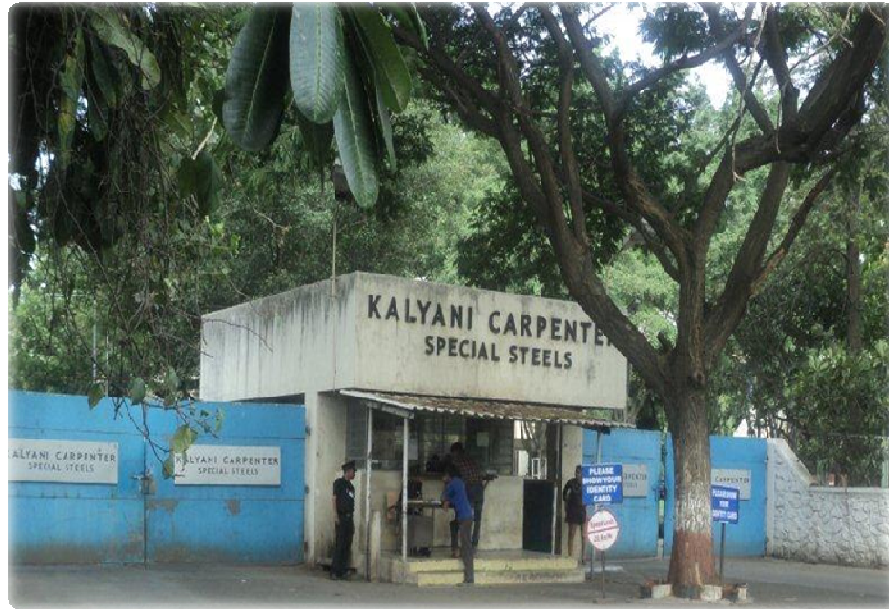


# Executive Summary

*Of*

## **Augmentation of Production from 1,50,000 to 2,04,000 MTA**

[Augmentation of Production through debottlenecking, process improvement & cycle time reduction without installation of new furnace]



Proponent

## **KALYANI CARPENTER SPECIAL STEELS LTD.**

At 72-76, Mundhwa Industrial Area, Pune, Maharashtra

**EIA Consultant**

**Shreeji Aqua Treatment Pvt. Ltd.**

*And*

**Green Circle INC.**

**July 2014**

## Introduction:

**Kalyani Carpenter Special Steel Ltd (KCSSL)**, have proposed to utilize its existing capacity to increase production at Pune Cantonment, Survey no. 72-76, Mundhwa, Pune, Maharashtra 411036.

KCSSL is a joint venture company between Kalyani group and Carpenter technologies Corporation USA since 1999. The company is promoted by Shri Babasaheb Kalyani.

KCSSL produces alloy and special steels for auto industries, engineering industries, nuclear and power generation industries. It is well known for its quality of special steels. The production facility of KCSSL is spread over an area of 1,01,208 m<sup>2</sup>. The build-up area is 47,526 m<sup>2</sup>. The green belt area is 18,000 m<sup>2</sup>. Proposed Augmentation will be done on the existing premises of factory.

KCSSL is presently operating at 1,50,000 MTA of alloy and special steels; & now augmenting the production by 54,000 MTA by reducing the cycle time and increasing the productivity across the operations, by adopting the latest technology.

KCSSL is EAF based plant for primary melting followed by ladle furnace and vacuum degassing facility for secondary metallurgy. Casting facility includes ingots and continuous cast blooms, blooming mills followed by 600 dia 3-hi two stands for hot rolling. KCSSL will reduce the cycle time by adopting use of chemical energy technology in EAF and improving the quality of metallic inputs. The company improved the environment around the furnace and surroundings by installing the state of the art pollution control system provided by Badish Stahl- Engineering, Germany. KCSSL also upgraded the rolling operations by installing oxygen assisted heating system in walking beam furnace to reduce the fuel consumption and mechanized the rolling operations by installing the fast acting grip tilters at 22" Mill stand.

There is no increase in the pollution load after the proposed Augmentation and is within the existing site with adoption of adequate pollution control measures.

The plant is located in industrial zone notified by Pune Cantonment Board. KCSSL have also got a Pollution load study conducted by institute of Chemical Technology – Matunga, who have certified the proposed Augmentation on the basis of “No increase in pollution load.”

The proposed project fall under 3a (B2) category of the Environmental Impact Assessment Notification and requires an Environmental Clearance from the Government of Maharashtra.

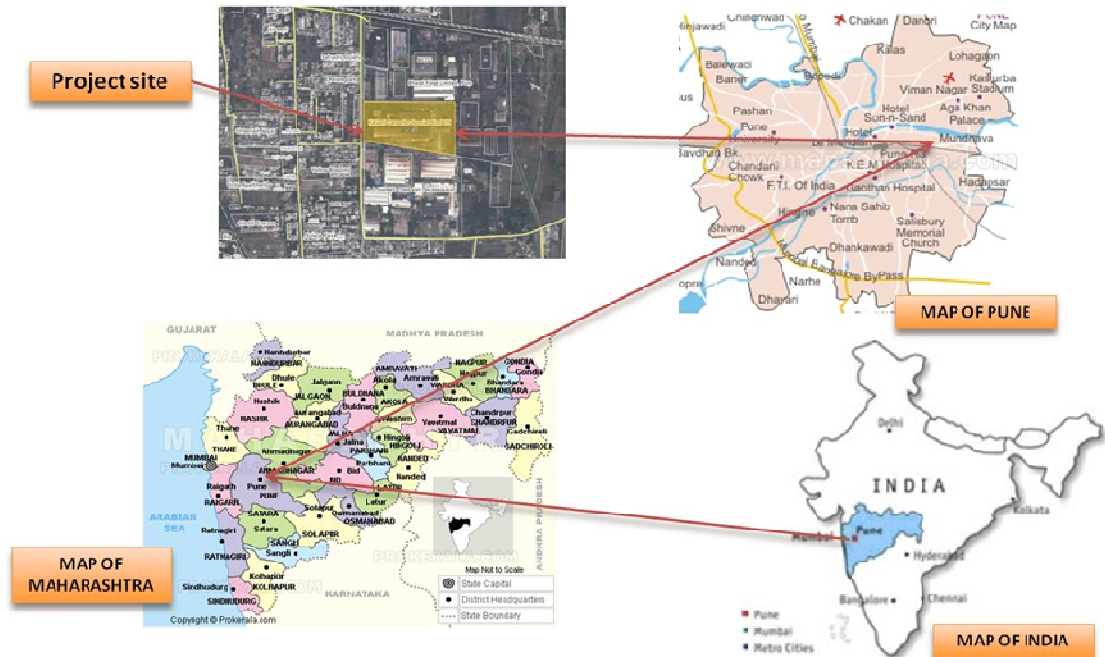
The purpose of this Environmental Impact Assessment (EIA) study is to provide information on the surroundings and the extent of environmental impacts likely to arise on account of the Augmentation of existing activity, and also to define an Environmental Management Plan (EMP) to minimise and mitigate the likely adverse environmental impacts. The details of project site are as shown in **Table 1** below;

**Table 1: Project Details**

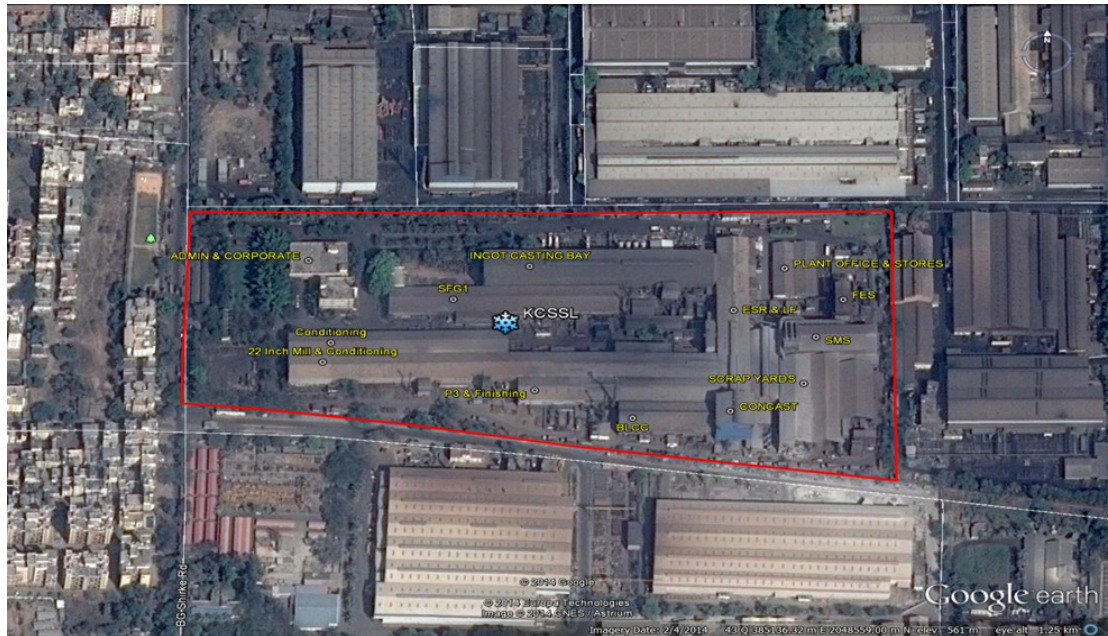
Sr.	Particulars	Details
1.	Location	Survey no. 72-76, Mundhawa, Pune
2.	Nearest railway station	Pune railway station: <b>5 km</b>
3.	Nearest airport	Pune International airport: <b>11 km</b>
4.	Nearest port / jetty	JNPT, Nhavaseva port: <b>149 km</b>
5.	Access road (National / State highway)	NH4: 5 km
6.	Latitude Longitude	<b>18°31'57.88" N</b> <b>73°56'31.28" E</b>

The location map indicating the project site is depicted in **Figure 1 & 2**.

**Figure 1: Location of Project site**



**Figure 2: Google Earth Image of Project Site**



**Project Description:**

The plant is presently operating at 150000 MTA finished steel level. The project is augmenting this by following action;

- I. Debottlenecking of the old production lines.
- II. Adopting the latest state of art technologies.
- III. Reducing the cycle time wherever possible.
- IV. Mechanizing the operations wherever possible.
- V. Adopting the latest technologies for Pollution Control Systems at the melting furnaces.

No new equipments are added.

**Product:**

The existing and proposed production details of the project are given in **Table No. 2**

**Table 2: Products and production details**

<b>Name of product (Various Sizes &amp; Grades)</b>	<b>Existing MTA</b>	<b>Proposed Augmentation MTA</b>	<b>Total MTA</b>
Ingots, Rolled Products	1,50,000	54,000	2,04,000

**Raw materials:**

The steel manufacturing industry required variety of raw material which presently is being supplied from local/foreign market/both. The existing unit is using the MS Scrap, alloying metals for the special steels. Following **Table 3** shows Raw materials requirement.

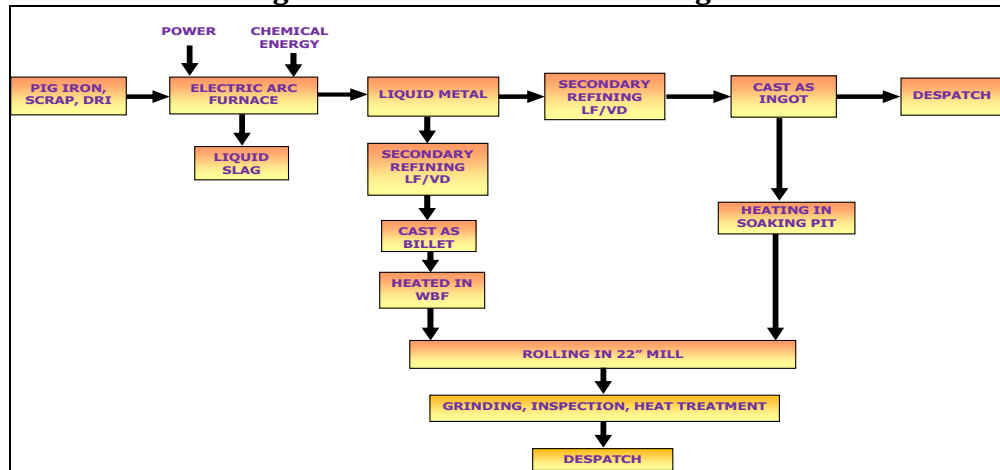
**Table 3: Raw material requirement**

Sr.	Raw material	Quantity MTA		Total Quantity
		Existing	Additional	
1.	Steel Scrap	1,84,223	66,320	2,50,543
2.	Dolomite	8,149	2,934	11,082
3.	Lime	5,563	2,003	7,565
4.	Ferromanganese	1793	645	2,438
5.	Ferrosilicon lump	1,257	453	1,710
6.	Coke	1,148	413	1,562
7.	Albars/Lumps/ Shots	736	265	1,001
8.	Graphite Electrode	690	248	938
9.	Silicomanganese	644	232	876

**Process Description:**

The detailed stage wise manufacturing processes of existing set-up as well as proposed Augmentation project are delineated below; **Figure 3** shows process flow block diagram.

**Figure 3: Process Flow Block Diagram**



**Melting:**

- The pre-degree metallic inputs consisting of Pig Iron, Direct Reduced Iron (DRI) and Heavy Melting Scrap in defined ratios are charged into the Electric Arc Furnace [EAF]. The EAF is powered by 20 / 22 MVA Transformer; the electrical power from transformer is passed through the Graphite Electrodes which strikes the arc between the electrode and scrap in the furnace.
- The melting operation takes place due to this in the furnace. This operation is further assisted by injecting Oxygen and Oil through Virtual Lance Burners fixed on the Furnace. This total operation is completed in about 70 to 72 minutes. The melter metal is then tapped into the ladle by tilting the furnace. Ferro alloys are added into the Ladle while tapping is taking place. The molten metal in ladle is then transferred to Ladle Furnace and Vacuum Degassing Station [LF/VD].
- In the Ladle Furnace the metal is refined by adding ferro alloys as per the requirement while metal is being heated. After attaining required Chemistry and temperature of the metal, the ladle is transferred to Degassing Station. In the



degassing station the metal is treated under vacuum to remove the dissolved gases. After this treatment the metal is ready for casting.

**Casting:**

- The treated metal from Ladle Furnace is then transferred by the help of crane either to Ingot Casting Bay or Continuous Casting Machine.
- In the Ingot Casting Bay the hot metal from Ladle is poured into casting moulds and then allowed to solidify. After complete solidification process is completed, the ingots stripped and transferred / despatched in ingot form.
- In case of bloom caster, the ladle containing hot metal is transferred to the casting platform by crane. The metal is then tapped into tundish of the caster.
- The metal from tundish flows into the mould assemblies which is water cooled. The solidified bloom is withdrawn continuously from the mould by the dummy bar driven by the straightener rolls. The continuously cast bloom is straightened in the straightener and then cut into the required lengths by the help of cutting torch. The cut blooms are then transferred to cooling bed for cooling to ambient temperature.

**Rolling:**

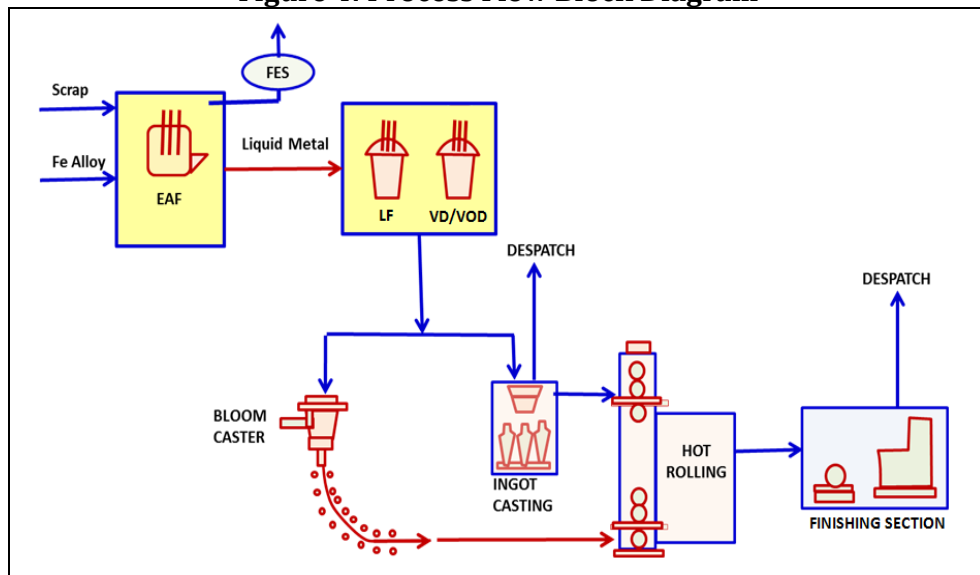
The blooms from the bloom caster are then transferred to the Rolling Mill Shop for rolling. The blooms are charged into the Walking Beam Furnace for re-heating of the blooms to 1250°C for rolling operation. This furnace is oil fired one now. The re-heated blooms are then discharged one by one on to the Conveyor Roller Table. Each bloom is then rolled into different sizes either in round shape or round corner squares in the rolling mills. The bars are cut by the hot saw in mill and transferred to cooling bed for cooling it down to ambient temperature.

**Finishing section:**

The cooled bars from the cooling bed of rolling mill are transferred to finishing section. In this section depending on the requirement the surface inspection is carried out for any defects which are corrected and the necessary tests required are attended. After this bars are bundled and are ready for despatch.

Process flow is given as shown in following **figures 4**

**Figure 4: Process Flow Block Diagram**



**Baseline Environmental Quality:**

Keeping in view the nature of activities involved in the production of Steel and various environmental guidelines, the area covering a radial distance of about 10 km from the site of the plant was selected as a study area for the purpose of formulating EIA.

To establish the baseline status of air, water, noise, land, biological and socio-economic environment in the study area, extensive field studies have been undertaken during the summer season covering a period of 3 months from March 2014 to May 2014.

**Climate:**

The project area has a hot semi-arid coastal climate. The month of April is the hottest month of the year with mean monthly maximum temperature being 34°C. The city often receives heavy thundershowers in May (and humidity remains high). Even during the hottest months, the nights are usually cool due to high altitude. The month of December, is the coolest month of the year with a monthly minimum temperature of 10°C. The average annual rainfall in the Pune district is 722 mm. The air is humid throughout the year.

**Air Quality:**

Air quality was monitored at ten numbers of air-quality stations and it was observed that the levels of PM2.5, PM10, SO<sub>2</sub> and NO<sub>x</sub> are well within the standards prescribed by CPCB.

**Noise Quality:**

Noise levels were monitored at ten locations within the study area. Day time and night time noise level on project site ranges from 49.65 to 52.00 dB (A) and 38.88 to 42.49 dB (A) respectively. Noise levels during day time and night time at all locations are within the permissible limits of CPCB prescribed for Residential area.

**Water Quality:**

Water samples of both Ground water (3 Locations) and Surface water (1 Location) sources, were analyzed and compared with IS: 10500 Standards. The water from surface water sources is found to be fit for drinking purposes after conventional treatment.

**Soil Quality:**

The district possesses mainly three varieties of soil i.e. black, red and yellow. At certain places these soils blend with one another. Bright yellow soil is found in the project area Soil qualities were assessed at 6 locations. The soil from the study area shows low to moderate fertility.

**Biological Environment:**

No wild life of any sort is found within the Study. The fauna found in the area are of common variety and no endangered or threatened species are reported in the study area.

The common tree species observed in the project area are given below in **Table No. 4**

**Table 4: List of trees**

<b>Name of species (Common Name)</b>	<b>Scientific Name (Botanical name)</b>
Waval	Holopteleaintegrifolia
Chafa	Plumeria
Peepal	Ficusreligiosa
PandhariSawar	Ceibapentandra

Anjan	Hardwikiabinata
Boabab	Adansoniadigitata
Black Pearl	Harpulliazanguebarica
Ylang-Ylang	Canangaodorata
Beeja	Pterocarpusmarsupium

**Socio Economic Environment:**

According to the 2011 census Pune District has a population of 9,429,408. The district has a population density of 603 inhabitants per square kilometre (1,560/sq mi). Its population growth rate over the decade 2001-2011 was 30.34%. As of the census of 2001, there were 7,232,555 people and 1,517,041 households. The population density was 462 people per /km<sup>2</sup>.

In the district the population was spread out with 6,85,022 under the age of 4; 1,491,352 from 5 to 15; 4,466,901 from 15 to 59 and 5,89,280 60 years of age or older. For every 1000 males age 6 and older, there were 919 females.

**Land use:**

There will be no significant change in the soil characteristics and landscape due to proposed augmentation of the **KCSSL** plant.

The emissions released into the atmosphere results from sources like heavy equipments, storage facilities, pump valves, vents and leaking seals. The HC toxicity to vegetation can occur at a level as low as 1ppm to sensitive plants such as orchids, caran thus, roses and camellia. The control measures available at present and additional air pollution control equipments/ measures for proposed augmentation will control the adverse effects.

**Impact Assessment:**

**Air Environment:**

Compliance with existing ambient air quality standards would be maintained by efficient operation of the **KCSSL** Plant and implementation of EMP. The green belt developed around the industry will arrest the dispersion of any fugitive emissions evolved periodically/ occasionally from unidentified sources in the **KCSSL** Plant area.

The impact of air pollutants generated due to existing and proposed set-up of **KCSSL** will be insignificant on the human settlements in the area under study.

**Water Environment:**

After implementation of proposed augmentation project, water requirement will increase by another 100 m<sup>3</sup>/day for industrial purposes.

In the existing set-up, domestic effluent generation is 80 m<sup>3</sup>/day. Domestic effluent from the various buildings/sheds of the plant is conveyed through separate drains to sewage treatment plant. Existing arrangements are adequate to abate the pollution due to domestic effluent.

**Noise Environment:**

The major noise sources identified in the steel plant are Electric Arc Furnaces (SMS), Reheating Furnaces, and D. G. Set etc.

For these sources the workers can be protected using earplugs and arranging their duties in cycles. The impact of noise generated due to proposed augmentation is insignificant on the human settlements in the area.



**Biological Environment:**

As the study area does not have any sensitive plants in surroundings, the impact of proposed project on such vegetation is insignificant.

**Impact statement:**

With the green belt development around the plant already developed and as suggested in EMP the terrestrial environment of the region will be having positive improvement and will further mitigate fugitive emissions as well as attenuated noise impact. The impacts on terrestrial and aquatic ecology due to the proposed augmentation of unit will be insignificant.

**Ecology:**

The study area does not provide habitation to any rare and endangered species of flora and fauna.

**Socio-Economics:**

Enhancement in production will provide impetus to overall economic activity in the area and hence will have positive impact on socio-economic conditions.

**Impact statement: Socio-Economics:**

The impact of the project on socio-economic status of the region would be predominantly positive, if proper implementations of the measures suggested in the EMP are made.

**Overall Impact:**

The overall impact of the augmentation of steel manufacturing plant is beneficial as the impact on the air, noise, water, land and biological environments are not very significant and the socio-economic benefits are predominantly positive. **Table 5** shows the detailed Environmental monitoring program.

**Table 5: Environmental monitoring program**

Sr.	Environmental attribute	Locations	Parameters	Period and Frequency
1.	Ambient Air Quality	<ul style="list-style-type: none"> <li>• One at centre</li> <li>• One Upwind &amp;</li> <li>• Two downwind Location</li> </ul>	Criteria Pollutants: SO <sub>2</sub> , NO <sub>x</sub> , PM10, PM2.5	24-hr average sampling on Monthly basis
2.	Stack emission monitoring	All stacks of Existing Plant and One Stack in Proposed Augumentation	SO <sub>2</sub> , NO <sub>x</sub> , PM10, PM2.5, CO	Monthly for all Stacks
3.	Ambient Noise	Inplant Noise levels and Noise level within 1km from plant	dB(A) levels <ul style="list-style-type: none"> <li>• SPL (dBA)</li> <li>• Leq (Night &amp; Day)</li> </ul>	Leq (day) and Leq (Night) will be monitored once in month.
4.	Treated Effluent quality	Sewage Treatment Plant	Parameters for horticulture use - BOD, pH, S.S, pathogens	Once in Every month during functional Phase

Sr.	Environmental attribute	Locations	Parameters	Period and Frequency
5.	Soil quality	Green belt area	Organic matter, C, H, N, Alkalinity, Acidity, heavy metals and trace metal.	Pre-monsoon and post-monsoon during functional phase.
6.	Ground water quality	Three locations	Drinking water parameters as per IS 10500	Once in Three months
7.	Surface water quality	One location	Drinking water parameters as per IS 10500	Once in Three months
8.	Occupational exposure monitoring	main plant area	Audiometer test	Once a Year
9.	Meteorology	Plant site at suitable location	Wind speed, direction, relative humidity, temp etc.	Continuous on hourly basis

**Risk assessment & disaster management plan:**

The risk assessment helps one in taking care of probable hazards on account of faulty / defective operations of various plants, machinery, equipment, etc. Such risk assessment proves helpful in foreseeing the risks involved in various operations to prevent the likely accidents.

The product manufacturing at KCSSL is a simple few step process. However Risk can be posed by storage of Furnace Oil.

All necessary mitigation measures will be taken to reduce the risk associated with storage of Furnace Oil.

**Disaster management plan:**

Disaster is an undesirable occurrence of events of such magnitude and nature, which adversely affects production and/or causes damage to environment. Risk assessment forms an integral part of disaster management and any realistic 'Disaster Management Plan' could only occur through a scientific risk assessment studies and involves;

- Requirement of fire extinguisher at all the fire prone sides.
- Mock drill will be carried out periodically for emergency preparedness.
- Effective communication systems at all the parts of the plant will be maintained.

In KCSSL On Site Disaster Management Plan has been in Place. Regular Mock drill has been carried out to assess the efficiency of On site DMP Plan.

**Environmental management plan:**

EMP would help to mitigate adverse impacts likely to arise out of the proposed augmentation project as well as smooth functioning of the steel plant.

**Air Environment:**

Advanced pollution control systems are provided to control pollution in the KCSSL, Pune. The company has installed comprehensive pollution control system and all pollution control measures have been implemented in the factory. The major air pollution control equipments functioning in the plant are in line with production activities. The equipments are as follows:

- Dust/ Fume Extraction System
- Bag Filter

**Existing & proposed air pollution control equipments:**

For the proposed augmentation of steel plant adequate number of pollution control equipments will be provided to mitigate the impact on air arising due to the augmentation.

Following measures will be carried out for preservation of environment.

- Monthly stack monitoring and work monitoring will be carried out regularly as per MPCB guidelines.
- For effective environmental management and to comply with MPCB standards for emission of air pollutants following units are installed at KCSSL Ltd.
- Breakdowns in the pollution control systems will be strictly avoided or it will be provided with an arrangement such that process operation will be synchronized.
- Effective maintenance will be introduced to avoid any discontinuity in operation.
- Process operations will be smooth and controlled such that the gaseous load will not exceed the load permitted by MPCB at any point of time.
- To prevent fugitive emissions at raw material gantries/yards, conveyors, silos & all other transfer points proper care will be taken to minimize dust rising. There will not be any falling of raw materials/dusts from the conveyors.
- All the transfer points will be provided with suction arrangement connected to dust collectors. Conveyors will be covered such that during high winds fugitive emissions will not be generated.
- Truck loading & unloading operations will be supervised to reduce fugitive emissions.
- Cleaning and sweeping of floors will be a regular feature.
- A Green Belt around the factory and near the possible sources of fugitive emissions will be developed for reducing the Air Pollution and attenuation of noise.
- Water sprinkling will be carried out on haulage roads to prevent dust rising.

**Noise Environment:**

The adverse impacts due to high noise could be controlled by implementing various control measures listed as below:

- Monitoring of the noise levels and exposures is essential to assess the effectiveness of the Environmental Management Plan implemented to reduce noise levels.
- Acoustic enclosures for noise generating machines
- The operator's cabins (control rooms) will be provided with acoustically insulated special doors and observation windows.

- Noise attenuating devices like ear plug and ear muffs will be provided to protect the workers from the noise levels.
- The operators working in the High-Noise area will be strictly instructed to use ear-muffs/ear-plugs.
- Noise barriers in the form of additional trees are recommended to be grown around administrative blocks, technical site office and other such units. Green belt around the plant area will reduce the noise levels further.

**Water Environment:**

For effective water pollution control, the following measures will be implemented:

- Process modifications will include water recycle/reuse arrangement wherever feasible.
- Flow measuring devices is provided at various water intake points to have precise quantitative assessment of water consumption pattern.
- Regular monitoring and quantification of water requirement at various unit operations will be carried out with a view to devise remedial measures for reduction in fresh water consumption.
- Daily monitoring of influent and effluent from Sewage Treatment Plant as per the present practice will be continue. Complete evaluation of the performance of each unit of the Sewage Treatment Plant will be done regularly.
- Preventive maintenance of water distribution system will be undertaken as a regular feature. All the pipeline/tap leakages will be promptly attended.
- The treated sewage from sewage Treatment Plant is used for gardening after disinfection.

**Land Environment:**

- The EMP for land environment is to scientifically utilize the capabilities of different plant species for attenuation of particulates as well as noise.
- The particulate will be the major pollutants for which commensurate afforestation & Green Belt development programme will be undertaken on priority.

**Socio-economic Environment:**

Recommendations to improve the socio-economics are summarized below:

- Social welfare programmes with reference to health, education, water use, income generation will be organised in the nearby villages.
- The existing as well as augmentation will be undertake environmental awareness programmes through organising group discussion, preparation of audio-visual aids and exhibition on the topic of water, health and sanitation. Programme such as plantation will be conducted in the nearby villages.

**Project Benefits:**

KCSSL produces alloy and special steels for auto industries, engineering industries, nuclear and power generation industries. KCSSL is well known for its quality of special steels.

**KCSSL manufactures special steel which is used by**

1. Ministry of Defense GOI
2. Ministry of Railways GOI
3. Nuclear Power Corporation of India Ltd. (NPCIL)
4. Vikram Sarabhai Space Center (VSSC)
5. Bharat Heavy Electricals Ltd. (BHEL)
6. Export Customers

**Social and Economic benefits:**

The impacts by M/s **Kalyani Carpenter Special Steels Ltd.**, Mundhwa, Pune will be assessed and an appropriate plan of Corporate Social Responsibility (CSR) activity will be planned. Some activities which were noted and will contribute in the social activities are as shown in **Table 6** below;

**Table 6 : Budget for Implementation of CSR**

Sr.	Key Result Area	Total Amount (Lakh)
1	Renovation of existing schools, health centers, community centers etc	KCSSL ,Mudhwa , Pune has earmarked Rupees 67 lakh/annum for the CSR programmes for next three years.
2	Awareness program -Girl Child	
3	Medical Camp	
4	Maintenance of Public Park ( Nehreu Park)	
5	PRATHAM Pune Education Foundation	
6	Sports: Lakshya – Tennis Initiative	

The management of the company has planned to further conduct eye-camp in near future in which cost & medical relief will be provided.

**Budgetary provisions for Environmental Management Plan (EMP):**

KCSSL is always providing adequate budgetary provisions for EMP. Additional budgetary provisions will be made for installation, operation, maintenance, monitoring, and research on different pollution control systems without any diversions of the allocated funds. Total capital cost & recurring cost/annum for environmental pollution control measure for KCSSL given in the **Table 7** below;

**Table 7: Total Capital Cost & Recurring Cost/Annum for EMP**

Sr. No.	Pollution control Equipment	Capex investment (Rs. In lakhs)	Operation & Maintenance cost (Rs. In Lakhs/ year)
1.	RO Plants for Boiler Blowdown	10.00	2.00
2.	RO Plant for Cooling Tower Blowdown	10.00	2.00
3.	CAAQM System	85.00	8.00
4.	Stack Provision for Baghouse	60.00	2.00
5.	Upgradation of S.T.P.	15.00	5.00
6.	Continuous Monitoring System for STP	20.00	3.00
<b>Total</b>		<b>200.00</b>	<b>22.00</b>