

# ***Environmental Impact Assessment***

***For***

***Proposed Expansion of Steel Melting Plant from 1,42,200 TPA  
(MS Ingots of 41,400 TPA, MS Billets of 1,00,800 TPA) to 2,88,000  
TPA of MS Billets and 2,50,000 TPA of TMT Bars***

***At***

***SIPCOT Industrial Complex, Pappankuppam Village,  
Gummidipoondi Taluk, Tiruvallur district, Tamil Nadu***

**EXECUTIVE SUMMARY**



***Project Proponent***

**M/s. ARS Steels & Alloy International Pvt. Ltd  
Chennai**



***EIA Consultant***

**M/s. Vimta Labs Limited  
Hyderabad / Coimbatore  
QCI/NABET Accredited EIA Consultant**

**SEPTEMBER 2019**



## **1.0 INTRODUCTION**

ARS Steels & Alloy Private Limited proposes to expand their manufacturing capacity of Steel melting plant from 1,42,200 TPA (MS Ingots of 41,400 TPA, MS Billets of 1,00,800 TPA) to 2,88,000 TPA of MS Billets and 2,50,000 TPA of TMT Bars. The existing plant site is located at plot no B-1/S, 39-52, B1/S part, SIPCOT Industrial Complex, Pappankuppam Village, Gummidipoondi Taluk, Tiruvallur District, Tamil Nadu. The existing plant has a manufacturing capacity of MS Ingots of 41,400 TPA, MS Billets of 1,00,800 TPA and TMT Bars 2,50,000 TPA. The Consents of Billet division and Rolling Mill has been renewed up to date.

The proposed expansion features increasing the manufacturing capacity of MS Billets 1,00,800 TPA to 2,88,000 TPA. The proposed manufacturing capacity would be achieved by replacing 2 x 8 MT by 1x25 MT of the induction furnace with the existing 1x 25 MT furnace. The Virgin scrap, Sponge iron and Ferro alloys are melted in the induction furnace at 1600°C. The molten metal from the induction furnace is poured into the continuous casting machine in order to produce the billets. Further, the hot sized billets are directly charged into rolling mill by the adoption of Direct Hot Rolling Technology to produce Rerolled products (TMT bars). Consumption of coal will be reduced up to 95% in the proposed expansion activity. MS Ingots production would be completely stopped and No Billets would be procured from the local market in the proposed activity. The estimated total cost for the proposed expansion is Rs. 5.9 Crores.

### **Project Scoping Category**

As per the Environmental Impact Assessment Notification dated 14<sup>th</sup> September 2006 and subsequent amendments, the proposed expansion project falls under the Schedule No. 3(a) [Metallurgical Industries-Ferrous and Non-ferrous] and categorized as "**Category B1**" for which the Environmental Clearance (EC) from the State level Environmental Impact Assessment Authority (SEIAA) is required.

The Terms of Reference (ToR) has been obtained for the expansion of Steel Melting Plant from 1,42,200 TPA to 2,46,960 TPA vide letter No. **SEIAA-TN/F.No. 6443/2017/3(a)/ARS/ToR-494/2018 Dated: 08.06.2018.**

Further, The amendment has been proposed in existing Terms of Reference (ToR) from 2,46,960 TPA to 2,88,000 of MS Billets. The project was considered in the 129th SEAC (Industry-I) meeting held on 18th May, 2019 and received ToR vide letter No. **SEIAA-TN/F.No. 6443/2017/3(a)/ARS/ToR-494/2018 Dated: 17.06.2019** and the EIA report has been prepared in line with the ToR conditions obtained.

As per the direction of the District Environmental Engineer, Gummidipoondi, Tamil Nadu Pollution control board, Project proponent has requested for amendment in ToR for the inclusion rolling mill of manufacturing capacity of 2,50,000 TPA of Re-rolled products in the existing proposal. The amendment in ToR was placed in the 352nd SEIAA meeting held on 19.08.2019 and received ToR vide letter No. **SEIAA-TN/F.No. 6443/2017/3(a)/ARS/B/ToR-494/2018 Dated: 19.08.2019.** Expect the proposal of inclusion of rolling mill, all other Terms of Reference stipulated in the TOR dated 08.06.2018 remains unaltered.

## 1.1 Location of the Project

The existing plant site is situated at SIPCOT Industrial Complex, Peddikuppam Village, Gummidipoondi Taluk, Tiruvallur District, Tamil Nadu. The existing plant is 0.4-km away from Kayalarmedu in North East Direction. The nearest highway to the plant is NH-5 which connects Guntur-Chennai at 0.7 km in East direction. The nearest Railway station to the plant site is Gummidipoondi Railway station which is located at a distance of 2.2 km in SE direction. The nearest airport is Chennai International airport at a distance of 46.7 km in South direction.

The existing industry comprises a land area of 4.51 ha (11.14 acres). The proposed expansion activities will be carried out within the existing industrial premises itself. Therefore no additional land will be acquired for the proposed expansion. The Index map and the study area map of 10 km radius is shown in **Figure - 1.1** and **Figure - 1.2** respectively. Aerial view of the existing plant site is shown in **Figure - 1.3**. The details of environmental setting are given in **Table - 1.1**.

**TABLE - 1.1**  
**ENVIRONMENTAL SETTING OF THE PLANT SITE (10 KM RADIUS)**

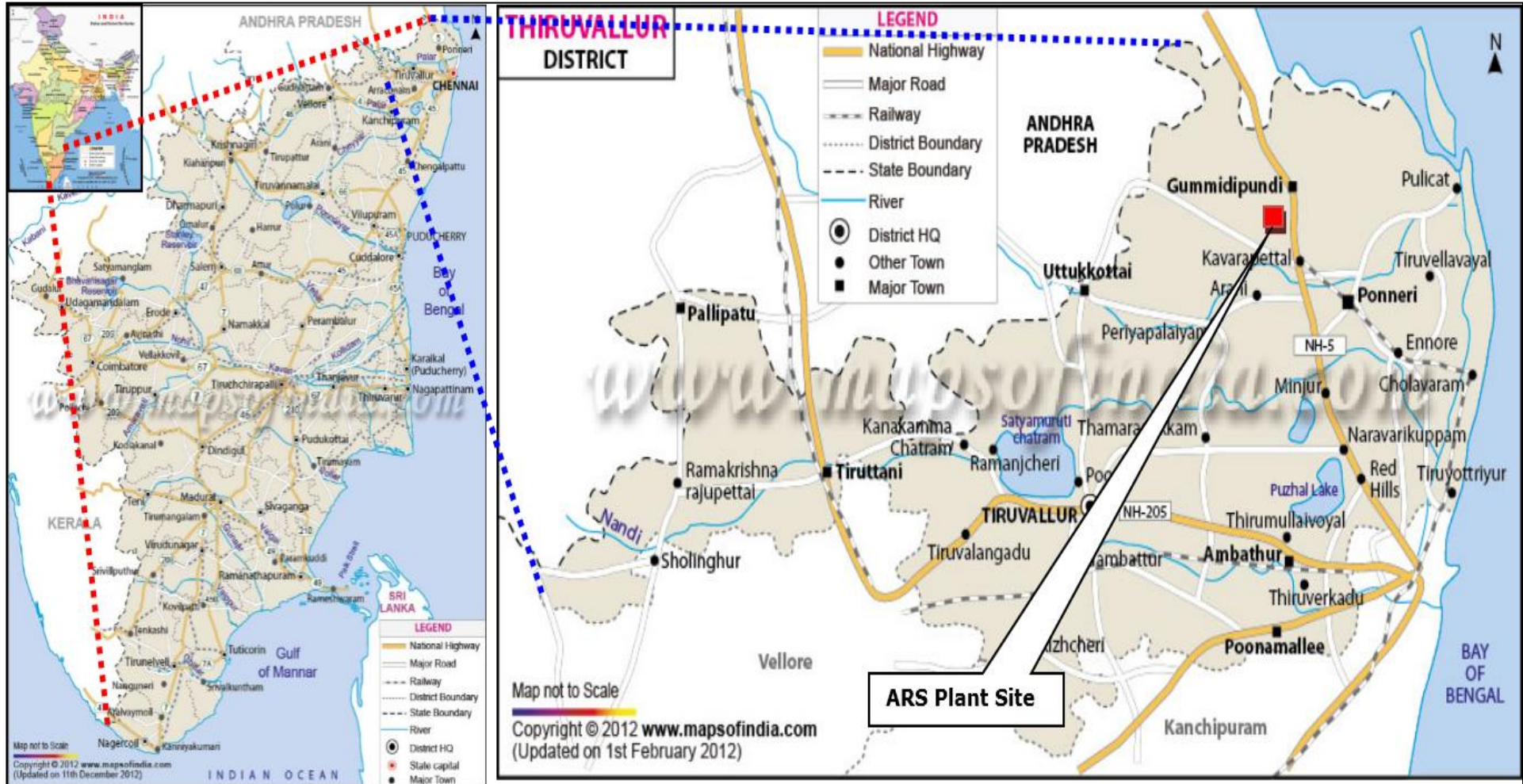
Sr.No	Particulars	Details		
		Sr.No	Latitude	Longitude
1	Site Co-ordinates	A	13° 25.432' N	80° 6.426' E
		B	13° 25.422' N	80° 6.549' E
		C	13° 25.349' N	80° 6.555' E
		D	13° 25.353' N	80° 6.516' E
		E	13° 25.254' N	80° 6.494' E
		F	13° 25.261' N	80° 6.411' E
2	Elevation above MSL	19 m		
3	Land use of the project site	Industrial Land use Zone (SIPCOT,Gummidipoondi)		
4	Nearest Highway	NH- 5 (0.7 km, East)		
5	Nearest Railway Station	Gummidipoondi R.S. (2.2 km, SE)		
6	Nearest Air Port	Chennai Intl. Airport (46.7 km, S)		
7	Nearest Sea Port	Ennore (30.3 km, SE)		
8	Nearest habitation	Kayalarmedu (0.4 km, NE)		
9	Nearest major town	Gummidipoondi (1.7 km, S)		
10	Ecologically sensitive zone (Wild Life Sanctuaries)	Pulicat Ecosensitive Zone (6.48 km, N)		
11	Reserved Forests	Puliyur forest R.F (6.8 km, W) Manali R.F (9.8 km, SW)		
12	State, National boundaries	Andhra Pradesh – Tamil Nadu (7.4 km, N)		
13	Defence Installation/Historical Monuments/Archaeological places	Nil in 10 km radius		
14	Historical places	Nil in 10 km radius		
15	Socio-economic factors	No resettlement and rehabilitation involved		
16	Nearest river & water body	Thamarai Eari - 1.7 km, ESE Sri Amman Temple pond - 2.2 km, SSE Murugan Temple pond - 2.4 km, SE Siva Temple pond - 2.6 km, SSE		



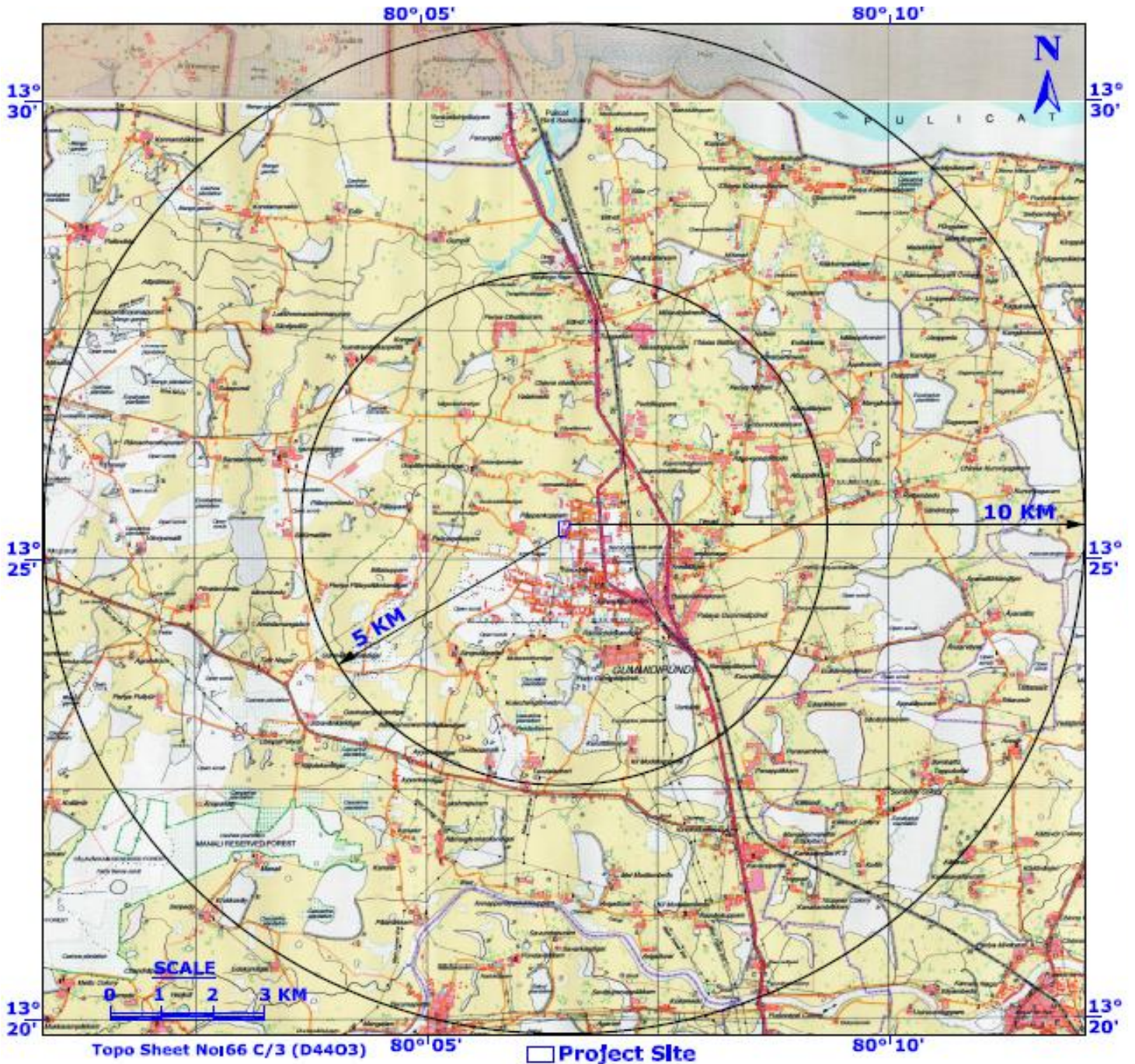
**Environmental Impact Assessment for the Proposed Expansion of Steel Melting Plant from 1,42,200 TPA (MS Ingots of 41,400 TPA, MS Billets of 1,00,800 TPA) to 2,88,000.0 TPA of MS Billets and 2,50,000 TPA of TMT Bars at Pappankuppam Village, SIPCOT Industrial Complex, Gummidipoondi Taluk, Tiruvallur District, Tamil Nadu**

**Executive Summary**

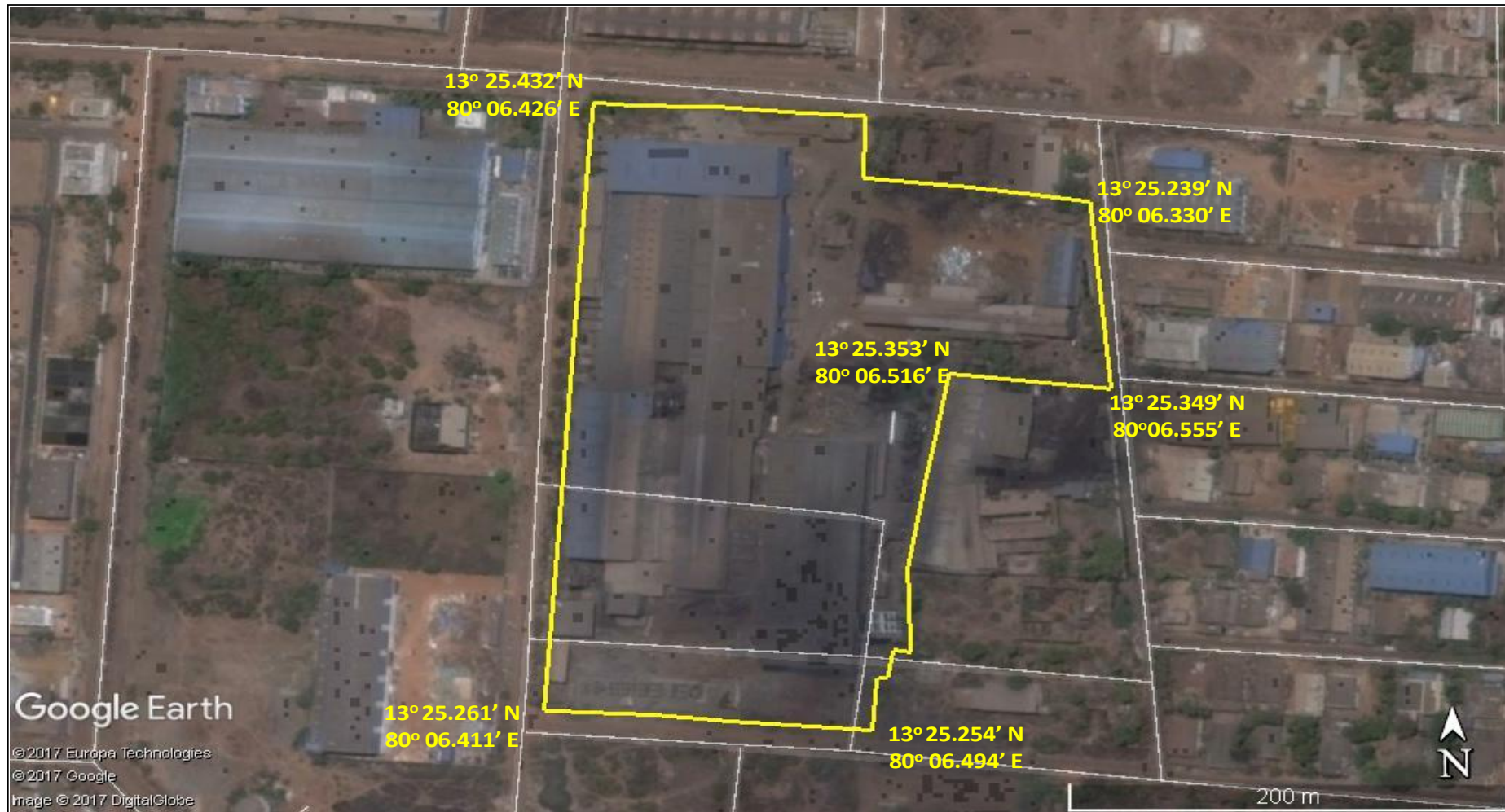
<b>Sr.No</b>	<b>Particulars</b>	<b>Details</b>
		Eddappalayam lake - 6.2 km, SE Pulicat lake - 6.39 km, NNW Rakkampalayam lake -7.1 km, NE Arani River -7.2 km, S Paatupalli lake - 7.6 km, E Poo-Vilambedu Pond - 8.5 km, W Kattavour Eari - 9.5 km, SE
17	Nearby Industries	1) M/s. Manchu Toughened Glass Ltd(0.05 km, W) 2) M/s.Dalmia Research Lab (0.07 km, NW) 3) M/s Claro India Ltd (0.1 km SSE)
18	Nearby Fire Station	Therauli Fire Station (2.8 km, E)
19	Nearby Hospitals	1) ESI Hospital (1.66 km, ESE) 2) Frontier Mediville (1.70 km, SSE) 3) SDK Hospital (1.90 km, E) 4) Government Hospital, Gummidipoondi (2.48 km, E)



**FIGURE - 1.1  
INDEX MAP**



**FIGURE - 1.2**  
**STUDY AREA MAP**



**FIGURE - 1.3**  
**AERIAL VIEW OF THE EXISTING PLANT**



## 1.2 Project Details

### 1.2.1 Manufacturing Details

The proposed expansion involves manufacturing of MS billets of quantity 1,00,800 TPA to 2,88,000 TPA and TMT Bars of 2,50,000 TPA. The details of existing manufacturing capacity and after expansion are listed in **Table - 1.2**.

**TABLE - 1.2**  
**DETAILS OF MANUFACTURING CAPACITY**

Sr. No.	Products	Existing (TPA)	After Expansion (TPA)
1	<b>Furnace division:</b> MS Ingots	41,400	---
2	<b>Billet division:</b> MS Billets	1,00,800	2,88,000
3	<b>Rolling Mill:</b> TMT Bars	2,50,000	2,50,000

Source: ARS, Gummidipoondi

### 1.2.2 Land Requirement

The total land area required for the proposed expansion activities will be 4.51 ha (11.14 acres). The proposed expansion will be carried out within the existing premises itself. The details of land-use breakup of the existing plant and after the proposed expansion are given in **Table - 1.3**.

**TABLE - 1.3**  
**DETAILS OF LANDUSE BREAK-UP**

Sr. No	Landuse	Existing		After Expansion	
		ha	%	ha	%
1	Factory shed area	0.97	21.5	1.02	22.6
2	Scrap yard	0.66	14.6	0.68	15.1
3	Product storage area	0.32	7.1	0.32	7.1
4	Solid waste storage area	0.3	6.7	0.30	6.7
5	Greenbelt development	1.52	33.7	1.52	33.7
6	Road	0.60	13.3	0.60	13.3
7	Open space area	0.14	3.1	0.07	1.5
	<b>Total</b>	<b>4.51</b>	<b>100</b>	<b>4.51</b>	<b>100</b>

Source: ARS, Gummidipoondi

### 1.2.3 Raw Material Requirement

The major raw materials required for the proposed expansion project are Virgin Scrap, Sponge Iron and Ferro Alloys. The details of requirement of raw materials, sources and their mode of transportation are given in **Table-1.4**





**TABLE - 1.4  
DETAILS OF RAW MATERIAL REQUIREMENT FOR STEEL MELTING UNIT**

Sr. No	Raw material	Quantity (TPA)		Source of raw materials	Mode of transport
		Existing	After Expansion		
<b>Steel Melting Plant</b>					
1.	MS scrap	1,50,687.3	--	Singapore, USA, South Africa, Andhra Pradesh and Tamil Nadu	Shipping cum road
2.	Virgin scrap	--	2,82,412	Singapore, USA, South Africa, Andhra Pradesh and Tamil Nadu	Shipping cum road
3.	Sponge iron	8,072.7	15,102	Tamil Nadu, Andhra Pradesh and Karnataka	Closed Truck via road
4.	Ferro alloys	2,694	4,531	Tamil Nadu, Andhra Pradesh and Karnataka	Closed Truck via road
<b>Steel Rolling Mill</b>					
1.	MS Billets	2,69,000	2,69,000	In-plant production	Direct Hot Rolling Technology & Cranes

Source: ARS, Gummidipoondi

Note: 1,26,800 TPA of MS Billets was procured from Outside

After expansion 19,000 TPA of MS Billets will be Sold as separate.

#### 1.2.4 Power and Fuel Requirement

The power requirement for the existing plant is 14.5 MW, which is sourced from TANGEDCO. Subsequently, for the proposed expansion power requirement will be 26.5 MW, The 16.0 MW power sourced from TANGEDCO and remaining 10.5 MW will be met from M/s. ARS Energy Pvt. Ltd.(agreement dated 24.03.2017)

Particulars	Usage	Existing		After Expansion	
Power requirement <b>Source:</b> TANGEDCO ARS Energy Pvt Ltd	Induction furnace, CCM facility & Common amenities	14.5 MW		26.5 MW	
<b>Backup Facility</b>					
DG Set	Lightings, CCM	1 x 500 KVA	1 x 750 KVA	1 x 500 KVA	1 x 750 KVA
<b>Fuel</b>					
Low sulphur - High speed diesel Source: Local bunks	Diesel generator	160 Lit/hr	240 Lit/hr	160 Lit/hr	240 Lit/hr
Coal Source: Indonesia	Reheating Furnace	21,000 TPA		1050 TPA	
Source: ARS, Gummidipoondi Note: 95% of MS Billets will be directly charged into the rolling mill and 5 % of the billets will be reheated in the reheating furnace. Thus, Coal consumption will reduced up to 95% from the existing.					

#### 1.2.5 Water Requirement

The one time water requirement after the proposed expansion is 75.25 KLD and the daily fresh water requirement will be 40.75 KLD which will be sourced from SIPCOT Water supply. The details of existing water requirement and after expansion are presented in **Table - 1.5**.

**TABLE - 1.5  
DETAILS OF WATER REQUIREMENT**

Sr. No	Category	Quantity (KLD)	
		Existing	Upon expansion
1	Machinery cooling	35.16	52.58
2	Scrubber make up	0.34	0.42
3	Domestic requirement	20.00	22.25
<b>Total</b>		<b>55.5</b>	<b>75.25</b>

#### 1.2.6 Manpower Requirement

The manpower in the existing plant is 200 Nos. It will be increased up to 250 after the proposed expansion which includes manager, admin staffs, supervisor and workers.

#### 1.2.7 Process Description

The conversion of iron scrap in to billets does not require any sophisticated technology. Various grades of scrap such as super melting scrap, bazaar melting scrap, commercial scrap, sponge iron are melted in electrically operated induction furnace and will be poured into the billets using a Continuous Casting Machine (CCM). Then the hot billets are directly fed into the rolling mill by Hot rolling technology.

Direct Hot Rolling Technology is one of the advanced production management technologies in steel sector, which represents awareness of green and energy-saving ideology. Contrary to the conventional process of storage and cooling of the billet, the sensible heat from the continuous-cast billets is utilized by charging them directly into the rolling unit.

In Direct Hot Rolling, the melt, tapped at approximately 1660-1700°C, is transferred to the continuous casting machine quickly without any significant heat loss and is poured into mould at around 1590°C. The melt is solidified and cooled down to a temperature of 1050 to 1100°C by PLC controlled water cooling and secondary direct spray cooling. The solidifying billet is cut immediately and is passed to the rolling mill, ensuring a minimal heat loss.

The whole operation is conducted at a particular temperature range and within a limited time span. The stages of rolling operation are comprised of heating of feed stock to rollable temperature, rolling the feeding stock in different mill stands, cropping the hot bar during the process of roiling between mill stands as applicable and subsequently finishing in form of hot rolled deformed bar in straight length. The hot bar coming out of the last pass is then conveyed through a TMT line and collected in a cool bed after shearing. The bars at almost ambient temperature are sheared to commercial length, stored and kept ready for dispatch.

### 1.3 Baseline Environmental Status

The 10 km radial distance from the existing plant boundary has been considered as study area for Environmental Impact Assessment (EIA) baseline studies. Environmental monitoring for various attributes like meteorology, ambient air quality, surface and ground water quality, soil characteristics, noise levels and flora & fauna have been conducted at specified locations and the secondary data collected from various Government and Semi-Government organizations. Baseline Environmental monitoring studies for the various environmental attributes were carried out during 1<sup>st</sup> May 2018 to 31<sup>st</sup> July 2018. The details of the baseline study are presented as follows:

#### 1.3.1 Meteorology

Meteorological data at the site was monitored during 1<sup>st</sup> May 2018 to 31<sup>st</sup> July 2018. It was observed that during study period temperature ranged from 18°C to 36°C. During the same period of observations, the relative humidity recorded was ranged from 26% to 100%. Predominant wind directions are mostly from the North East (17.6%) followed by North (16.7%).

#### 1.3.2 Ambient Air Quality

To establish the baseline status of the ambient air quality in the study area, the air quality was monitored at eight (8) locations. The summary of the ambient air quality monitoring results is given in **Table - 1.6**.

**TABLE - 1.6  
SUMMARY OF AMBIENT AIR QUALITY IN THE STUDY AREA**

Sr.No	Parameters	Concentration (µg/m <sup>3</sup> )		NAAQS Limits, 2009 (µg/m <sup>3</sup> )
		Maximum	Minimum	
1	Particulate matter PM <sub>2.5</sub>	41.4	20.2	60
2	Particulate matter PM <sub>10</sub>	85.2	62.0	100
3	Sulphur dioxide (SO <sub>2</sub> )	13.9	7.0	80
4	Oxides of Nitrogen (NO <sub>x</sub> )	18.1	9.0	80
5	Carbon monoxide, CO	382	214	2000

#### 1.3.3 Water Quality

Eight (8) ground water samples and Eight (8) surface water samples within the study area were considered for assessment. The water samples are compared with the standards of drinking water IS 10500:2012.

##### **Ground water Quality**

The results of the ground water samples are compared with the standards for drinking water as per IS: 10500:2012. The samples were collected from the baseline locations except Arani river which was found to be dried during the study period. The analysis results indicate that the pH ranges in between 6.7 to 7.0, which is well within the specified standard of 6.5 to 8.5. The maximum pH of 7.0 was observed at Kayalarmedu (GW6) and the minimum pH of

6.7 was observed at Pudu Gummidipoondi (GW3) and Kammarpalayam (GW5). Total hardness was observed to be ranging from 227 to 364 mg/l. The maximum hardness was recorded at Plant site (GW1) and the minimum hardness was recorded at Kammarpalayam (GW5). The Total Dissolved Solids (TDS) concentrations were found to be ranging in between 728 to 895 mg/l. The maximum hardness was recorded at Palaya Gummidipoondi (GW4) and the minimum hardness was recorded at Pudu Gummidipoondi (GW3).

Chlorides at all the locations were within the permissible limit, ranging in between 149.7 to 288.3 mg/l. Fluorides are ranging in between 0.3 to 0.6 mg/l and are found to be within the permissible limit. Nitrates were found to be in the range of from 10.4 mg/l to 12.5 mg/l. The heavy metal content is below detectable limits.

### **Surface water Quality**

During the baseline period season, most of the surface water bodies in the study area were dry hence 6 samples were taken for analysis. The analysis results indicate that the pH ranges in between 7.3 to 7.9, which is well within the specified standard of 6.5 to 8.5. The maximum pH of 7.9 was observed at Edapalayam Lake (SW5) and the minimum pH of 7.3 was observed at Thamarai Eari (SW1).

Chlorides at all the locations were within the permissible limit, ranging in between 11.9 and 12736 mg/l. Fluorides are ranging in 0.1 to 1.1 mg/l and are found to be within the permissible limit. Nitrates were found to be in the range of from 0.7 mg/l to 19 mg/l. The heavy metal content is below detectable limits. The Total Dissolved Solids (TDS) concentrations were found to be ranging in between 354.2 to 35723 mg/l.

#### **1.3.4 Soil Characteristics**

Six (6) soil samples were collected in and around the plant site to assess the present soil quality of the region. It has been observed that the texture of the soil is mostly "clay soil" in the study area. The common color of the soil is pale brown. The pH of the soil ranged from 6.9 to 7.4, indicating that the soil is alkaline in nature. The bulk density of soil ranges from 1.3 to 1.5 gm/cc

#### **1.3.5 Noise Levels**

The noise monitoring has been conducted for determination of ambient noise levels at Eight (8) locations in the study area. The daytime ( $L_{day}$ ) noise levels were found to be in the range of 47.8 dB (A) to 63.2 dB (A). The night time ( $L_{night}$ ) noise levels were observed to be in the range of 43.2 dB(A) to 59.4 dB(A). Hence, the noise levels were found to be well within the range specified by CPCB norms.

#### **1.3.6 Ecological Environment**

On the basis of field studies, records of Botanical Survey of India and Forest department, Tamil Nadu state, the study area did not indicate the presence of any endangered and/or vulnerable species.

No species belongs to Sch-I, two Sch-II species present in the study area and rest of the species belongs to Sch-III, Sch-IV and Sch-V of Wildlife Protection Act, 1972.

### 1.3.7 Socio Environment

The study area (10-km radius) has a total population of 1,99,146 persons according to 2011 Census. The male and female constitute 50 % and 50 % of the total population respectively. As per census, the study area comprises 21.05% population belonging to Scheduled Castes (SC) and 2.27% belonging to Scheduled Tribes (ST).

The literacy rate is found to be 66.21%. As per census 2011 records, the main workers were found to be 32.77% of the total population. The marginal workers and non-workers constituted to 9.77% and 56.57% of the total population.

## 1.4 Anticipated Environmental Impacts and Mitigation Measures

### *Impacts during Operational Phase*

#### 1.4.1 Impact on Soil

The soil quality remains the same as the proposed expansion does not involve a change in land use pattern. The airborne fugitive dust from the plant is likely to be deposited on the topsoil in the immediate vicinity of the plant boundary. However, the fugitive emissions are likely to be controlled to a great extent through pollution control measures like water sprinkling and the greenbelt development.

#### 1.4.2 Impact on Air Quality

Particulate Matter (PM), Sulphur dioxide (SO<sub>2</sub>) and Oxides of Nitrogen (NO<sub>x</sub>) will be the major pollutants from the proposed expansion. In order to control the emissions of particulates, the pollution control equipments are proposed. Adequate stack height has been provided to disperse gaseous emissions over a wider area. The maximum resultant ground level concentration of PM, SO<sub>2</sub> and NO<sub>x</sub> are given in **Table - 1.7**

**TABLE - 1.7  
RESULTANT CONCENTRATIONS DUE TO INCREMENTAL GLCs**

Parameters	Concentration (µg/m <sup>3</sup> )			Distance and Direction	NAAQS Limits (2009) (µg/m <sup>3</sup> )
	Baseline	Incremental	Resultant		
PM	85.2	6.325	91.52	N,NE	100
SO <sub>2</sub>	13.9	8.642	22.54	N,NE	80
NO <sub>x</sub>	18.1	6.466	24.56	N,NE	80

#### Gaseous Emission Control Measures:

A 360° swing suction hood is provided just above crucible at required height to have effective suction of gases and fumes. Flue gases from the furnace will be passed through hood into the duct and through duct to spark arrestor. Wet scrubber has been proposed as the pollution control equipment to remove the gaseous emissions from the furnaces.

#### 1.4.3 Impact on Water Quality & Management

As the manufacturing process will be operated only on the dry process, water is mainly used at certain stages in the process like machinery cooling, scrubber make up and domestic needs. The entire water demand for the existing operation and proposed expansion will be met from existing bore well located within the industrial premises.

ARS has estimated that the one time water requirement for the proposed expansion will be 75.25 KLD. Out of which 40.75 KLD will be the daily fresh water requirement. The domestic sewage (20.25 KLD) generated from the proposed expansion will be treated in the proposed Sewage Treatment Plant having a capacity of 30 KLD. The treated wastewater of 20.25 KLD from the STP will be further treated and directed to the storage tank and it will be reused for greenbelt development. The scrubber effluent of 0.42 KLD will be treated in the existing solar evaporation pan. For cooling operations 52.58 KLD of water will be used and the blow down capacity 34.5 KLD from the process will be treated in the cooling tower. The treated water from the cooling process will be again recycled to the process. No wastewater will be discharged outside the plant premises. Hence, there is no impact on the water regime due to the wastewater generation from the plant operation.

#### 1.4.4 Impact due to Solid Waste Generation

In order to avoid problems associated with solid waste disposal, an effective solid waste management system will be followed. Hence, the impact due to solid waste generation during the plant operation is not envisaged. The sources, quantity of the solid waste generated and waste management measures for existing and after the proposed expansion are presented in **Table - 1.8**

**TABLE - 1.8  
DETAILS OF SOLID WASTE GENERATION AND MANAGEMENT**

Sr. No	Solid waste	HWM Categ.	Quantity (TPA)	Treatment or Disposal
<b>I</b>	<b>Existing</b>			
<b>1</b>	<b>Furnace division – Non hazardous</b>			
A	Furnace slag	-	2,251.5	Given to contractors
B	Runner & riser	-	1,378.5	Re-melted in induction furnace
C	Domestic waste	-	3.60	Will be collected by civic bodies
<b>2</b>	<b>Furnace division – Hazardous</b>			
D	Solar evaporation residue	37.3	0.24	Collected and transported to CTSDf, Gummidipoondi
E	Spent oil	5.1	0.38	Re-used in parts of cooling bed
<b>3</b>	<b>Billet division– Non – hazardous</b>			
A	Furnace slag	-	6,864.0	Given to contractors
B	Returnables	-	8,119.68	Re-melted in induction furnace
C	CCM Scale	-	582.12	Given to contractors
D	STP Sludge	-	3.67	Treated, dried and used as manure
E	Domestic waste	-	18.0	Will be collected by civic bodies
<b>4</b>	<b>Billet division– Hazardous</b>			
F	Solar evaporation residue	37.3	0.58	Collected and transported to CTSDf, Gummidipoondi



G	Spent oil	5.1	0.38	Re-used in parts of cooling bed
<b>5</b>	<b>Rolling Mill division – Non hazardous</b>			
I	End Cuttings	-	7500	Re-melted in steel melting furnace
J	Mill scale	-	5100	Re-melted in steel melting furnace
K	Misrolls	-	6400	Re-melted in steel melting furnace
L	Ash	-	1470	Given to fly ash brick manufactures
<b>II</b>	<b>After Expansion</b>			
<b>1</b>	<b>Billet division – Non –hazardous</b>			
A	Furnace slag	-	6,041.0	Given to contractors
B	Returnables	-	6,313.0	Re-melted in induction furnace
C	CCM Scale	-	1,510.0	Given to contractors
D	STP Sludge	-	4.41	Treated, dried and used as manure
E	Domestic waste		21.60	Will be collected by civic bodies
<b>2</b>	<b>Billet division– Hazardous</b>			
F	Solar Pan residue	37.3	1.8	Collected and transported to CTSDf, Gummidipoondi
G	Oil bearing cotton waste	33.2	0.3	
H	Spent oil	5.1	0.96	Re-used as Lubricants
<b>3</b>	<b>Rolling Mill division – Non hazardous</b>			
I	End Cuttings	-	7,500	Re-melted in steel melting furnace
J	Mill scale	-	5,100	Re-melted in steel melting furnace
K	Misrolls	-	6,400	Re-melted in steel melting furnace
L	Ash	-	73.5	Given to fly ash brick manufactures

#### 1.4.5 Impact on Noise levels

The major noise generating sources are from cooling tower, air compressors, transformer, TMT cutting machines, DG sets, loading & unloading operation. The predicted noise level through mathematic modeling at the boundary due to various plant activities will be ranging in between 48-50 dB (A). It is seen from the modelling results that the incremental noise levels are within the CPCB standards.

#### Noise Attenuation Measures

The following control measures will be implemented for the proposed expansion project:

- All the design/installation precautions as specified by the manufacturers with respect to noise control will be strictly adhered to;
- High noise generating sources will be insulated adequately by providing suitable enclosures;
- All the necessary noise protective equipment will be supplied to workmen operating near high noise generating sources.
- The air compressor, DG sets, transformer will be provided with acoustic enclosure;
- Other than the regular maintenance of the various equipment, ear plugs/muffs will be recommended for the personnel working close to the noise generating units; and
- Adequate greenbelt development is also being developed in the plant boundary of the steel plant.

#### 1.4.6 Impact on Ecology

The incremental concentrations of the air quality modelling shows that the resultant levels of PM, SO<sub>2</sub> and NO<sub>x</sub> are well within the permissible limits as per National Ambient Air Quality Standards, 2009. The impacts on aquatic ecology due to the proposed expansion activity would be negligible as the treated water will be properly reused and no waste water is discharged outside the plant premises. The proposed expansion does not create any significant impact on aquatic bodies.

#### 1.4.7 Impact on Public Health

The discharge of waste materials (stack emission, wastewater and solid wastes) from process operations can have some adverse impact on public safety and health in the surrounding area, if appropriate treatment procedures are not followed. As the plant pollution control equipments will be designed as per the modern available technology for controlling the impacts, no adverse impacts on public health in the area are anticipated.

### **1.5 Environmental Management Plan**

#### ***Environmental Management Plan during the Erection Phase***

##### 1.5.1 Soil Environment Management

Preparation of site will involve excavations and fillings. The earthen material generated during excavations and site grading periods, shall be properly dumped and slope stabilisation shall be taken. The topsoil generated during erections shall be preserved and reused for plantations.

The additional greenbelt area shall be delineated before start-up of earthwork and tree plantation shall be taken up during erection stage itself.

##### 1.5.2 Air Quality Management

The activities like site development, grading and vehicular traffic contribute to increase in PM and NO<sub>x</sub> concentrations. The mitigation measures recommended to minimize the impacts are:

- Water Sprinkling in construction area;
- Asphaltting the main approach road;
- Proper maintenance of vehicles and construction equipment; and
- Tree plantation in the area earmarked for greenbelt development.

##### 1.5.3 Water Quality Management

- The earthwork (cutting and filling) will be avoided during the rainy season and will be completed during the summer season.
- Stone pitching on the slopes and construction of concrete drains for storm water to minimize soil erosion in the area will be undertaken.
- Soil binding and fast growing vegetation will be grown within the plant premises to arrest the soil erosion.



#### 1.5.4 Noise Level Management

Operation of construction equipment and vehicular traffic contribute to the increased noise level. Recommended mitigation measures are:

- Enclosures for noise making units like pumps, compressors etc.,
- Good maintenance of vehicles and construction equipment;
- Plantation of trees around the plant boundary to attenuate the noise; and
- Provision of earplugs and earmuffs to workers.

#### 1.5.5 Ecological Management

Clearing of vegetation will not be required as the land is already under possession of the project proponent. Thus, there will not be any ecological impact due to the project expansion in its erection stage.

#### ***Environment Management Plan during the Operation Phase***

During operation phase, the impacts on the various environmental attributes should be mitigated using appropriate pollution control equipment. The Environment Management Plan prepared for the proposed expansion project aims at minimizing the pollution at the source itself.

#### 1.5.6 Air pollution Management

Fugitive and Stack emission from the steel melting plant will contribute to increase in concentrations of PM, SO<sub>2</sub> and NO<sub>x</sub>. The mitigation measures recommended are as follows:

- Raw material handling sections are major source for fugitive emissions;
- Adopting good housekeeping practice will also help in control of fugitive emission. Maintaining shop floor and roads in good condition minimizes the chances of fugitive emission; and
- The trucks and other vehicles shall be maintained and serviced regularly to reduce air emissions.

#### 1.5.7 Water pollution management

The recommended measures to minimise the impacts are as follows;

- Recycling of wastewater for ash disposal, coal handling areas;
- Adequate treatment of wastewater prior to recycling/reuse to maximum extent;
- Utilization of treated domestic wastewater in greenbelt development and plant operation;
- Lining of effluent dyke suitably to prevent any seepage into ground to avoid any groundwater contamination;
- Provision of storm water system to collect and store run-off water during rainy season and utilization of the same in the process to reduce the fresh water requirement; and
- Suitable rainwater harvesting structures to be constructed.

#### 1.5.8 Noise pollution Management

The major noise generating sources are the cooling tower, air compressors, transformer, TMT cutting machines, DG sets, loading & unloading operation. Some recommendations are;

- Adequate protective measures in the form of ear muffs/ear plugs have been provided to the workers working in high noise areas;
- In addition, reduction in noise levels in the high noise machinery areas could be achieved by adoption of suitable preventive measures such as suitable building layout in which the equipment are to be located; and
- Adequate greenbelt development is also being developed in the plant boundary.

#### 1.5.9 Solid Waste Management

The quantities of the solid waste generation before and after the proposed expansion are listed below:

- The furnace slag is generated during the induction melting process from the crucible. The quantity of furnace slag generation will be 6,041 TPA after the proposed expansion. The furnace slag generated will be collected and stored in solid waste storage area and will be given to the contractors;
- The returnable scraps generated during the various plant operations will be 6,313 TPA after the proposed expansion. The rejected waste generated will be collected, stored and re-melted in the induction melting process;
- The wet scrubber effluent generated from the melting operation consists of scrubber bleed which will be collected in the solar Evaporation Pan and the residues of 1.8 TPA will be get settled down. The settled pan residues are collected and given to TSDF, Gummidipoondi for disposal;
- The STP sludge of 4.41 TPA will be generated from the sewage treatment plant operation. The sludge will be collected, dried and used as manure for green belt development; and
- The CCM scale generation after the proposed expansion will be 1,510 TPA.
- Solid waste from rolling mill are End Cuttings (7,500 TPA), Mill scale (5,100 TPA) and Misrolls (6400 TPA) will re-melted in process

### 1.6 **Traffic Study**

The project site is located at a distance of 0.7 km from NH-5 which is Guntur-Chennai road. The engine driven vehicles were classified into various levels like two wheelers, Auto Rickshaw, Car/Utility, Buses and Trucks. The proposed expansion involves the transport of raw material and finished goods near to and from the plant site. The present level of traffic on the existing NH-5 (Guntur- Chennai) is found to be 655 PCUs/hr. The total traffic generated from the proposed expansion is 665 PCUs/hr (655+10=665).The transportation in the proposed expansion not create any significant impacts to the environment. The traffic scenario is presented in **Table-1.9**.

**TABLE-1.9  
TRAFFIC SCENARIO**

Road	V	C*	V/C Ratio	LOS
Chennai – Guntur Hwy (NH-5)	<b>Existing</b>			
	655	4000	0.16	A
	<b>After Expansion</b>			
	665 (655+10)	4000	0.17	A

V= Volume in PCUs/hr & C= Capacity in PCUs/ hr

\* Note: Capacity as per IRC Guidelines

The existing level of service (LOS) of the Chennai – Guntur Hwy (NH-5) is 'A' which is excellent. After considering the transportation of trucks due to the proposed project expansion, meagre impact was envisaged. The level of service predicted to be 'A' (**Excellent**) even after the proposed expansion.

There will be a frequent movement of trucks in the plant premise for the transportation of raw material and products but the proposed expansion involves only a small increase in truck numbers which may never cause a significant impact. The vehicular movements can discharge SO<sub>2</sub>, NO<sub>x</sub> and particulate emissions due to combustion engines. The emission from the vehicular movements can be controlled by good management practices of the vehicles.


- Vehicles used for transportation will be equipped with novel engine for reducing emissions.
- Low sulphur-High Speed Diesel will be used for fuelling vehicles.
- Periodical maintenance of vehicles with emission testing will be carried out.

## 1.7 Environmental Monitoring Program

The environmental monitoring program is important in terms of evaluating the performance of pollution control equipment installed in the plant. The sampling and analysis of the environmental attributes will be as per the guidelines of CPCB/TNCPB. The frequency of air, noise, surface water and ground water sampling and location of sampling will be as per the directives of Tamil Nadu Pollution Control Board.

### 1.7.1 Budgetary Allocation for Environmental Protection

The total cost for the proposed expansion project is about Rs.5.9 Crores. It is proposed to invest about Rs.59 Lakhs, i.e. 10% of the total cost on pollution control & treatment, green belt development, rainwater harvesting, environmental monitoring systems and others. The break-up of the investment is given in **Table - 1.10**

	<b>Environmental Impact Assessment for the Proposed Expansion of Steel Melting Plant from 1,42,200 TPA (MS Ingots of 41,400 TPA, MS Billets of 1,00,800 TPA) to 2,88,000.0 TPA of MS Billets and 2,50,000 TPA of TMT Bars at Pappankuppam Village, SIPCOT Industrial Complex, Gummidipoondi Taluk, Tiruvallur District, Tamil Nadu</b>
	<b>Executive Summary</b>

**TABLE - 1.10**  
**COST PROVISION FOR ENVIRONMENTAL MEASURES**

Sr.No.	Description of Item	Capital Cost (Rs. In Lakhs)	Recurring Cost (Rs.in Lakhs/Annum)
1	Air pollution control system	38	6.0
2	Water pollution control system	14.0	2.0
3	Environmental Monitoring	--	3.0
4	Rainwater harvesting and others	2.0	0.5
5	Greenbelt development	5.0	1.0
<b>Total</b>		<b>59.0</b>	<b>12.5</b>

Source: ARS, Gummidipoondi.

#### 1.7.2 Greenbelt Development

Greenbelt will be developed along with the existing greenbelt area. Greenbelt/landscaping are already being maintained at 33.7% which covers a land area of 1.52 ha for the existing plant. Additionally plantation developed within existing greenbelt area.

#### 1.8 **Disaster Management Plan**

To tackle the consequences of a major emergency inside the plant premises or its immediate vicinity, a Disaster Management Plan has been formulated. The objective of the Disaster Management Plan is to make use of the combined resources of the steel melting plant and the outside services, to achieve the following:

- Effect the rescue and medical treatment of casualties;
- Safeguard other people;
- Minimize damage to property and the environment;
- Initially contain and ultimately bring the incident under control;
- Identify any dead;
- Provide for the needs of relatives;
- Provide authoritative information to the media;
- Secure the safe rehabilitation of affected area; and
- Preserve relevant records and equipment for the subsequent inquiry into the cause and circumstances of the Emergency.

##### 1.8.1 Occupational Health & Safety Measures

Large projects where multifarious activities are involved during construction, erection, testing, commissioning, operation and maintenance, the men, materials and machines are the basic inputs. Along with the benefits, the industrialization generally brings several problems like occupational health and safety.

The industrial planner therefore has to take steps to minimize the impacts and to ensure appropriate occupational health and safety in the steel melting plant. The following measures are proposed:



- Conducting awareness programs at regular intervals to the employees;
- Providing safety kits and prevention kits; and
- Provision of Clinic at the plant site to handle emergency situations that may arise.

### 1.9 Corporate Social Responsibility

M/s. ARS proposes to take part in various CSR activities like water supply, library facility to nearby Govt school, improvement of nearby pond. The CSR activity plan for the proposed expansion plant is shown in **Table - 1.11(a)** and **Table - 1.11(b)**.

**TABLE - 1.11(a)**  
**EXISTING CORPORATE SOCIAL RESPONSIBILITY**

Sr. No.	CSR Activity	Cost (Rs. In Lakhs)
1	Fund allocated for Solid waste Management project to district administration	5.0
2	Provision of Educational kits to nearby government school	0.5
<b>Total</b>		<b>5.5</b>

Source: ARS, Gummidipoondi.

**TABLE - 1.11(b)**  
**CORPORATE SOCIAL RESPONSIBILITY ACTION PLAN**

Sr. No.	CSR Activity	Capital Cost (Rs. In Lakhs)	Recurring Cost Per Annum (Rs. In Lakhs)
<b>Environment</b>			
1	Improvement of Thamarai Eari	2.6	0.8
<b>Health Care</b>			
1	Providing potable water supply and sanitation for nearby Govt. School	5.6	1.4
<b>Rural Development</b>			
1	Improvement of Infrastructure facility in nearby village	5.0	1.0
2	Provision of Educational kits and accessories to the nearby Govt. school	1.55	0.5
<b>Total</b>		<b>14.75</b>	<b>3.70</b>

Source: ARS, Gummidipoondi.

### 1.10 Project Benefits

The basic requirement of the community needs will be strengthened by extending health care, educational facilities to the community, providing drinking water to the villages, building/strengthening of existing roads in the area.

Implementation of the power project will result in the following benefits



- Temporary employment for people from the neighboring villages during construction phase;
- Community development activities such as training of local unemployed youth in various construction skills, English speaking, personality development, development of self-help groups for women, providing drinking water facility, strengthening of rural roads, deepening of ponds etc.,
- State will get revenue from payment towards taxes and water cess etc.,
- Providing dispensary with a medicine bank to cater to the health care needs of the surrounding villages;
- Providing vocational training to women in areas for their self-employment.
- Utilizing the services of ex-servicemen for providing training to youth in areas of personality development, security etc.,

### **1.11 Conclusion**

The proposed Expansion of steel melting plant has certain level of marginal impacts on the local environment. Thus, it can be concluded that with the judicious and proper implementation of the pollution control and mitigation measures, the proposed expansion project would be beneficial to the society as well as to reduce the demand-supply gap of billets and steel products which contributes to the economic development of the region in particular and country in general.