EXECUTIVE SUMMARY

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1.0 INTRODUCTION

M/s Tata Steel Limited (TSL), one of India's leading steel producers with an annual capacity of 27.3 MTPA, operates an integrated steel plant at Meramandali (TSM), Odisha. The plant was granted Environmental Clearance (EC) vide letter no. J-11011/829/2008-IA-II(I) dated 20.07.2012 and is spread over 673.62 ha across Dhenkanal and Angul districts, including 61.48 ha of forest land, for which Stage-II forest clearance was obtained in 2006.

The plant was originally established by M/s Bhushan Steel Limited and was subsequently acquired by Tata Steel Limited in May 2018. The current crude steel production capacity is 5.6 MTPA, spread over an area of 644.947 ha. A Thermal Power Plant (TPP), initially developed by Bhushan Energy Limited (now merged with TSL effective August 1, 2024), operates within the premises over an area of 28.676 ha. Although the steel plant and TPP function under a common administrative framework and share certain resources, they have been accorded separate Environmental Clearances and maintain independent statutory compliances.

Tata Steel Limited now proposes to enhance the capacity of the existing plant from 5.6 MTPA to 7.1 MTPA of crude steel and 8.3 MTPA of finished steel by producing value-added products from both in-house slabs and externally procured slabs. The proposed expansion will be undertaken within the existing land as well as additional land. An additional 229.44 ha of land is being acquired, comprising 66.54 ha in Dhenkanal district and 162.90 ha in Angul district. This includes 212.050 ha of private land and 17.398 ha of government land, increasing the total plant area to ~903.07 ha. Single-window clearance has been obtained from Industrial Promotion & Investment Corporation of Odisha Limited (IPICOL), Government of Odisha.

The proposed project involves capacity enhancement and modernization of existing units, leading to increased production through process efficiency improvements. New facilities proposed include a Thin Slab Casting and Rolling (TSCR) unit, additional BOF and LF capacities, a new lime kiln, air separation units and BF gas-based power generation. Supporting infrastructure will include electrical substations, railway yard expansion, material handling systems, storage yards, slag management facilities, utility systems, and process support units such as CETP and STP. Overall, the proposal aims at integrated capacity enhancement, operational optimization and infrastructure strengthening of the steel plant.

The Terms of Reference (ToR) for the EIA/EMP studies for the proposed expansion project were granted by MoEFCC vide ToR Identification No. TO25A1005OR5906405N dated 24.02.2026. A copy of the ToR was automatically forwarded to OSPCB through the PARIVESH portal for initiating the comment process. A site inspection was conducted by the Regional Officer, OSPCB, Angul, on 20.03.2026. Subsequently, comments on the proposal and environmental safeguards/ CTE were issued vide letter no. 5061/IND-II-CTE dated 04.04.2026.

Based on the above, the Draft EIA/EMP Report has been prepared for submission to OSPCB for conducting the Public Hearing.

2.0 PROJECT LOCATION

The existing steel plant, TSM is spread over 644.947 ha under villages Sibapur, Narendrapur, Sarapa and Raghunathpur, Nuagaon which are located in Odapada Block of Dhenkanal District of Odisha & Ghantighadia & Talabahal which are located in Banarpal Block of Angul District of Odisha between latitudes 20°46'47" N & 20°49'36"N and longitudes 85°13'44" E to 85°16'43"E.

The proposed facilities are planned to be developed within the existing plant premises as well as on additional land parcels contiguous and adjacent to the existing plant area. Since the expansion is proposed on already available and adjoining land, no alternative site has been considered for the project. The project site (TSM's existing premises) is covered in the Survey of India (SOI) Toposheets Nos. F45T1 & F45T5, whereas the 10 km radius study area also includes parts of SOI Toposheet nos. F45T1, F45T5, F45T2 & F45T.

The plant is approached by road from NH-55. NH-55 connects Sambalpur with Cuttack via Redakhol, Boinda, Angul and Dhenkanal (the district Hq.). The nearest railway station is Budhapank on East Coast Railway's Sambalpur Jn.-Angul – Talcher – Dhenkanal – Nirgundi Jn. Meramandali Railway Station is located ~3.9 km due east of the plant. The plant is linked by railway lines to both Budhapank and Meramanadli railway stations. The nearest civilian airport with regular scheduled flights is Biju Patnaik International Airport, Bhubaneswar which is ~81 km SE of the plant boundary. The nearest port is Paradeep which is ~156 km ESE of the plant. The location of the project site is shown on Toposheet given in **Figure 1.**

The project site has no ecologically sensitive areas within 10 km. Kisinda Nala flows near the plant and is being conserved without diversion. The plant is located at a safe elevation with no flood risk history. Infrastructure expansion includes new process units, utilities, raw material handling systems, and support facilities.

Figure 1: Location and topographical map of Project Site

3.0 PROJECT DESCRIPTION

The proposed plant configuration is given in **Table 1** and Saleable Products of Existing Plant and After Expansion **Table 2.**

Table 1: Plant Configuration/Capacity: Present Status, Present Proposal and Final after Present Proposal

Sl. No.	Plant Unit /Particulars	Plant Unit Configuration/Capacity			
		As per EC dated 20-07-2012 and Subsequent EC Transfers, Amalgamation Amendments	Addl. Under Present proposal	Final Capacity	Remarks
1	**Coke Oven Complex**				
(a)	Coke Oven Battery (COB) No. # 1	• 2X 64 nos. stamp charged ovens; • Crusher: 4X320 TPH, • Screen: 2x150 TPH, • CDQ#1 Boiler: 64 TPH, • COBP including De-sulfurization • Capacity: 0.85 MTPA	0.15 MTPA	• 2X 64 nos. stamp charged ovens; • Crusher: 4X320 TPH, • Screen: 2x150 TPH, • CDQ#1 Boiler: 67.2 TPH, • COBP incl. De-sulfurization Capacity: 1.0 MTPA	Capacity upgradation through process optimization
	Coke Oven Battery (COB) No. # 2	• 74 nos. Top Charged ovens; • Crusher: 3x500 TPH, • Screen: 2x400 TPH, • CDQ#II Boiler: 94.5 TPH • COBP including De-sulfurization • Capacity: 1.25 MTPA	-	• 74 nos. Top Charged ovens; • Crusher: 3x500 TPH, • Screen: 2x400 TPH, • CDQ#II Boiler: 95.4 TPH • COBP incl. De-sulfurization • Capacity: 1.25 MTPA	No Change
	Gross Coke Production	**2.1 MTPA**	**0.15 MTPA**	**2.25 MTPA**	Capacity upgradation through process optimization
2	**Sinter Plant**				
a)	Sinter Plant SP # 1	Bed Area: 1 x 177 m^2, Crusher: 1X90 TPH, Screen: 2x140 TPH, Drum Mixture: 2X400 TPH Capacity: 1.85 MTPA	Capacity: 0.15 MTPA	Bed Area: 1 x 177 m^2, Crusher: 1X90 TPH, Screen: 2x140 TPH, Drum Mixture: 2X400 TPH Capacity: 2.00 MTPA	Production increase will be achieved through operational changes

Sl. No.	Plant Unit /Particulars	Plant Unit Configuration/Capacity			
		As per EC dated 20-07-2012 and Subsequent EC Transfers, Amalgamation Amendments	**Addl. Under Present proposal**	**Final Capacity**	**Remarks**
b)	Sinter plant SP # 2	Bed Area: 204 m^2, Base Blending Plant: 20000 TPD, Crusher: 3x150 TPH, Screen: 1x250 TPH PSW: (Screen: 1X150 TPH, Crusher: 1x100 TPH, Drum mixture 2x80 TPH, Barrel Reclaimer: 1x1950 TPH Capacity: 2.25 MTPA	Capacity: 0.25 MTPA	Bed Area: 224 m^2, Base Blending Plant: 20000 TPD, Crusher: 3x150 TPH, Screen: 1x250 TPH PSW: (Screen: 1X150 TPH, Crusher: 1x100 TPH, Drum mixture 2x80 TPH, Barrel Reclaimer: 1x1950 TPH Capacity: 2.50 MTPA	Production increase will be achieved through operational changes
c)	Sinter plant SP # 3	Bed Area: 204 m^2, Crusher: 3x150 TPH, Screen: 1x300 TPH, Capacity: 2.25 MTPA	Capacity: 0.25 MTPA	Bed Area: 224 m^2, Crusher: 3x150 TPH, Screen: 1x300 TPH, Capacity: 2.50 MTPA	Production increase will be achieved through operational changes
Total Sinter Production		**6.35 MTPA**	**0.65 MTPA**	**7.0 MTPA**	Capacity upgradation & process optimization
3	Coal Washery	Hammer Mill: 2X110 TPH Screen: 1X300 TPH Capacity: 2.4 MTPA	-	Hammer Mill: 2X110 TPH Screen: 1X300 TPH Capacity: 2.4 MTPA	No Change
4	DRI plant				
	DRI Kilns	10 x 500 TPD Kilns	-	10 x 500 TPD Kilns	
Total DRI Production		**1.5 MTPA**	**0.2 MTPA**	**1.7 MTPA**	Increase in capacity through upgradation of facilities and process optimization
5	Blast Furnace				
a)	BF# 1 :	1681 (I.V.) m^3 with three stove 1X40 TPH PCI, **Capacity: 1.53 MTPA**	Increase in Volume 1 Stove 1X40 TPH PCI, ~7 to 8 MW TRT Capacity: 1.07 MTPA	**~2650 (I.V.) m^3 with four stove 2X40 TPH PCI, ~7 to 8 MW TRT Capacity: 2.60 MTPA**	To be upgraded

Sl. No.	Plant Unit /Particulars	Plant Unit Configuration/Capacity			
		As per EC dated 20-07-2012 and Subsequent EC Transfers, Amalgamation Amendments	**Addl. Under Present proposal**	**Final Capacity**	**Remarks**
b)	BF# 2	1 x 3814 m^3 with three stove (HBT), 1X60 TPH +1X40 TPH PCI 2X150 TPH PCM for both BFs, TRT 16 MW **Capacity: 3.47 MTPA**	1 Stove Capacity: 0.18 MTPA	1 x 3814 m^3 **with four stove (HBT),** 1X60 TPH +1X40 TPH PCI 2X150 TPH PCM for both BFs, TRT 16 MW **Capacity: 3.65 MTPA**	To be upgraded
c)	Granshot	-	360 TPH	**360 TPH**	New Facility
Total Hot Metals Production		**5.0 MTPA**	**1.25 MTPA**	**6.25 MTPA**	
6	Steel Melting Shop				
a)	SMS 1	1X60 T EAF, 1 X 60 T LF 1X 60 T: VD/VOD, **Capacity: 0.3 MTPA Liquid Steel**	Capacity: 0.11 MTPA Liquid Steel	1X60 T EAF, 1X 60T LF 1X 60 T: VD/VOD, **Capacity: 0.41 MTPA Liquid Steel**	Production increase will be achieved through operational changes
b)	SMS 2	1X180 T CONARC twin Shell 2X180 T Convertor 2X180 T ARS 4X185 T HMDS, 1X180 T RH-OB, 1X180 T CAS-OB, 3X190 T LRF, 2X32 TPH sludge briquetting Plant, 2X50 TPD, Lime briquetting plant, Slag Atomizing Plant (GS Ball) **Capacity: 5.5 MTPA Liquid Steel**	• 1X190 T Convertor • 1X190T ARS • 2X190 T HMDS • 1X190 T TWIN LRF • 1X190 T RH-OB Capacity: 1.4 MTPA Liquid Steel	1X190 T CONARC twin Shell **3X190 T Convertor,** **3X190 T ARS** **6X190 T HMDS,** **2X190 T RH-OB,** 1X190 T CAS-OB, 3X190 T LRF **1X190 T TWIN LRF** 2x32 TPH sludge briquetting plant, 2X50 TPD Lime briquetting plant, Slag Atomizing Plant (GS Ball) **Capacity: 6.9 MTPA Liquid Steel**	Production increase will be achieved through operational changes and new facilities
Liquid Steel Production		**5.8 MTPA**	**1.51 MTPA**	**7.31 MTPA**	
7	**Casting Facilities**				

Sl. No.	Plant Unit /Particulars	Plant Unit Configuration/Capacity			
		As per EC dated 20-07-2012 and Subsequent EC Transfers, Amalgamation Amendments	**Addl. Under Present proposal**	**Final Capacity**	**Remarks**
a)	SMS-1 Casting Facilities	1 X 3 Strand Billet Caster 1X1 Slab Caster	-	• 1 X 3 Strand Billet Caster • 1X1 Slab Caster	Production increase will be achieved through process improvement
b)	SMS-2 Casting Facilities	• 3 x 1 strand Slab caster,	1 x 1 Strand Thin Slab Casting & Rolling (TSCR)	3 x 1 strand Slab caster, 1 X 1 Strand Thin Slab Casting & Rolling (TSCR)	**New facility**
Total Crude Steel Production		**5.6 MTPA**	**1.5 MTPA**	**7.1 MTPA**	
8	**Rolling Mills**				
a)	Hot Rolling Mill (Hot Strip Mill)	Reheating Furnace: 3x330 TPH, Roughing Mill: 2 Nos., Finishing Mill: 7 Nos. Down Coiler: 3 Nos. **Capacity: 4.992 MTPA**	Capacity: 0.258 MTPA	Reheating Furnace: 3x330 TPH, Roughing Mill: 2 Nos., Finishing Mill: 7 Nos. Down Coiler: 3 Nos. **Capacity: 5.25 MTPA**	Production increase will be achieved through process improvement
b)	Thin Slab Casting & Rolling (TSCR)	-	Capacity: 3.0 MTPA	**Capacity: 3.0 MTPA**	**New facility**
c)	Cold Rolling Mill (CRM)	Cold Rolled Steel Product: 0.35 Galvanized Steel Product: 0.225, Colour Coated Steel Product: 0.15, Hot Rolled Pickled & Oil Product: 0.1, Galvanized Steel Product (3rd Non-Ox Galvanized Unit Complex): 0.125) **Capacity: 0.95 MTPA**	-	Cold Rolled Steel Product: 0.35 Galvanized Steel Product: 0.225, Colour Coated Steel Product: 0.15, Hot Rolled Pickled & Oil Product: 0.1, Galvanized Steel Product (3rd Non-Ox Galvanized Unit Complex): 0.125) **Capacity: 0.95 MTPA**	No change
9	Captive Power Plant				
		10 x 55 TPH WHRB, 1X 120 TPH AFBC, 3 X 75 TPH AFBC(BFPP#I), 1 X 64 TPH WHRB of CDQ#1, 1X 94.5 TPH WHRB of CDQ#2, 1X250 TPH Gas fired Boiler,	• 1 x 250 TPH BF gas fired boiler • De-SOx Facility • De-Nox Facility **Capacity: 13 MW**	10 x 55 TPH WHRB, 1X 120 TPH AFBC, 3X 75 TPH AFBC(BFPP#I),incl. De-NOx facility 1X67.2 TPH WHRB of CDQ#I1 1X 95.4 TPH WHRB of CDQ#2,	J-13012/77/2011-IA.II (T) 12th February 2015

Sl. No.	Plant Unit /Particulars	Plant Unit Configuration/Capacity			
		As per EC dated 20-07-2012 and Subsequent EC Transfers, Amalgamation Amendments	**Addl. Under Present proposal**	**Final Capacity**	**Remarks**
		1X125 TPH Gas fired Boiler, 1X60 TPH Gas fired Boiler, 2x275 TPH CFBC Boiler (BFPP#II) surplus steam 280 TPH) 3x12 MW Black Start DG 1x16 MW BF-2 TRT **Capacity: 307 MW**		2X250 TPH Gas fired Boiler, 1X125 TPH Gas fired Boiler, 1X60 TPH Gas fired Boiler, 2x275 TPH CFBC Boiler (BFPP#II) surplus steam 280 TPH) 3x12 MW Black Start DG 1x16 MW BF-2 TRT 1x 7 MW BF-1 **TRT** **De-SOx Facility** **Capacity: 320 MW**	
Associated Facilities					
10	Lime & Dolomite Plant	4 x 300 TPD + 1 x 600 TPD kilns Capacity: 0.54 MTPA	• 1 X 600 TPD kiln Capacity: 0.16 MTPA	4x 300 TPD + **2 x 600 TPD kilns** **Capacity: 0.70 MTPA**	Capacity Upgradation and new facility
11	Oxygen Plant: Captive	1x150TPD 1x340 TPD 1x 405 TPD 1×1200 TPD 1×1120 TPD Capacity: 3215 TPD	• 2X1800 TPD Capacity: 3450 TPD	1x340 TPD 1x405 TPD 1×1200 TPD 1×1120 TPD **2X1800 TPD** **Capacity: 6665 TPD**	Removing: 1 x 150 TPD
12	Industrial By-products Management Division	Metal Recovery Plant: 300 TPH	Metal Recovery Plant with Oxy-lancing and Balling Facility: 350 TPH	**Metal Recovery Plant with Oxy-lancing and Balling Facility: 650 TPH**	Capacity Upgradation
		-	Steam Aging Facility: 12000 TPM	**Steam Aging Facility: 12000 TPM**	**New Facility**
		BF Slag processing plant: 0.87 MTPA	-	BF Slag processing plant: 0.87 MTPA	No Change
			Scrap processing facility: 1.0 MTPA	**Scrap processing facility: 1.0 MTPA**	**New Facility**

Table 2: Saleable Products of Existing Plant and After Expansion

Products	Existing (MTPA)	Additional (MTPA)	After Expansion (MTPA)	Remarks
Products				
HR Coils for sale	4.42	2.85	7.27	Increase due to Reheating furnace revamping + process optimization Processing of 1.645 MTPA purchased slabs
Cold Rolled products	0.95	-	0.95	No Change
Finished Steel	~5.4	2.85	~8.3	Increase is due to higher crude steel production and purchase of slabs
Billets & Slabs	0.40	-	0.40	No Change
Slabs for sale	0.13	-0.13	-	No sale of slabs is envisaged, as all slabs will be utilized in-house
By-products				
Granulated BF Slag	1.56	0.38	1.94	Increase of BF slag due to capacity upgradation of Blast Furnace from 5.0 to 6.25 MTPA
Coal tar	0.71	-	0.75	Increase in 0.15 MTPA in COB #2 will lead to a slight increase in by-products.
Sulphur	0.004	-	0.0045	Slight increase due to production increased in COB#1
Crude benzol	0.012	-	0.013	
Iron Oxide	0.004	-	0.004	No Change

The raw material requirement will increase from approximately 18.67 MTPA to 23.85 MTPA, with the majority of materials proposed to be transported by rail.

The total water requirement will increase from the present 64,404 m^3/day to 78,640 m^3/day, including the utilization of 6,240 m^3/day of CETP-treated water. The total recycled water is estimated at 24,072 m^3/day. The overall make-up water requirement remains within the existing permitted drawal from the Brahmani River (1,12,542 m^3/day).

The power demand will increase from 426 MW to 752 MW, which will be largely met through captive generation utilizing process gases. The project emphasizes resource efficiency and sustainability through waste recycling, zero effluent discharge (ZED), rainwater harvesting, solar power use and energy recovery systems such as TRT and waste heat recovery. A notable environmental initiative includes the transformation of a 25-acre ash mound into a biodiversity park after the acquisition by Tata Steel.

The estimated capital cost of the project is **₹13,250 crore**, with an EMP cost of **₹1,627** crore and annual recurring cost of **₹192 crore**. During construction phase the maximum employment generation will be ~6,000 persons and during operation permanent employment of 366 personnel and 700 contractual.

The project aligns with decarbonisation goals, targeting reduction in specific CO_2 emissions from 2.78 to 2.66 tCO_2/tcs by 2030 through measures such as process optimization, increased scrap use, energy recovery and efficient fuel utilization

4.0 BASELINE ENVIRONMENTAL STATUS

Baseline environmental data generation for air, water, noise, soil quality, and other environmental attributes within the study area (core and buffer zones) was carried out for one full season, covering three months of the summer season 2025 (March to May 2025).

In addition, one-month baseline monitoring for air, water, noise, soil quality, and traffic was conducted during March 2026 at the same sampling locations as monitored in summer 2025, in compliance with the ToR conditions. All baseline monitoring and analysis of these environmental attributes were carried out by the Environmental Engineering Laboratory of MECON Limited.

Micro-meteorological data: A micro-meteorological station was set up near the site to record hourly data during Summer 2025 and March 2026, covering wind, temperature, humidity, solar radiation and rainfall.

The area experiences typical pre-monsoon conditions with light to moderate winds (1.9–2.9 m/s), predominantly from the south-eastern sector. The maximum temperature in summer season reached up to 46.5°C, with moderate to high humidity and good solar radiation supporting atmospheric mixing. Rainfall during Summer 2025 was 232.7 mm (mainly in May), while none was recorded in March 2026. Calm conditions were limited (3.5–6.8%). Overall, meteorological conditions are favourable for dispersion with no abnormal variations observed.

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 PM_{10}, $PM_{2.5}$, SO_2, NO_2, NH_3, CO, O_3, Pb, Ni, As, benzene and Benzo(a)Pyrene (BaP) as prescribed by NAAQS 2009

Particulate matter (PM_{10} and $PM_{2.5}$) showed relatively higher concentrations compared to other pollutants. Mean PM_{10} levels ranged from 74 to 83 µg/m³ in 2025 and 79 to 90 µg/m³ in 2026, with a maximum concentration of 94 µg/m³ recorded at Nuahata (A6). Similarly, mean $PM_{2.5}$ concentrations ranged from 34 to 42 µg/m³ in 2025 and 39 to 46 µg/m³ in 2026, with peak values of about 51–53 µg/m³. The elevated particulate levels at A6 (Nuahata) are attributed to heavy vehicular movement and nearby industrial activities.

A clear seasonal variation was observed, with PM_{10} concentrations highest in March (77 to 94 µg/m³), followed by April, and lowest in May (61 to 83 µg/m³). The reduction in May is attributed to rainfall and improved atmospheric dispersion conditions.

Chemical characterization of PM_{10} indicates that the dominant elements follow the trend: Fe > Zn > Mn. The concentration ranges observed were Fe (0.679–2.662 µg/m³), Zn (0.671–1.215 µg/m³), and Mn (0.030–0.154 µg/m³), with the highest Fe concentration recorded at A6 (Nuahata). All measured metal concentrations were well within international benchmarks (Ontario Ambient Air Quality Criteria, April 2020). Slightly elevated levels near roads and industrial areas were noted; however, these do not pose any significant health concern.

Overall, the ambient air quality in the study area is within regulatory limits. Particulate matter remains the primary pollutant of concern, mainly influenced by transportation, mining activities, and dust emissions. No significant deterioration in air quality was observed between 2025 and 2026, indicating stable baseline environmental conditions

Ambient Noise levels: Ambient noise levels were monitored at ten (10) locations, the location N6 (Nuahata) is a "Commercial area", location N2 (Khaliberana) and N9 (Sanamunda) are in silence zone which were monitored near school and the remaining ambient noise locations falls under "Residential areas". The mean Leq noise levels at all the ambient locations are well within the respective norms of the type of area.

Traffic volume survey: Traffic Volume Survey (TVS) was carried out hourly and continuously at three locations, including both sides of NH-55 (four-lane) and the material gate road of TSM (two-lane). The survey was conducted for three days during Summer Season 2025 and for two days in March 2026. The recorded daily traffic volumes at all surveyed locations were found to be well within the respective design service volumes as per IRC standards. Based on the Level of Service (LoS) analysis, in Summer 2025, TVS1 and TVS3 were observed under LoS D, while TVS2 was under LoS C. A similar pattern was observed in March 2026, indicating no significant change in overall level of service conditions.

Water quality: Surface water quality was assessed at nine (09) locations covering upstream and downstream stretches of nearby water bodies during Summer 2025 and March 2026 to evaluate baseline conditions and potential impacts and compared with CPCB's Water Quality Criteria for Surface Water.

The results indicate that pH remained within the acceptable range (6.5–8.5) in both monitoring periods, while dissolved oxygen levels (4.0–6.1 mg/l) were adequate to support aquatic life. Based on CPCB criteria, most upstream locations (SW1, SW3, SW4, SW5, SW6)

fall under Class B (suitable for outdoor bathing), whereas downstream and pond locations (SW2, SW7, SW8, SW9) fall under Class C due to relatively higher coliform levels.

Comparison between 2025 and 2026 indicates no major deterioration; in fact, several parameters such as TDS, chloride, and sulphate showed improvement in 2026. Overall, surface water quality in the study area meets CPCB criteria, with minor localized impacts observed at downstream and stagnant water locations, highlighting the influence of anthropogenic activities

Eight (08) groundwater samples were collected during the post monsoon season 2022. The results have been compared with drinking water norms of IS: 10500 (2012), Amendment No. 4, 2021.

The results indicate that all the ground water quality parameters analysed to assess the ground water quality in study area meets the prescribed norms in all ground water samples. Some parameters exceeded the "Acceptable Limits" but were within the "Permissible Limits". Groundwater quality in March 2026 is largely consistent with Summer 2025, showing only minor seasonal variations. Overall, no significant deterioration is observed, but groundwater remains mineralized and requires treatment for drinking purposes.

Soil: Soil quality was assessed at eight (08) locations during the monitoring season. The analysis indicates that soil pH in the study area ranges from 5.43 to 7.67 in Summer 2025 and 6.01 to 7.99 in March 2026, reflecting conditions from moderately acidic to slightly alkaline, with a few acidic patches.

Macronutrient analysis shows nitrogen levels in the medium to high range, with improvement observed in 2026. Potassium levels are also in the medium to high range, while phosphorus remains consistently low across all locations, making it a key limiting nutrient. Organic carbon content is low in all samples, indicating another major constraint to soil fertility.

A comparison between 2025 and 2026 indicates an improvement in nitrogen levels and overall soil health, while phosphorus and organic carbon continue to remain low. Overall, the soils are moderately fertile, structurally stable, and suitable for agriculture and greenbelt development, with primary limitations being low phosphorus and organic carbon.

In conclusion, the soils in the study area are agriculturally suitable with good physical and chemical properties, but require targeted nutrient management for sustained fertility and long-term productivity.

Ecology-biodiversity: The flora and fauna within the 10 km study area under Angul and Dhenkanal Forest Divisions were documented through field surveys, consultations with Forest Department officials, and review of working plans and published literature, supplemented by inputs from local communities. Vegetation assessment was carried out using quadrat sampling (10 m × 10 m) at representative locations considering terrain, vegetation density, and proximity to the project site. Field surveys were conducted during March–May 2025 during peak activity hours to capture species diversity effectively.

A total of 114 plant species belonging to 53 families were recorded, comprising 53 trees, 20 shrubs, 13 climbers, 20 herbs, 5 grasses, and 3 bamboos, indicating moderate floral diversity. The area includes 61.48 ha of Revenue/DPF forest land, for which prior forest clearance has

been obtained. Species such as Shorea robusta showed highest dominance, followed by Artocarpus heterophyllus, Ficus benghalensis, Tectona grandis, and Terminalia alata.

Faunal assessment identified various species within the study area, including reptiles such as land tortoise (Testudo elongata) and water turtle (Lissemys punctata), indicating the ecological significance of the region.

Based on primary surveys and secondary data, a total of 41 terrestrial fauna species were recorded in and around the project area, including 15 mammals, 10 reptiles, and 19 avifauna species. Mammals include species such as Asian Elephant, Jungle Cat, Jackal, Indian Fox, civets, mongoose, and primates, falling under Schedule I and II of the Wildlife (Protection) Amendment Act, 2022, while some species are unlisted.

The Jharhabandh and Nimidha Reserve Forests in Dhenkanal district, near Meramandali, host a rich variety of wildlife including elephants, which are the main drivers of human-wildlife conflict. Increasing human activities from nearby settlements and industries have intensified these interactions, particularly within a 10 km radius.

As Schedule-I species are present within the 10 km radius study area, a Site-Specific Wildlife Conservation Plan (SSWCP) is been prepared based on the Wildlife (Protection) Act, 1972 (as amended in 2022). The SSWCP is under preparation and will be submitted by TSM to the Forest Department, Odisha, for approval. The plan includes conservation measures for Schedule-I fauna along with a defined budget and action plan

Socio-economic environment: A detailed socio-economic baseline study was conducted within a 10 km radius of the project site covering 169 villages and 3 towns across Angul and Dhenkanal districts. The study, based on both primary surveys and secondary data (Census 2011 and other sources), indicates that the area is predominantly rural, with a population of about 2.39 lakh (2011), projected to 2.64 lakh. The literacy rate is around 71%, with moderate gender disparity, and Scheduled Castes and Tribes constitute a significant portion of the population.

The occupational structure shows that about 35% of the population is engaged in work, while a large proportion comprises non-workers, indicating scope for employment generation. Infrastructure in terms of education and healthcare is moderate, with facilities broadly meeting standards, though gaps in amenities exist. Health issues such as diabetes, hypertension, respiratory ailments, and vector-borne diseases are prevalent.

The field survey covering 14 villages highlights that the population is mainly in the working-age group, with improving educational trends and moderate quality of life. Overall, the study area has basic socio-economic stability, with opportunities for improvement through targeted interventions in employment, healthcare, education, and infrastructure development..

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 total land area of Tata Steel is 673.62 ha, including 644.947 ha for the existing steel plant and 28.676 ha for the TSM-CPP (erstwhile AEL). About 67.42 ha of vacant land within the existing premises of existing steel plant will be used for expansion, along with 229.44 ha of additional adjacent land for infrastructure and greenbelt development. No change in land use is envisaged for the existing land, as the area is already designated for industrial purposes, though permanent changes in land cover and topography will occur due to construction.

Of the additional land, around 60% will be developed as greenbelt and 40% for infrastructure. The land mainly comprises barren and single-crop agricultural land and is being acquired through IPICOL, including both private and government land.

A seasonal nallah, Kisinda Nala, flows through the site and which is not diverted and will not be diverted; necessary approvals are under process, and conservation measures have been planned which is addressed. All activities will remain within project boundaries, with no expected impact on surrounding land use. Temporary impacts during construction are minimal as most labour will be locally sourced.

Overall, the project will enhance land use through greenbelt development over 218.597 ha (25% of total area), in compliance with regulatory requirements.

Impacts on ambient air quality: 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 PM, SO_2 and NO_x. 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 well within the NAAQS norms under normal conditions.

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. Road sweeping machines shall be deployed additional for collecting of fugitive dust accumulated on roads. Dust screens shall be erected to attenuate fugitive dust. Emissions PM from all stacks shall be restricted to <30 mg/Nm^3 by use of DE system. Fume extraction hoods in smelter and Secondary gas collected and treatment system shall also ensure control of secondary emissions from the process. Relatively clean fuel BF Gas, LD Gas and Coke Oven gas have been envisaged as primary fuels in the plant. The storage of coal the raw materials has been envisaged in covered yards.

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 Screens and crushers, high speed blowers of the furnaces, operation of high-speed compressors in oxygen plant, operation of

turbines in power plant, operation of high-capacity water pumps, venting of high-pressure steam, in-plant vehicular movement, operation of mills, handling of heavy pieces of semi-finished and finished products, operation of emergency DG sets 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 proposed plant include technological measures for reduction of noise at source.

Impact on road and traffic: The incremental traffic during operation of the plant shall include trucks traffic for raw material and product movement and movement of employees by buses, cars and two-wheelers. The analysis of incremental traffic during operation phase on the existing traffic volume indicates that the enhanced traffic on the road after implementation of the proposed project will increase by 2% over the existing traffic levels which is well within the Design Service Volumes; The Level of Service (LoS) of the Highways, which is already Class D, shall remain unaffected even after the increased traffic from the expanded plant.

Impact of Surface water resources and quality: The plant draws makeup water from Brahmani river. The drawal of water from Brahmani River shall not exceed the amount for which permission has already been obtained from the Sate Govt. for the existing plant. Further, the plant has been designed for Zero effluent discharge with maximum recycling and reuse of treated wastewater and conservation of freshwater resources. Since no wastewater shall be discharged outside the plant premises except rainy days, no adverse impact on nearby surface water bodies is anticipated.

Kisinda Nallah is a seasonal natural drain flowing through the TSM area and remains undisturbed as per previous Environmental Clearance conditions, with no effluent discharge. TSM has developed supporting public infrastructure and green spaces while preserving the nallah. Monitoring results of upstream and downstream of Kisinda nallah (2025–2026) show stable water quality within CPCB Class B standards, indicating no impact from plant activities. Additional conservation plan focuses on maintaining natural drainage, controlling erosion, improving infiltration and enhancing ecological stability. Measures include plantation, desilting, sediment control, and regular water quality monitoring. Nearby water bodies like Lingara Nalla and Rengali Canal are also protected through Zero Effluent Discharge and periodic monitoring.

Impact of Groundwater resources and quality: The existing plant does not abstract groundwater, and no groundwater abstraction is envisaged for the proposed expansion project. Periodic groundwater quality monitoring in villages surrounding the plant boundary will continue to be carried out after the expansion.

Impact on terrestrial and aquatic habitat: Expansion of the existing plant shall lead to clearance of existing vegetation in the existing premises. As a standard practice, in case of tree felling shall be carried out only after obtaining due approval from the Forest Department and other competent authorities The clearance of the vegetation will be compensated by developing a thick green belt along the boundaries of the expansion are which shall contain more trees & vegetation than what will be cleared for the expansion project.

The ecology of the nearby nallahs and Brahmani River within the study the area is also expected to remain unaffected due to the proposed expansion programme as no discharges to nallahs and River are envisaged from the plant.

Impact on Socio-economic environment: TSM's proposed expansion of their existing steel plant shall have long-term impacts over the socio-economic condition of the 10 km radius study area. The land for area for the proposed expansion is under acquisition through the IPICOL, State Government. The proposed land does not have any habitation and hence no displacement of any population in anticipated. A need-based social-impact study has been carried out within the study area, wherein the socio-economic condition of the area reflected that the people are interested in strengthening of Clean Drinking water facilities, Skill development of youth, Support in sports activities, Health Infrastructure, Educational Infrastructure, Network connectivity, Development of Anganwadis, Road and Transportation, Agricultural development and Sanitation facilities.

Various developmental activities under TSM's CSR initiatives will be implemented during the establishment and operation of the plant. These will be further strengthened through management measures proposed under Corporate Environmental Responsibility (CER) and environmental safeguards, covering all villages within 0–3 km and beyond 3 km of the project area.

6.0 ANALYSIS OF ALTERNATIVES

The total land area of Tata Steel is 673.62 ha, comprising 644.947 ha for the existing 5.6 MTPA steel plant and 28.676 ha for the TSM-CPP (erstwhile AEL). Out of the 644.947 ha of the steel plant area, 67.42 ha of vacant land is available within the premises, which will be utilized for the proposed expansion of units. Additional adjacent land will be used for supporting infrastructure and greenbelt development.

A comprehensive technological assessment was carried out for thoroughly examining various technical options for the proposed expansion facilities, focusing on parameters including energy efficiency, productivity, environmental friendliness and keeping in consideration the space as well as logistic constraints for implementation of various technological options. After a thorough analysis, the following technologies selected for the proposed facilities as given in **Table 3.**

Table 3: Selected technologies for proposed expansion facilities

Plant Unit	Selected Technology	Technology Rationale	Remarks
Coke Making	Coke Oven Batteries (COB) – By-product recovery type	• Capacity enhancement in COB #1 through debottlenecking and optimization • Existing technology retained due to proven efficiency and compliance	• Recovery of tar, ammonia, and gas • Energy efficient with lower emissions vs. non-recovery ovens • Requires strict O&M practices
DRI Plant	Coal-based Rotary Kiln DRI	• Capacity increase via kiln optimization • Suitable for non-coking coal and integration with steelmaking	• Flexible operation with Indian raw materials • Higher CO_2 emissions vs. gas-based DRI • ESP upgradation to bag filters proposed
Sinter Plant	Straight Grate Sintering	• Capacity enhancement through process optimization and improved raw mix utilization • Proven and reliable technology	• Better BF productivity and waste recycling • Dust and gaseous emissions require robust APC systems • DE systems proposed at key emission points
Steel Production	Blast Furnace (BF) – Basic Oxygen Furnace (BOF)	• Preferred over alternatives due to high productivity and compatibility • Expansion includes BF volume increase, 3rd BOF, and scrap usage (TSCR integration)	• High output and consistent quality • Carbon intensive vs. EAF • DE systems proposed across major emission sources
Casting & Rolling	Continuous Casting with CSP/TSCR	• • Selected over ingot casting for higher yield and efficiency• Addition of 1 × 1 Strand TSCR (3.0 MTPA)	• Improved product quality and reduced reheating • Enhanced operational flexibility
Hot Rolling (HSM)	Reheating Furnace Revamp + Optimization	• Capacity increase through modernization and process improvements • Capability to process purchased slabs	• Improved fuel efficiency and throughput • Dependent on upstream quality
Lime & Dolomite Calcination	Twin Shaft Vertical Kilns	• Addition of 1 × 600 TPD kiln • Selected over rotary kiln for higher efficiency and lower fuel consumption	• Uniform product quality • Lower fuel usage • DE system proposed
Oxygen Plant	Cryogenic Air Separation Unit (ASU)	• Addition of 2 × 1800 TPD units • Selected for high purity and efficiency	• Reliable large-scale operation • By-products (N_2, Ar) enhance resource utilization
Captive Power Plant	BF/Process Gas-based Power Generation	• 1 × 250 TPH BF gas-fired boiler proposed • Efficient utilization of waste/process gases	• Reduced external power dependency • Lower emissions and improved energy efficiency

Plant Unit	Selected Technology	Technology Rationale	Remarks
IBMD	Slag Processing, Metal Recovery & Scrap Processing	• Expansion of metal recovery • 1.0 MTPA scrap processing (Steel Scrap Policy, 2019) • LD slag steam aging facility	• Promotes circular economy • Improved slag utilization and stabilization

The selected site provides significant logistical and economic advantages while minimizing land disturbance as the expansion is largely confined to the existing premises. Accordingly, no alternative sites have been considered. The selected technologies are efficient utilization of existing infrastructure with minimal environmental impact. Therefore, no significant alternative technologies are considered necessary, as the proposed configuration is the most feasible, efficient and environmentally sustainable option.

7.0 ENVIRONMENTAL MONITORING PROGRAMME (EMP)

To ensure effective implementation of proposed mitigation measures, elaborate arrangements are envisaged by TSM 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 solid wastes: One (01) Micro-meteorological station for continuous monitoring of site-specific meteorological parameters within the plant. Seven Continuous Ambient Air Quality monitoring stations (CAAQMS) have been set up around the plant.

Continuous Emission Monitoring Systems (CEMS) have also been installed for all process stacks of the existing plant. Similar systems shall be installed at the additional units also.

Work zone air quality is being monitored at 12 locations in the existing plant once every month. Additional locations in the expansion area shall be included in the work zone air quality monitoring programme.

Ambient noise levels are being monitored at four locations at the plant boundary on monthly basis. Work zone noise levels are monitored at ten locations once every month. Additional locations in the expansion area shall be included in the work zone noise level monitoring programme.

No effluent shall be discharged from the proposed plant after implementation of the proposed expansion into surface or ground water. All effluents will be treated and reused in the plant. At present, monitoring of treated wastewater is carried out at Twelve (12) locations covering the inlet and outlet of major units, and at twenty-eight (28) additional locations across various process units. Sewage Treatment Plant (STP) performance monitoring is conducted at three (03) locations, covering inlet and outlet points. This monitoring is undertaken in consultation with the State Pollution Control Board, and the monitoring reports are submitted periodically to regulatory authorities—once every three months to the State Pollution Control Board, once every six months to the Ministry of Environment, Forest and Climate Change (MoEF&CC),

and monthly to the Central Pollution Control Board (CPCB) as part of environmental monitoring compliance reports.

Inventorization of all major solid and hazardous wastes is being done in the existing plant, which will also be done after implementation of the proposed expansion. Maximum re-cycling and utilization of generated waste is being done presently at TSM Plant. Additional Hazardous wastes are sold to Hazardous waste recyclers or TSDF operators.

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, 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 steel plant. Storage facilities of hazardous materials are envisaged in the proposed project. The primary hazardous materials include Blast Furnace Gas, LD Gas and Coke Oven Gas. 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 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 pipelines of these gases and catastrophic rupture of gas storage tanks shall be limited within 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 Study

Socio-economic survey was undertaken in all the villages identified in the study area. The unit of population like, Literate, illiterate, employed, unemployed, old age, youths, males and females were included in the survey.

A need-based socio-economic impact assessment of the study area has been done starting with scoping of issues related to potential significance like educational status, health infrastructure, drinking water facility, employment and income etc. The baseline condition of the area has been profiled by various socio-economic indicators including availability of educational and health infrastructure around the study area. Also, the quality of life of the study area populace has been measured based on information collected during field survey. The information gathered by the analysis of primary and secondary data has been used for identifying possible socio-economic impacts.

The people perception survey during the field study indicates an overall optimistic outlook towards the proposed project and its associated CSR activities of TSM. Around 64.4% of respondents expressed optimism regarding infrastructural development in the area, while 54.8% anticipated improved employment opportunities due to the project expansion. Positive expectations were also observed in relation to business growth, as well as improvements in educational and healthcare facilities.

The assessment further suggests that the project is not expected to adversely affect existing agricultural practices and may instead provide supplementary income to farmers. It is also perceived to generate strong positive effects on employment, income levels, and consumption through multiplier impacts, along with promoting skill diversification due to increased industrialization in the surrounding area. The CSR initiatives are expected to significantly enhance socio-economic conditions and support community development in the study area.

However, some concerns were noted regarding potential health impacts, particularly air pollution-related diseases. Overall, the project is viewed as having a largely positive socio-economic impact on the local population, with notable benefits in development, income generation, and community welfare.

Environmental Safeguard and Epidemiological Study

The study provides a Village-wise Environmental Safeguard and Mitigation Plan for the Tata Steel Meramandali plant, focusing on areas within a 3 km radius and beyond, primarily in Dhenkanal and Angul districts, Odisha. A total of 25 villages are located within the 3 km radial zone, while 143 villages including Census Towns (CT) are situated beyond the 3 km radius It assesses environmental sensitivities and recommends mitigation measures for affected villages, educational institutions, hospitals, places of worship, and water bodies. The report aims to identify sensitive receptors, assess potential impacts from ongoing and proposed projects, and ensure protection of natural drains. The findings are intended to enhance environmental management and promote sustainable operations in compliance with updated regulations.

A detailed survey on environmental safeguard and baseline health assessment for Tata Steel Meramandali (TSM).

The health study covered 790 households across (3 km radius) using a statistically robust survey framework. The study indicates a shift towards a dual disease burden, with non-communicable diseases (45.8%) such as hypertension and diabetes becoming dominant, alongside communicable diseases (21.1%). Maternal and child health indicators are strong, with high ANC coverage and institutional deliveries, though child immunization (71%) needs improvement. While public healthcare facilities are widely used, over 50% households face access challenges, mainly due to distance and medicine shortages. Overall, the findings highlight the need for strengthening healthcare access and addressing rising lifestyle-related diseases in the project area

A total budget of **₹85 crore** has been proposed over a 5-year period for villages within 0-3 km, emphasizing long-term and sustainable development rather than short-term CSR interventions.

- The plan begins with baseline socio-economic assessments (₹0.7 crore) to enable data-driven planning and impact evaluation.
- The environment sector (₹17.4 crore) focuses on addressing pollution, biodiversity loss, and water scarcity through large-scale plantation (1.5 lakh trees), rainwater harvesting, renewable energy initiatives, and water conservation structures such as ponds and check dams.
- The public health sector (₹27.4 crore), being the highest allocation, prioritizes reduction of disease burden through mobile health units, expansion of healthcare infrastructure, screening programs, and support for critical care, thereby improving healthcare access and strengthening the rural health system.
- In the education and skill development sector (₹10.9 crore), interventions such as STEM learning centres, scholarships, training programs, and infrastructure upgrades aim to enhance literacy and employability.
- The livelihood sector (₹2.5 crore) focuses on income generation through support to farmers, climate-resilient agriculture, and women-led enterprises, targeting improved household incomes and formation of farmer institutions.
- The community infrastructure component (₹9.2 crore) includes development of roads, drinking water facilities, sanitation, and community assets to improve overall quality of life.
- Further, governance and inclusion initiatives (₹0.7 crore) aim to strengthen local institutions and promote women's participation in decision-making.
- Additionally, a significant allocation of ₹16.2 crore has been proposed for integrated model village development, focusing on holistic improvement of selected villages through convergence of health, livelihood, infrastructure, and environmental interventions.

A separate budget of **₹10 crore** has been kept for the villages beyond 3 km.

Overall, the plan adopts a multi-sectoral and integrated approach, with major investments in public health, environment, and model village development. It aligns with sustainable development goals (SDGs) and regulatory requirements, ensuring that the proposed expansion contributes to inclusive, balanced, and sustainable regional development, benefiting a large population within the study area.

Even prior to the public hearing, Tata Steel Meramandali has committed to providing essential services, particularly in the health sector, across all villages. The allocated budget further reflects its strong commitment to societal development alongside its growth

Public Consultation

The Environmental Public Hearing (EPH) details shall be furnished after the public hearing is conducted and the proceedings are received from the Odisha State Pollution Control Board (OSPCB).

9.0 PROJECT BENEFITS

The proposed expansion project is expected to boost the local economy through both direct and indirect employment during the construction and operation phases.

During the construction phase, around 3,000 to 6,000 people will be engaged at the site. It is estimated to generate approximately 350 direct and 700 indirect employment opportunities during operation period.

Socially, TSM, through its CSR initiatives, will continue to enhance healthcare, education, infrastructure, and livelihood opportunities in nearby communities. The project will support peripheral development, skill development, improved civic amenities, and overall quality of life. TSM has allocated **~₹97 crores** towards Corporate Social Responsibility over the last five years (FY 2021–26) for improving physical infrastructure in the surrounding areas.

10.0 ENVIRONMENTAL COST BENEFIT ANALYSIS

The proposed expansion project involves pollution control investment for air and water of **₹1559** crore and annual recurring cost of **₹103 crore**. PM control meets 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)

TSM is committed, as a responsible corporate entity, towards protection of environment and the community and 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 and conveyors will be employed for materials transportation to minimize environmental effects. Additionally, greenbelt will be developed and maintained to reduce noise disturbances. Construction activities will be restricted to daytime hours to further limit potential disruptions. Water sprinkling will be routinely conducted to reduce particulate matter (PM) concentrations in the atmosphere, 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, TSM will uphold a comprehensive environmental management plan specific to the plant. This plan encompasses a wide range of environmental 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 and amendment thereof. Noise levels within the plant premises will undergo regular monitoring to maintain them within permissible limits, thus reducing noise pollution.

An amount of **~₹1627 Crores** is earmarked as capital cost for EMP implementation. Additionally, **~₹192 Crores** will be budgeted annually for the meeting the operation and maintenance costs of the EMP measures, ensuring their continued effectiveness in environmental protection.

Environment Management Department (EMD) looks after the environmental activities of the existing steel plant. EMD 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 EMD. Also, TSM's commitment to protection of the environment is reflected in the 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 to minimize environmental impacts and promote responsible environmental stewardship throughout the project's lifecycle.

12.0 SUMMARY AND CONCLUSION

TSM proposal for expansion of the existing Integrated Steel Plant located at Meramandali, Dhenkanal district, Odisha 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 environment through special safeguard planned for each village within 3 km and also the study area and society due to the proposed project.

In the design of the proposed expansion units, latest state-of-art technology has been envisaged 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 Effluent Discharge" concept. Wastewater generated at the plant will be treated in Effluent Treatment Plant (ETP) and recycled back in the process. 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 secondary 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 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.