ENVIRONMENTAL IMPACT ASSESSMENT

FOR THE PROPOSED EXPANSION OF FOUNDRY UNIT

AT

PLOT NO. KK5, KK6, KK7 (S.F. NO.127PT, 128PT, 131 & 132PT OF INGUR VILLAGE & 213PT, 214PT & 215PT OF PERUNDURAI VILLAGE), SIPCOT INDUSTRIAL GROWTH CENTRE, PERUNDURAI, ERODE DISTRICT

Executive Summary

Project Proponent

JS AUTO CAST

JS AUTO CAST FOUNDRY INDIA PRIVATE LIMITED
Plot No. KK5, KK6, KK7, SIPCOT Industrial Growth Centre, Perundurai

Prepared by

NABET Accredited Environmental Consultant

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1.0 BRIEF DESCRIPTION OF THE PROJECT

M/s. JS Auto Cast Foundry India Private Limited incepted in 2004 is a reputed ductile iron foundry manufacturing raw and machined castings for many internationally renowned brands**.** The production capacity of the foundry located Plot No. KK5, KK6, KK7 (S.F. No.127pt, 128pt, 131 & 132pt of Ingur Village & 213pt, 214pt & 215pt of Perundurai Village), SIPCOT Industrial Growth Centre, Perundurai, Erode District is 1814 Tons per Month of Grey & SG Iron Castings.

Now JS Auto Cast has proposed to increase the capacity of its production to 6000 Tons per Month by installing additional 2 No of induction furnaces (3 Ton each) and upgrading sand plant by replacing sand mixer and adding additional moulding machines, core shooters, shot blasting machines, fettling machines and paint booth. The total cost of proposed expansion project is estimated as Rs. 2000 Lakhs.

As per Environmental Impact Assessment Notification 2006 dated 14th September 2006, the proposed expansion of foundry (secondary metallurgy industry) falls under 'Category B' for which Environmental Clearance (EC) from State Level Impact Assessment Agency (SEIAA) is necessary. In line with EIA Notification dated 14.09.2006, TOR meeting was held for determining Terms of Reference (TOR) on 3rd February 2021 for the preparation of EIA report. Based on TOR conditions given by SEIAA vide its letter No. SEIAA-TN/F.No.7464/3(a)/TOR-877/2020 dated 12.03.2021, the EIA has been prepared.

1.1 Land Requirement

The total area of the existing plant is 11.012 ha and the built-up area is about 1.504 ha. The proposed expansion proposal does not require any additional land area. The land use classification of the project site is industrial estate zone. The land use break-up of the existing and after expansion is tabulated below in **Table-1.**

TABLE - 1: LANDUSE BREAK-UP OF PROJECT SITE

S. No.	Description	Before Expansion		After Expansion	
		Area (Ha)	Percentage (%)	Area (Ha)	Percentage (%)
1	Built-up area	1.504	13.65	1.955	17.75
2	Internal Road	0.955	8.67	1.992	18.09
3	Utility	0.657	5.97	0.657	5.97
4	Green belt	3.258	29.59	3.650	33.15
5	Future Expansion	4.638	42.12	2.758	25.04
	Total	**11.012**	**100**	**11.012**	**100**

1.2 Power Requirement

The power requirement will be increased from 4400 KVA to 9900 KVA after the proposed expansion, which will be sourced from TANGEDCO. To meet the emergency power requirement during the grid failure, a diesel generator of 2000 KVA is already available and is proposed to install two additional DG sets of 500 KVA each. HSD is the fuel used in the plant for DG sets. The requirement of the diesel will vary with power failure & its maximum requirement will increase from 300 lit/day to 450 Lit/day.

1.3 Raw Materials Requirement

The raw materials required for the production of castings including its quantity before and after expansion are tabulated in **Table – 2.** The raw materials are brought in to the plant through trucks from the local market.

TABLE – 2: RAW MATERIAL REQUIREMENT

S. No.	Raw Material	Requirement (Tons/Month)	
		Before Expansion	After Expansion
1	Pig Iron	500	1000
2	Metal Scraps & Borings	1286	3450
3	Runner, Riser & rejects	604	1435
4	Ferro Silicon	20	45
5	Ferro Manganese	10	20
6	Ferro Silicon Magnesium	25	40
7	Inoculants	5	10
8	Silica Sand	200	400
9	Bentonite	50	100
10	Sodium Silicate	10	20

1.4 Water Requirement

The water requirement after the proposed expansion will be increased from 40 KLD to 71 KLD, which is being sourced from the SIPCOT supply. The total water requirement before and after expansion is given in **Table - 3.**

TABLE – 3: WATER REQUIREMENT

S. No.	Category	Requirement (KLD)	
		Before Expansion	After Expansion
1	Sand Moulding	7.5	15
2	Cooling Tower Make up	10	20
3	Domestic purposes	22.5	36
	Total	**40**	**71**

1.5 Man Power Requirement

The manpower requirement of the existing plant is about 500 No which will be increased to 800 No after the proposed expansion. The proposed expansion will also provide indirect employment to about 500 persons. The additional man power requirement is mostly fulfilled by the region of 10 – 15 km radius.

2.0 DESCRIPTION OF THE ENVIRONMENT

2.1 Location and description of the site

The terrain of the land in the plant site is plain and no water streams present in the plant site area. The environmental setting of the proposed plant site is given in **Table - 4**. Study area of 10-km radius around the project site is shown in **Figure - 1**.

TABLE – 4: ENVIRONMENTAL SETTING IN 10-KM RADIUS

S. No.	Particulars	Details
1	Latitude	11°14'14.88"N - 11°14'26.33"N
2	Longitude	77°33'24.27"E - 77°33'36.04"E
3	Elevation above MSL	300 m
4	Land use	Industrial Estate
5	Nearest Highway	SH 96 (Erode – Tiruppur Road) – 2.1 km, N NH 544 (Salem – Kochi Highway) – 2.1 km, NW
6	Nearest Railway Station	Ingur R.S. – 3.3 km, SE Erode Junction – 21 km, NE
7	Nearest Air Port	Coimbatore International Airport – 60 km, WNW
8	Nearest Habitation	Kadappamadai – 0.5 km, N Kuttampalayam – 0.7 km, S Periyavettuvapalayam – 1.2 km, NE
9	Nearest Town	Perundurai – 4 km, NE
10	Nearest Harbour	Cochin, Kerala – 205 km, SW
11	Reserve Forests	Kongapalayam R.F – 6 km, SW Vayppadi R.F. – 7.0 km, SW Chennimalai R.F – 8.5 km, S Villakaradu R.F. – 9 km, SSW
12	Nearest River	Lower Bhavani Canal – 8.0 km, NE Noyyal River – 15 km, S
13	Ecologically sensitive	Nil in 10 km radius
14	Defense Installation	Nil in 10 km radius
15	Historical places	Nil in 10 km radius
16	Socio-economic factors	No Resettlement and Rehabilitation issues are involved

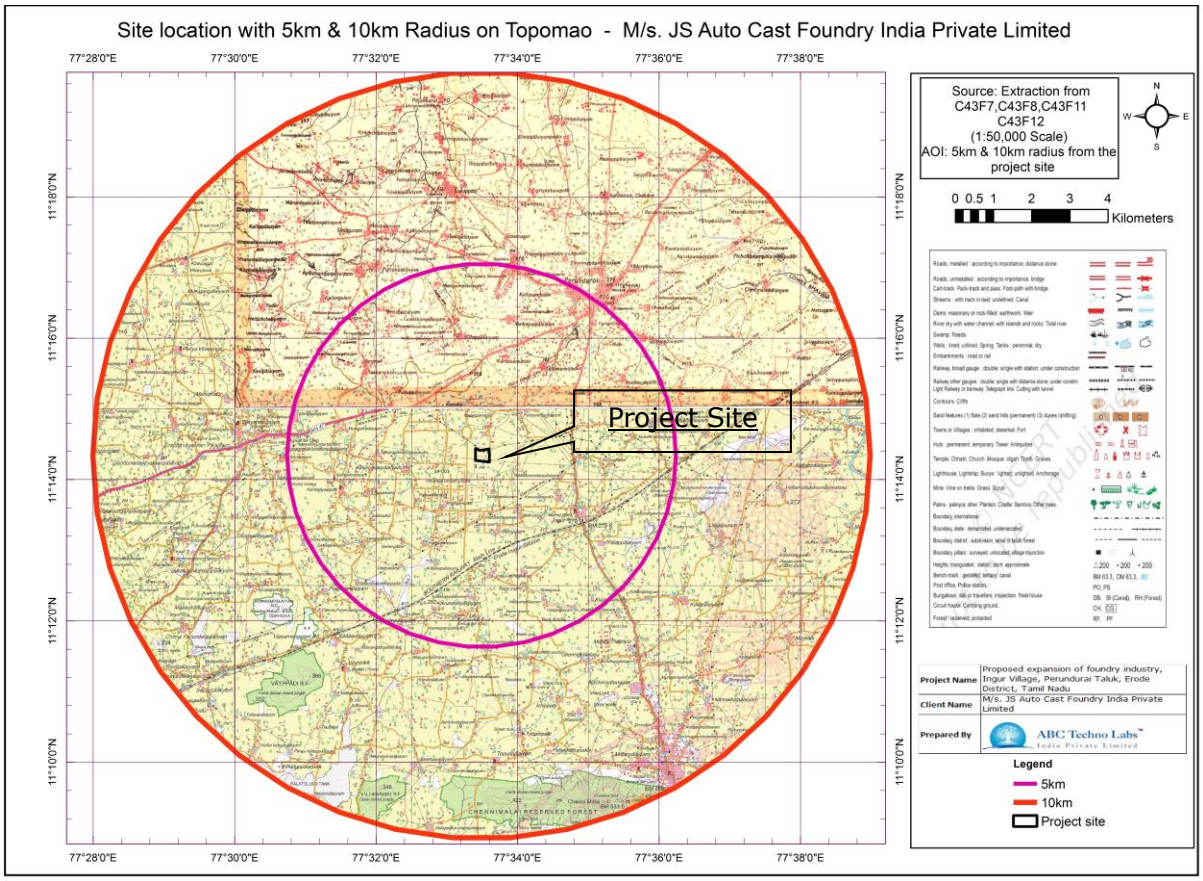

FIGURE-1: STUDY AREA MAP – 10-KM RADIUS

2.2 Baseline environmental monitoring

Baseline environmental monitoring studies for the various environmental attributes were carried out during December 2020 to February 2021 covering the winter season. The details of the base line study are presented as follows:

2.2.1 Meteorology

The predominant wind direction observed during the study period is East for 31% of the total time and followed by East North East for 23% of the total time. The calm conditions were observed for 0.05% of the total time. The mean maximum and mean minimum temperatures recorded at site during study period were 31°C and 20°C. The maximum and minimum relative humidity was observed to be 98.7% and 27.7% respectively during the study period.

2.2.2 Air Quality

Ambient Air Quality Monitoring (AAQM) stations were set up at eight locations. The air samples were analyzed as per standard methods specified by Central Pollution Control Board (CPCB), IS: 5184 and American Public Health Association (APHA).

The maximum value for PM_{10} was observed at Perundurai as 67-µg/m^3 and minimum value for PM_{10} was observed at Kasipillampalayam as 39-µg/m^3. The maximum value for $PM_{2.5}$ was observed at Perundurai as 42-µg/m^3 and minimum value for $PM_{2.5}$ was observed at Krishnapuram as 16-µg/m^3. The maximum value for SO_2 was observed at Ingur as 20-µg/m^3 and minimum value for SO_2 5.0-µg/m^3 was observed at Kadappammadai, Krishnapuram, Ponmudi and Kasipillampalayam. The maximum value for NO_2 was observed at Project site as 29-µg/m^3 and minimum value for NO_2 was observed at Kadappammadai, Ponmudi and Kasipillampalayam as 5-µg/m^3. The concentrations of PM_{10}, $PM_{2.5}$, SO_2 and NO_2 are observed to be well within the standards prescribed by Central Pollution Control Board (CPCB) for rural/residential zone.

2.2.3 Water Quality

The ground water quality monitoring has been conducted at 8 locations covering 10 km radius and it is examined for physico-chemical, heavy metals and bacteriological parameters. The water in general is not fit for drinking as most of the parameters are above the standards prescribed under IS 10500 drinking water standards. The pH value of the ground water in the study area varies between 7.24 and 7.93 and conductivity varies from 1420 to 3870 µS/cm. TDS values were found to be from 884 to 2403 mg/L. The total hardness varied from 560 - 1690 mg/L. The chloride values were found to be in the range 184 mg/L to 1090 mg/L. Metals such as Copper, Lead, Cadmium, Chromium, Arsenic, Selenium, and Mercury were observed to be below detection limit in the ground water samples. The surface water quality at the study area meets the acceptable limits as per IS 10500 drinking water standards.

2.2.4 Soil Quality

Six locations within 10-km radius of the project site were selected for soil sampling. At each location, soil samples were collected from three different depths viz. 30 cm, 60 cm and 90 cm below the surface and homogenized. The homogenized samples were analyzed for physical and chemical characteristics.

It has been observed that the texture of soil is mostly 'Clay' in the study area. It has been observed that the pH of the soil quality ranged from 8.14 to 8.63. The Electrical Conductivity was observed to be in the range of 0.089 to 0.396 mS/cm. Organic Carbon of the soil varied from 0.77 to 1.48%, which indicates the Sufficient level of organic carbon present in the soil. The Nitrogen values ranged between 284 to 497 kg/ha indicating that the soil has 'sufficient' quantity of nitrogen. The Phosphorus values range in between 18.9 to 42.8 kg/ha indicating that the soil is having 'less' to 'medium' quantity of phosphorous. The Potassium values range in between 214 to 402 kg/ha indicating that the soils in the area have 'moderate' to 'high' quantity of Potassium.

2.2.5 Noise Levels

The noise monitoring has been conducted for determination of ambient noise levels at ten locations in the study area. The day time noise level at industrial zone was observed to be 69 dB (A) which is within the prescribed limit of 75 dB (A). The day time noise level at all rural & residential zone was observed to be 52 to 54 dB(A) which is within the prescribed limit of 55 dB (A). The day time noise level at commercial zone was observed to be 64 dB (A) which is within the prescribed limit of 65 dB (A).

The night time noise level at industrial zone was observed to be within the prescribed limit of 70 dB (A), which was 57 dB (A) at project site. The night time noise levels at residential locations were found to be 39 to 43 dB (A) within the prescribed limit of 45 dB (A). The night time noise level at commercial zone was observed to be 54 dB (A) which is within the prescribed limit of 55 dB (A).

2.2.6 Ecology

Vayppadi Reserved forest is located at 7.0 km, SW direction from the project site, Villakaradu Reserved forest is located at 9 km, SSW direction from the project site, Chennimalai Reserved forest is located at 8.5 km, South direction from the project site and Kongapalayam Reserve forest is located at 6 km, SW direction from the project site. No wildlife sanctuaries or national parks or biosphere or hotspots located in 10 km radius from the project site area.

Field survey conducted during the study period revealed that total number of 90 species have been recorded of which maximum of 47 species are accounted for trees followed by 23 species of Herbs & 20 species of Shrubs.

About 69 species of fauna components recorded/reported from study area which are mainly belongs to mammals, birds, reptiles, amphibians and butterflies. Out of observed faunal components 8 species belongs to Schedule-II, 50 species belong to Schedule-IV and 3 species belong to Schedule-V.

3.0 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

The anticipated environmental impacts and mitigation measures are presented in **Table-5**.

TABLE – 5: ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Discipline	Potential Negative Impacts	Probable Source	Mitigation Measures	Remarks
Constructional Impact				
Water Quality	Increase in suspended solids due to soil run-off during heavy precipitation	Loose soil at construction site	During monsoon season run off from construction site will be routed to a temporary sedimentation tank for settlement of suspended solids.	---
Air Quality	Increase in dust and NO_2 concentration	Leveling activity and Vehicular movement	Sprinkling of water in the construction area and unpaved roads. Proper maintenance of vehicles will be done.	The impact will be low, as the main approach road is tarred.
Noise	Increase in noise level	Construction equipment	Equipment will be kept in good condition to keep the noise level within 85-dB (A).	Workers will be provided with necessary protective equipment *e.g.* ear plug.
Terrestrial Ecology	Depression of plant growth	Dust emission from construction	Landscaping and extensive plantation will be done.	Plantation will be done in consultation with the local forest department.
Operational Impact				
Air Quality	Increase in PM, SO_2 and NO_2 levels in ambient air.	Stack emissions and material handling	High efficiency Cassette Filter type fume extraction system will be installed to control the emission from proposed induction furnaces. Dust collectors of required size will be provided for Sand Plant, shot blasting machine, fettling machines and paint trap filters to paint booths. Adequate stack height will be provided as per CPCB guidelines for the proper dispersion of gaseous pollutants. Motor able roads in the plant area will be black topped to reduce dust emission. Plantation programs will be undertaken around the plant area. Dust suppression measures will	The resultant air quality will confirm to the stipulated standards. Particulate emission from the proposed furnaces stack will be kept below 150 mg/Nm^3.

Discipline	Potential Negative Impacts	Probable Source	Mitigation Measures	Remarks
			be implemented material handling area.	
Noise	Increase in noise levels in the plant area.	Equipment in main plant and auxiliaries	Equipment will be designed to conform to noise levels prescribed by regulatory agencies. Providing acoustic enclosure as source control. Provision of green belt and plantation would further help in attenuating noise.	Employees working in high noise areas would be provided earplugs as protective device.
Water Quality	Deterioration of surface water quality.	Discharge from domestic usages.	Adequate capacity of Sewage Treatment Plant is already provided for treatment of sewage.	Entire quantity of treated sewage will be reused in green belt.
Solid waste	Burnt sand, Furnace slag and dust from filter	From knockout section, furnaces and APC measures	Burnt sand will be sent back to the sand mixer to use multiple times. The furnace slag will be used in cement plant / road laying material.	Efforts will be made to utilize the solid waste to the extent possible.
Ecology				
a. Terrestrial	Impact on plant species	Emissions from stack	Emission will be controlled as well as dispersed through appropriate design.	As ambient air quality will be within limits, no active injury to the vegetation is expected.
b. Aquatic	Impact on aquatic life of the water bodies	Domestic Sewage	The domestic wastewater will be provided with adequate treatment facilities (STP)	As the sewage water will be treated properly no significant impact on aquatic life is expected.
Demography and Socio-economics	Strain on existing amenities like housing, water sources and sanitation, medical and infrastructure facilities.	Influx of people of proposed expansion employees as well as contractor's employees/ labourers.	Most the worker requirement will be fulfilled by local people. No significant impact is envisaged	Overall socio-economic status of the area is expected to improve.

4.0 ENVIRONMENTAL MONITORING PROGRAM

Environmental monitoring will be conducted on regular basis by JS Auto Cast to assess the pollution level in the surrounding area. A comprehensive monitoring program is suggested in **Table – 6.**

TABLE – 6: MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S. No.	Component	Parameter	No of Locations	Frequency/ Duration
1	Ambient Air Quality	PM_{10}, $PM_{2.5}$, SO_2, NO_2, CO, Pb, As, Ni, NH3, O_3, C_2H_6 & BAP.	4	Once in a month
2	Fugitive Emission	PM_{10}, $PM_{2.5}$, SO_2, NO_2 & CO	4	Once in a month
3	Stack Emission Monitoring	PM, SO_2, NO_2, CO & HC	15	Once in a month
4	Source Noise	Instantaneous Noise level in dB(A)	8	Once in a month
5	Ambient Noise Quality	Ambient noise level (L_{eq}, L_{Day} & L_{Night})	8	Once in a month
6	Ground water Quality	Parameters specified under IS:10500, 1991	1	Once in 3 months
7	Soil Quality	Parameter for soil quality: pH, texture, EC, Organic Matter, N, P, K, Na, Ca & Mg	1	Once in a year

5.0 ADDITIONAL STUDIES

A preliminary risk assessment study, disaster management plan & occupational health & safety has been carried out for the proposed expansion project and associated facilities like HSD storage and the broad conclusions are as follows:

- There will be no significant community impacts or environmental damage consequences; and

The hazardous event scenarios and risks in general at this facility can be adequately managed to acceptable levels by performing the recommended safety studies as part of detailed design, applying recommended control strategies and implementing a Safety Management System.

6.0 PROJECT BENEFITS

The basic requirement of the community needs will be strengthened by extending health care, educational facilities to the community, strengthening of existing roads in the area. JS Auto Cast will initiate the above amenities either by providing or by improving the facilities in the area, which will help in uplifting the living standards of

local communities. Medical facilities will be augmented in dispensaries located near the project site which will be beneficial to the local people in the surrounding villages. The proposed expansion foundry project will result in improving the social infrastructure in following manner:

- Generation of employment and improved standard of living;
- Establishment of small scale ancillary & supply industries;
- Increased revenue to the state by way of royalty, taxes and duties;
- Improved communication and transport facilities etc.

The total manpower required for the proposed expansion project during the operation phase is about 800 persons which would be mainly sourced from local community in and around the foundry and few technical persons will be employed from outside area. In addition to the above, indirect employment opportunities shall arise after expansion of the foundry.

7.0 EMP - ADMINISTRATIVE ASPECTS

A permanent organizational set up will be formed to ensure the effective implementation of mitigation measures and to conduct environmental monitoring. The major duties and responsibilities of Environmental Management Cell will be as follows:

- To implement the environmental management plan;
- To ensure regular operation and maintenance of pollution control devices;
- To assure regulatory compliance with all relevant rules and regulations;
- To minimize environmental impacts of operations by strict adherence to the EMP;
- To initiate environmental monitoring as per approved schedule;
- Review and interpretation of monitored results and corrective measures in case monitored results are above the specified limit;
- To report the non-compliances / violations of the environmental norms to the board directors of the company.

Normal activities of the EMP cell will be supervised by General Manager of the unit who will report to the Managing Director. Environmental Engineers & Technicians are report the issues to the GM to make the possible preventive actions.

8.0 CONCLUSIONS

The proposed expansion of foundry project will have certain level of marginal impacts on the local environment. However, development of this project has certain beneficial impact / effects in terms of providing the employment opportunities that the same will create during the course of its setting up as well as during operational phase of the project. Thus, it can be concluded that with the judicious and proper implementation of

the pollution control and mitigation measures, the proposed expansion project will be beneficial to the society and will help reduce the demand – supply gap of Grey Iron & SG Iron Castings and will contribute to the economic development of the region in particular and country in general.