired (Gas & Coal) Boilers No. 1, 2, 5 & 6 (68 TPH each).		4 x 68 TPH	
	Gas Fired Boiler	Three Gas Fired Boilers: No. 3 & 4 (68 TPH each) & New No. 7 (100 TPH).		2 x 68 TPH + 1 x 100 TPH	
	Turbo-Alternators	4 x 5 MW Steam driven Turbo-Alternators with Max. Power Generation 4x5 MW (Category –I Load).		4 X 5 MW	
12.	Associated Facilities				
a)	Calcined Lime Plant (3X300 t/d)	0.2485 MTPA	-	0.2485 MTPA	
b)	Calcined Dolomite Plant (1X300t/d)	0.0694 MTPA	-	0.0694 MTPA	
c)	Oxygen Plant: Captive	1x350 TPD	-	1x350 TPD	
d)	Oxygen Plant : BOO basis	1x1250 TPD	1x1250 TPD	2x1250 TPD	Existing 1x1250 TPD under advanced stage of implementation
e)	Foundry shop with EAF	Furnace 6 t	0	Furnace 6 t	No change
f)	Raw material Handling Complex	7.5321 MTPA	-	7.5321 MTPA	No change
g)	Coke Oven Gas Holder	70,000 m ³	-	70,000 m ³	No change
h)	BF Gas Holder	1,00,000 m ³	-	1,00,000 m ³	No change
i)	Existing BOF Gas Holder	40,000 m ³	-	40,000 m ³	No change
j)	Liquid Oxygen Holder	2000 t	-	2000 t	No change
k)	Propane Unit (2x200t)	2x200 t = 400 t	-	2x200 t = 400 t	No change

The major finished products that shall be produced at the expanded steel plant are:

- 1) TMT Bars: 1.728 MTPA
- 2) Medium structurals (Beams, Channels, Equal Angle, etc.): 1.0 MTPA
- 3) Surplus Rounds for sale: 0.163 MTPA
- 4) Wheels: 46500 nos. (0.028 MTPA)
- 5) Cold Pigs: 0.214 MTPA

The major finished by-products that shall be produced at the expanded steel plant are:

- a) Granulated Blast Furnace Slag: 1180696 TPA
- b) Crude Tar: 72000 TPA

- c) Crude Benzol: 16800 TPA
- d) Ammonium Sulphate: 19200 TPA

Presently DSP's raw material requirement is ~9.145 MTPA inclusive of 0.56 MTPA oxygen and 0.107 MTPA iron & steel scrap. DSP sources its entire requirements iron ore from SAIL's captive mines in Jharkhand & Odisha. The expanded plant's raw material requirement is estimated to be 11.698 MTPA including 0.875 MTPA oxygen and 0.136 MTPA scrap generated in-house. Most of the raw materials are transported to the plant railways. The existing material handling facilities shall be augmented to handle the additional raw materials.

Present Makeup water requirement for the plant is 91440 m³/day which shall increase to 115440 m³/day. The water is supplied by Damodar Valley Corporation (DVC) from Damodar River. DSP has an agreement with DVC for supplying 135000m³/day of makeup water.

The expanded plant's power requirement shall increase from 165 MW at present (of which 22 MW is supplied to ASP) to 251.5 MW (i.e. additional 86.5 MW). 134 Power shall be supplied from the captive power plant which is operated by a separate company NSPCL, 100 MW will be drawn from Damodar Valley Corporation and 17.5 MW shall be generated in-house.

The total capital cost of the proposed expansion programme is Rs. 5667.60 Crores and the capital cost for environmental protection measures is proposed as Rs. 200 Crores.

4.0 BASELINE ENVIRONMENTAL STATUS

Baseline environmental data was generated during Post-monsoon season, 2024 (October-November-December). This includes monitoring of site-specific Micro-meteorology (1 location), Ambient Air Quality (10 locations) & Noise Levels Monitoring (10 locations), which were monitored by setting up of monitoring stations at selected locations. Grab samples were collected from selected locations for water and soil. Further, existing ecological and socio-economic features were also studied. Traffic density was also measured on roads which are used by traffic originating from & destined for the plant. These baseline monitoring and analysis for these attributes were carried out by MECON Ltd.

Micro-Meteorological Data: A Micro-Meteorological station was set up to generate meteorological data during post monsoon season, 2024 on the roof of IspatBhawan, the administration building of DSP at Latitude 23°33'41"N & Longitude 87°15'05"E. Meteorological data was generated continuously at 1 hour intervals throughout the monitoring period from [Oct. to Dec. 2024]. During post-monsoon season, 2024 at Durgapur Steel Plant area, wind was mostly blowing from North-North-West (NNW), followed by, North-West (NW), North (N) and West-North-West (WNW). The maximum temperature recorded was in the month of November (37.1 °C) and minimum was recorded in December (14.2 °C). 23.8 mm was recorded during October over 5 rainy days [November & December were dry].

Ambient Air Quality: The results indicate that ambient air quality monitored are well within the norms at all the ten (10) monitoring locations in the study area for PM₁₀, PM_{2.5}, SO₂, NO₂, NH₃, CO, O₃, Pb, Ni, As, benzene and Benzo(a)Pyrene (BaP) as prescribed by NAAQS 2009.

Chemical characterization of particulate matter was also done at all AAQ stations & the results have been compared with the characterization of particulate matter within the plant area as well as raw material handling area. The proportion of total metals and the proportion of Iron & Manganese in PM₁₀ at the AAQ Monitoring Stations were much less when compared to the corresponding values in dust emitted from the plant (both fugitive as well as from stacks). This indicates that only a small proportion of the PM₁₀ at the AAQ Monitoring Stations is contributed by the Durgapur steel plant.

Ambient Noise levels: The ambient mean noise levels at ten locations covering Two Commercial Areas, one Industrial area, two Silence Zones and five residential locations are well within the respective norms.

Water quality: Surface water samples were collected from ten locations and analysed for different parameters and compared with IS 2296 1982 and CPCB's Water Quality Criteria for Surface Water.

Result shows that water quality of Tamla Nala (SW1, SW8), water quality of Singaran Nala (SW3, SW4) and water quality of Damodar River (SW5, SW6, SW9, SW10) and raw water reservoir of DSP (SW7, Damodar's water) meets the criteria specified for Class-C (i.e. suitable for "Drinking water source after conventional treatment and after disinfection"). Water quality of Tamla Nala, downstream of DSP meets the criteria specified for Class-D (i.e. suitable for "Propagation of Wild life and Fisheries").

Eight groundwater samples were collected during the post monsoon season 2024. The results have been compared with drinking water norms of IS: 10500 (2012), Amendment No. 1, 2015.

Overall ground water quality in the study area was found to be within the norms of IS: 10500 (2012), Rev.2, Amendment No. 4, November 2021.

Soil: Soil quality was determined at eight locations during the monitoring season. Analysis of the soil samples indicate that in the study area, the soil pH varied from 5.3 ("Moderately acidic") – 8.7 ("Strongly Alkaline"). Levels of Available Phosphorus were "Low" in all samples; Available Nitrogen from "Low" to "Medium" and Available Potassium "Low" to High". Overall the fertility varied from "Low" because of lower levels of one or more of these three limiting nutrients. The results for exchangeable cations show that the calcium constitutes the bulk followed by magnesium in the tested soil samples. Calcium aids in translocation of photosynthesis from leaves to fruiting organs and magnesium is the key element of chlorophyll production and activator of many plant enzymes. In the study area, the level of some micro-nutrients is above the critical limits. Hence, it implies that no external application of micro-nutrients is required (fertilisers) for good plant growth. However, it must also be noted that very high concentrations of one or more micro-nutrients may be detrimental to plant growth and soil fertility may be adversely affected.

Traffic volume survey: Traffic volume survey (TVS) was recorded hourly continuously at 4 (four) locations on both sides of NH-19 and the two roads linking NH-19 to DSP on 25th October 2024. NH-19 is a 6-lane divided carriage-way on plain terrain, whereas the approach road to DSP Main Gate is a 4-lane road with divided carriage-way on plain terrain and the other approach road to DSP's Tamla gate is a 2-lane undivided arterial road. The recorded traffic volumes at all the surveyed roads were within their respective design service volumes as per IRC:109 - 1990.

Ecology: The study area is part of the Lower Damodar Valley and is an alluvial plain. All the works under the proposed expansion programme will be implemented within the premises of the existing steel plant. The flora of the project site includes grasses, shrubs, herbs and few scattered trees. None of the plant species reported from the proposed project site are listed in Schedule III of "The Wild Life (Protection) Amendment Act, 2022. The study area is mix of rural and urban areas and comprise of rural & urban settlement (including industrial lands), agricultural land (paddy is by far the principal crop), grass lands, small patches of natural forests & plantations, coal mines (underground & open cast), River (the Damodar) and fresh-water ponds. There is no Biosphere Reserve, Ramsar Site, Tiger Reserve, Wildlife Sanctuary, National Park, Elephant Reserve, Animal Migration Corridor within 15 km of the project site. The nearest Reserve Forest is Ukhra R.F. located 8.5 km north of DSP. This R.F., has however been converted into an Australian Acacia plantation. Small patches of natural sal forest are seen scattered in the northern half of the study area. These forest patches are probably remnants of the original forests which had covered the area. The Damodar River flows through the study area about 1.2 km SE of DSP. A barrage has been constructed across the Damodar River about 7.7 km SE of DSP. The banks of Durgapur Barrage are covered with thick vegetation. Large thickets of Sarkanda have developed in the shallows. Thickets of *Typha angustata* along with sedges can also be seen along the banks of the reservoir, especially on the southern side. Mats of Water Hyacinth are present in the reservoir, both floating in deep water as well as along the banks. Due to construction of the barrage across the river, there is wide expanse of dry sandy river bed immediately downstream of Durgapur Barrage. The most prominent vegetation of this sandy area is *Saccharum spontaneum* grass.

As regards animals, Schedule I animals reportedly present in DSP are Yellow Rat Snake and Russel's Vipers which have been seen in plant's green belt. Other Schedule I animals found in the study area are Elephant, Jackal, Fox, Jungle Cat, Grey Mongoose, Small Indian Mongoose, Grey Wolf, Hyaena, Common Palm Civet, Barn Owl, Shikra, Osprey, Monocled Cobra, Spectacled Cobra, Chekered Keelback, Common Sand Boa, Indian Python, Indian Python and Monitor Lizard.

Land-use / Land-cover: Existing Land-use/Land cover pattern in the study area as interpreted from RESOURCESAT 2A, LISS-IV satellite imagery (Cloud free) dated 08/01/2025. As per the satellite imagery, of the total study area, 21.93% is built-up area & industrial area, 55.39% is agricultural land, 5.67% is forest land (plantations & natural forests), 5.23% is wastelands including barren rocky areas, open cast mine quarries & ash pond of thermal power plants and 11.78% is water bodies.

Socio-economic environment: Socio-economic survey was conducted covering representative villages identified in the study area. The demographic characteristics of population like, Literates, illiterates, employed, unemployed, old age, youths, males and females were included in the survey. Also, the needs of the people within the study area were also identified based on a Needs-based socio-economic assessment.

There are about 814269 persons in the 10 km study area as per 2011 Census, which is anticipated to have increased to 941401 as per the decadal growth of the area published by Census of India. There are about 924 females per 1000 males in the study area where as for Paschim Bardhaman district it is 918 females per 1000 males. Literacy rate in the district is 78.75% whereas in the study area it is 73.98%. As per 2011 census altogether "Main workers" constitute 25.953% of



the population of the 10 km radius area. "Marginal workers" constitute 8.74% of the study area's population. Some of the needs identified at the village level are improvement in education infrastructure, improvement in public health care delivery system and Skill development of youth.

5.0 ENVIRONMENTAL IMPACTS ASSESSMENT & MITIGATION

Impact of project activities on environmental attributes in study area including ambient air quality, surface & ground water quality, noise level, soil quality, socio-economic profile & flora & fauna and drainage pattern have been assessed.

Impact on Land environment: The entire expansion project will be implemented on land owned by Steel Authority of India Ltd. (SAIL) and in the company's possession. All construction activities will be limited within land owned by SAIL / DSP and in the company's possession. Thus no adverse impact on the topography or land use of the surrounding areas is anticipated due to the project.

Impacts on ambient air quality: Air quality modelling carried out for prediction of impact of the project using AERMOD model. The exercise has taken into account stack emissions, emissions from raw material storage & handling, vehicular movement and construction activities.

The construction of the expansion units shall involve civil works primarily, which will generate fugitive dust. Vehicular emission from trucks etc. is also another contributor to the emissions during construction to ambient air. During operation phase, the stacks of the plant are the major point sources, material handling activities are the major area sources and the tentative road transport for incoming raw material and product despatch is the major line source. Predictive modelling of the air emissions for all the sources cumulatively was done for PM₁₀, PM_{2.5}, SO₂, NO_x and CO. The Ground Level Concentrations (GLC) for all these parameters were superimposed on the baseline AAQ of the area and the future predicted AAQ for all the parameters were found to be within the NAAQS norms.

The modelling exercise has indicated that under normal operating conditions, AAQ shall remain within the prescribed NAAQS even after implementation of the proposed expansion project. Under abnormal working conditions, the resultant PM levels may marginally exceed the prescribed limits.

All of the stacks have been envisaged with state-of-the-art pollution control measures, with design emission standards meeting the applicable Industry specific emission standards for steel plants. Fogging systems shall be deployed / installed for suppression of fugitive dust from roads & raw material handling areas. Dust screens shall be erected to attenuate fugitive dust. Emissions PM from all stacks shall be restricted to <30 mg/Nm³ by use of high-efficiency Bag Filters and ESPs. Use of Low NO_x burners and relatively cleaner fuels shall limit NO_x emissions. Relatively clean fuel BF Gas, LD Gas and Coke Oven gas have been envisaged as primary fuels in the plant. Also, covered conveyors are used for the movement of dry bulk raw materials inside the plant.

Impact on ambient noise levels: The noise levels due to the construction of the project may increase due to vehicular traffic, handling of heavy metallic equipment/ items and metal fabrication, operation of diesel-powered construction equipment/ machinery such as excavators, cranes, drills, concrete mixers, etc. During operation phase, noise may be generated due to handling of raw materials, operation of high speed blowers of the furnaces, operation of various rolling mills,



operation of high-speed compressors in oxygen plant, operation of turbines in power plant, handling of heavy pieces of semi-finished and finished products, etc.

It is anticipated that the max. noise generated by diesel-powered machinery deployed for excavations shall be 85 dB(A) at ~1 m distance from the machinery during the construction phase. Predictive modelling for the construction noise shows that increase in noise levels due to construction will be negligible outside the plant boundary, and will be limited mostly within the proposed project site. During operation of the plant, the Source noise levels of the plant equipment and machinery are considered in the range of 90-100 dB(A). The predictive noise levels during operation phase show that the increase in noise levels due to operation of the plant will be negligible outside the plant boundary and will be mostly limited within the proposed site.

Various measures envisaged in the expanded plant include technological measures for reduction of noise at source, provision of acoustic lagging for equipment and suction side silencers, vibration isolators, selection of low noise equipment, isolation of noisy equipment from working personnel. Whenever these measures are not practicable, administrative and personnel protection measures like provision of rotation of workers to minimize exposure time as well as provision of ear muffs to workers exposed to high noise areas are envisaged.

Impacts on Surface water resources and quality: The plant draws makeup water from Damodar River. Drawal of water from Damodar River shall not exceed the amount for which permission has already been obtained from Damodar Valley Corporation. Further, the plant is implementing Zero Liquid Discharge (ZLD) with maximum recycling of treated wastewater and conservation of freshwater resources. 620 m³/hr. of effluents have already been brought under purview of this ZLD Scheme. Presently only about 80 m³/hr. Of treated effluents are discharged outside the plant but this will be discontinued on completion of the ZLD Scheme. The new units will be part of the ZLD scheme from inception. Since no wastewater shall be discharged outside the plant premises, no adverse impact on nearby surface water bodies is anticipated.

Impacts on Groundwater resources and quality: The existing plant does not abstract any groundwater nor the same has been envisaged for the proposed expansion project. Dry bulk raw materials are stacked on masonry platforms with engineered surface run-off collection & treatment systems. Additional covered silos are also being planned for storage of coal.

Impact on road traffic: The incremental traffic during operation of the plant shall include trucks traffic for raw material and product movement and movement of employees by cars and two-wheelers. Only a small proportion of DSP's raw materials are received by road.

Presently about 11 truck-loads per day of raw materials & consumables are delivered to the plant. It is expected that only about 29500 TPA additional raw materials will be transported to DSP by road. For transportation of finished steel products, at present about 30% of the products are dispatched through road. The same shall also continue in future. It is expected that, about 45 trucks carrying finished goods will be despatched daily i.e. truck traffic on account of finished material despatch will increase by ~90 nos. per day.

Movement of additional 100 - 105 trucks per day on NH-19 will hardly be measurable as the existing daily Heavy Motor Vehicle movement on NH-19 is more than 15000.



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Additional LMV traffic is expected to be only 40 – 50 nos. per day vs. ~15000 nos. per day at present. Additional 2-wheeler traffic is expected to be only ~1200 nos. per day vs. ~15700 nos. per day at present.

Impact on terrestrial and aquatic habitat: Expansion of the existing plant shall lead to clearance of existing vegetation at the sites of 2 of the proposed expansion units, which comprises mostly of some shrubs and weeds and few common trees including Subabool, which is an invasive species. Since the area to be cleared is small (~23 acres / 9.31 ha) and that too inside the steel plant, the loss of vegetation will have hardly any effect on the area's ecology. Anyhow DSP is planting large number of trees every year in its township in association with the State Forest Department which will compensate the loss of vegetation.

Since the project site is within Durgapur Steel Plant & Durgapur Steel Plant's Office Complex, no loss of habitat of faunal species is expected due to the proposed expansion project.

The ecology of the Damodar River within the study the area is also expected to remain unaffected due to the proposed expansion programme as no discharges to the river are envisaged from the expanded plant.

The proposed expansion project shall be implemented within DSP's existing premises and shall not require any large scale clearance of vegetation.

DSP has already developed 250 ha of green belt and plantations in the steel plant's existing premises. DSP has been carrying out extensive plantations on its land in association with the Sate Forest Department. Nowadays only indigenous species are being planted. By 2031 – 32 DSP plans to develop another 141.4 ha of plantations at an estimated cost of about Rs.1.874 crores.

Presence of Schedule-1 terrestrial and aquatic fauna has been observed within the 10 km radius study area. However, DSP's activities are not expected to affect the study area's wildlife. Nevertheless DSP had prepared a Site Specific Wildlife Conservation Plan for Schedule I Fauna through "Durgapur Wildlife Information and Nature Guide Society" and submitted the same to the Divisional Forest Officer (DFO), Durgapur Forest Division vide letter no. ECD.02.18 dated 12-05-2022. The total budget for implementation of Wildlife conservation plan is Rs. 720.95 Lakhs for the period of 10 years. Of this Rs.289.46 lakhs is to be spent by DSP and 431.49 lakhs is to be spent by the Forest Department. A fresh plan necessitated due to changes as per "The Wild Life (Protection) Amendment Act, 2022" dated 20.12.2022 is being prepared for approval and implementation. DSP shall implement the Approved SSWLP.

Impact on Socio-economic environment: DSP's proposed expansion of the existing steel plant may have short term and long-term impacts over the socio-economic condition of the 10 km radius study area. The proposed expansion does not involve any land acquisition, i.e. displacement of people. The construction of the expansion project will generate ~1.69 million man-days of direct employment. Most of the construction workers will be from nearby towns & villages. Operation of the expanded plant is expected to generate additional 620 nos. of direct employment, which too will be from amongst local people. The income derived from the employment will boost the local economy. DSP's continuing CSR activities will further improve the area's social infrastructure.



Various developmental activities as part of DSP's CSR activities shall be implemented upon setting up and operation of the expansion units. The same will be further augmented through management measures which will be proposed as part of the Corporate Environmental Responsibility (CER).

6.0 ANALYSIS OF ALTERNATIVES

The proposed project envisages expansion of an existing integrated steel plant. Almost the entire proposed expansion project shall be carried out within the premises of the existing steel plant. Only the 1250 TPD Oxygen plant to be implemented through the PPP mode) will be installed over ~3.24 ha (~8 acres) area just outside DSP's existing boundaries but within the land owned by DSP & in the company's possession (the oxygen plant site is a vacant area just behind DSP's Laboratory complex). Hence, no alternative sites are considered.

DSP manufactures steel through the proven BF-BOF route. There is no proposal for changing this technology.

7.0 ENVIRONMENTAL MONITORING PROGRAMME (EMP)

To ensure effective implementation of proposed mitigation measures, elaborate arrangements are envisaged by DSP for monitoring of various environmental parameters. Environmental aspects to be monitored include drainage systems, water quality, emissions and air quality, noise pollution, solid/hazardous waste utilization, green belt development, housekeeping & occupational health.

Ambient air, noise, water and solidwastes: One (01) Micro-meteorological station for continuous monitoring of site-specific meteorological parameters has been setup on the roof of DSP's Project Building, just outside the plant premises.

Two Continuous Ambient Air Quality monitoring stations (CAAQMS) have been setup, one within DSP's premises and the other in the township. Site survey for setting up two more stations is going on. In addition, there are 6 AAQ locations around the plant and monitoring is carried out monthly.

Continuous Emission Monitoring Systems (CEMS) have been provided in existing 37 stacks for continuous online monitoring of PM, SO₂, NO_x in stack gases and will also be provided for future stacks also. Work-zone air quality shall also be monitored once a month, to assess the levels of particulate matter inside the plant.

At present, Noise levels are being monitored inside the plant once in a month as well as at 4 ambient locations. ECD maintains a record of noise levels and takes necessary organisational actions like rotation of workmen, availability and use of personal protective devices, damage to enclosures or insulation layers over enclosures and piping.

DSP is implementing Zero Liquid Discharge (ZLD) schemes. Presently, 620 m³/hr of effluents are treated in a Reverse Osmosis (RO) based treatment system. Treated water and rejects from the scheme are used for industrial purposes in the plant. Presently, only 80 m³/hr of treated effluents are discharged outside the plant. On implementation of the entire ZLD Scheme even this will be discontinued. The expansion units shall be part of the ZLD Scheme from inception itself.



Inventorization of all major solid and hazardous wastes is being done in the existing plant, which will also be done after the proposed expansion. Presently DSP is virtually recycling all its solid wastes or selling them off to external agencies for other uses or recycling as applicable.

Greenbelt: No. of trees planted, species of trees planted, no. of trees survived and locations and area where greenbelt has been developed shall be recorded once every year.

Social parameters: The socio-economic interventions under CSR and CER shall be recorded every year along with the location of the villages benefitted, physical targets achieved and expenditure made for implementation of the social interventions.

8.0 ADDITIONAL STUDIES

Risk Assessment & Disaster Management Plan

Hazard Identification and Risk Assessment (HIRA) was carried out for the proposed expanded integrated steelplant. The plant produces and stores BF Gas, LD Gas and Coke Oven gas which are flammable and toxic. The plant stores propane gas which is a flammable gas. The plant produces and stores Crude Benzol which is flammable and toxic liquid. The plant stores sulphuric acid which is a corrosive liquid and LDO which is flammable liquid. There are several settlements around DSP. The minimum distance between any hazardous material storage facility and habitation is just over 0.8 km. 2 new storage tanks, each of 1000 KL, are planned under the proposed expansion project. The primary hazards identified due to handling of these hazardous substances are fire and explosion due to release of these gases and as well as toxic dispersion effects due to release of these gases and liquids from respective storages from leaks or rupture of associated pipeline/storage vessels. The results of Maximum Credible Accident (MCA) analysis scenario based quantitative consequence analysis indicates that the maximum fire hazard distances and explosion overpressure distances in case of complete failure of tankages of these gases& liquids and catastrophic rupture of gas storage tanks shall be limited within about 350 m beyond the plant premises. The proximity analysis of nearby habitations with the identified facilities, that all habitations are beyond the minimum safe distances for no lethal fire, explosion and toxic effects due to the hazardous facilities and thus no severe offsite emergency is anticipated due to the hazardous facilities.

Socio-Economic Impacts Study

A need-based socio-economic impact assessment of the study area has been carried out starting with scoping of issues related to potential significance like education, health, drinking water facility, employment and income etc. The major findings of the socio-impact assessment study indicated that the project is not going to cause any damage to the existing agricultural situation. The project shall have positive impact on pattern of demand and strong positive employment and income effects. There is a possibility of increase in industrialization in the vicinity of the plant, which shall bring more skill diversification among local people. The project shall have strong positive impact on raising average consumption and also income through multiplier effect. The CSR activities of DSP will have very strong positive impact on the social and economic condition of the people of the study area. The project shall also have significant positive impact on community development activities of the



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project due to continuing CSR activities of DSP which are likely to bring benefits to the people of the study area.

9.0 PROJECT BENEFITS

Under the proposed expansion programme, old resource guzzling units with higher specific emissions will be replaced by modern efficient units with state of the art pollution control and resource optimisation systems, thereby improving environmental performance and resource utilisation of the plant. The plant's products will be more in line with market demands e.g. TMT Bars of lesser diameter which are in demand but are not produced by DSP at present.

The proposed expansion project promises to boost the local economy through direct and indirect employment during construction and operation phases. It aims to create around 1688855 mandaysemploymentduring construction and 620 nos. direct jobs during operation of the expansion units, invest in peripheral development and socio-economic initiatives, enhance infrastructure, and generate substantial state and central government revenue by reducing import costs. Also, the expanded plant's proposed environmental pollution mitigation measures shall ensure sustainable and environmentally safe industrial development in the area.

10.0 ENVIRONMENTAL COST BENEFIT ANALYSIS

The proposed expansion project involves initial pollution control investment of ~Rs.200Croresand annual recurring costs of ~Rs. 1.108 Crores. PM control shall meet already stringent norms. Water measures meet statutory requirements, offering no extra benefits. Waste utilization generates substantial revenue and saves land which would have otherwise been required for waste dumping, all indicating the project's environmental investments to be favourable.

11.0 ENVIRONMENT MANAGEMENT PLAN (ADMINISTRATIVE ASPECTS)

DSP is committed, as a responsible corporate entity, towards protection of environment and the community and also to employ best environmental management practices, regular maintenance and consistent operation of pollution control systems, recycling of solid & liquid wastes and adoption of cleaner and environment friendly technologies etc. The concerted efforts put forth earlier and proposed through the Environmental Management Plan (EMP) are expected to result in resource conservation, waste reduction as well as cleaner environment.

The primary objective of the EMP is to minimize and address potential environmental impacts associated with the proposed project. This plan focuses on mitigating these impacts in various phases of the project. During the construction phase, covered trucks will be employed for materials transportation to minimize environmental effects. Additionally, greenbelt has been developed and maintained to attenuate fugitive dust and noise generated at the steel plant. Construction activities will be restricted to daytime hours as much as possible to further limit potential disruptions. Water sprinkling will be routinely conducted to suppress fugitive dust, contributing to improved air quality. Furthermore, workers will be provided with Personal Protective Equipment (PPE), and designated locations will be equipped with first aid facilities to ensure their safety and well-being.

In the operational phase of the expanded plant, DSP will uphold a comprehensive environmental management plan specific to the plant. This plan encompasses a wide range of environmental



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protection measures to effectively mitigate environmental impacts. Solid and hazardous waste management will strictly adhere to the guidelines outlined in the Hazardous Waste (Management, Handling, and Trans-boundary Movement) Rules of 2016. Noise levels within the plant premises will undergo regular monitoring to maintain them within permissible limits, thus reducing noise pollution.

An amount of ~Rs. 200 Crores is earmarked as capital cost for EMP implementation. Additionally, ~Rs. 1.108 Crores will be budgeted annually for the meeting the operation and maintenance costs of the EMP measures, ensuring their continued effectiveness in environmental protection.

A separate Environment Control Department (ECD) has been setup to look after the environmental activities of the existing steel plant. This Department will look after the environmental aspects of expanded plant also. The implementation and monitoring of effectiveness of the environmental mitigation measures during the operation phase will be done by the ECD. Also, SAIL's commitment to protection of the environment is reflected in the company's Corporate Environmental Policy, which will guide the administrative aspects of EMP implementation in the proposed plant. In summary, the EMP will be a vital component of DSP's commitment to minimize environmental impacts and promote responsible environmental stewardship throughout the project's lifecycle.

12.0 SUMMARY AND CONCLUSION

SAIL's proposal for expansion of the existing Integrated Steel Plant located at Durgapur, Paschim Bardhaman district, West Bengal shall serve the need for augmenting the overall production capacity of steel in the country.

This EIA study highlights that the judicious implementation of proposed Environmental Management Plan will ensure negligible negative impacts on the environment with direct and indirect positive development to the society due to the proposed project.

In the design of the proposed expansion units, latest state-of-art technology has been envisaged so as to meet the desired air emissions and noise level standards from plant operations levels. Discharge of effluents beyond plant boundary is not anticipated as the plant facilities have been implemented with "Zero Liquid Discharge" concept. Wastewater generated at the plant will be treated in Reverse Osmosis (RO) based treatment system. The treated water recovered from the system will be recycled back in the process. RO rejects shall be utilised for Coke Quenching and Slag Granulation in the plant. A Sewage Treatment plant (STP) shall also be setup to treat and utilize waste domestic wastewater within the plant. All generated solid waste will be either recycled back into the respective plant operations or sold to authorised recyclers.

The environmental impacts associated with the proposed project were found to be manageable. The implementation of environmental mitigation measures recommended in the report will bring the anticipated adverse impacts to minimum. Site specific and practically suitable mitigation measures are recommended to mitigate the impacts. Further, a suitable monitoring plan has been designed to monitor the effectiveness of envisaged mitigation measures during the operation phase.