EXECUTIVE SUMMARY

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1.0   INTRODUCTION

M/s.Mashiva Steel and Alloys LLP (hereafter referred as MSAL) is in operation of its unit with existing environment clearance from SEIAA CG (700/SEIAACG / IND/ Raigarh / 636 Dated 08.02.2017) and Consent under Water Act and Air Act from CECB (6653/TS/CECB/2018 dated 14.12.2018) for its 59400 TPA MS Billetsproductionthrough Induction Furnaces. Now, MSAL proposes to expand its production capacity from 59400 TPA to 142560 TPA MS Billets by setting two additional Induction furnaces and augmenting the capacity of existing two furnaces to 12 Tons each.

As per Environmental Impact Assessment Notification dated 14th September, 2006 and subsequent amendment thereof. The proposed project falls under "Category B1", Schedule 3 (a) and requires Environmental Clearance (EC) to be obtained from SEAC/SEIAA, Chhattisgarh.

Anacon Laboratories Pvt. Ltd., Nagpur, is QCI-NABET accredited in 'Category A' environment consultant organization has been assigned to undertake an Environmental Impact Assessment (EIA) study and preparation of Environment Management Plan (EMP) for various environmental components, which may be affected due to the impacts arising out of the proposed expansion project.

The online application for prior Environmental Clearance (Form-1) was submitted to SEIAA/SEAC, Chhattisgarh on Dated 15.05.2019 for proposed expansion project. The proposal was considered by the State Expert Appraisal Committee (SEAC) during its meeting held on 15th May 2019. The SEAC has suggested standard Terms of References (ToR) (Vide Letter no. 553/SEACCG/Raipur/815dtd.27.07.2019) for preparation of the draft EIA-EMP Report.

Environmental baseline studies were carried out during in Pre-Monsoon Season 2019. This EIA report is prepared based on the ToR conditions recommended by SEAC, Chhattisgarh and project related technical details provided by M/s. Mashiva Steel and Alloys LLP.

1.1   IDENTIFICATION OF PROJECT

M/s. Mashiva Steel and Alloys LLP, proposed expansion of Induction Furnace from 59400 TPA to 142560 TPA (M.S Billet Facilities) at Plot No. 196 and 198(A), OP Jindal Industrial Area, Punjipathra, Village- Tumidih, Tahsil- Gharghoda, District- Raigarh (CG).

1.2   LOCATION OF THE PROJECT

Plant is located at OP Jindal Industrial Area, Punjipathra, Village- Tumidih, Tahsil- Gharghoda, DistrictRaigarhof Chhattisgarh State. The nearest city is Raigarh which is around 18.4 km in south south east direction. Nearest airport is SwarmiVivekanand International Airport at Raipur which is around 191 KM at SW direction. The nearest roadway is State Highway 1 (SH-1) RaigarhAmbikapur Highway which is 1.8 KM in East direction. The proposed expansion project will be coming up within the existing premises.The study area of 10 km radial distance from the project site is shown in **Figure 1**.

1.3   EIA/EMP REPORT

In line with the approved ToR obtained from SEAC, Chhattisgarh, baseline environmental monitoring was carried outduringPre monsoon season (15th March 2019 to 15th June 2019)for determining the status of ambient air quality, ambient noise levels, surface and groundwater quality, soil quality, status of flora, fauna and eco-sensitive areas and socio-economic status of the villages within 10 km radius study area from the project site.**(figure 1)** The observations of the studies are incorporated in

the draft EIA/EMP report. Impacts of the proposed project activities during construction and operation stages were identified and duly addressed in the draft.

EIA/EMP report alongwith the proposed management plan to control / mitigate the impacts. Environmental Management Plan is suggested to implement the pollution control in the project.
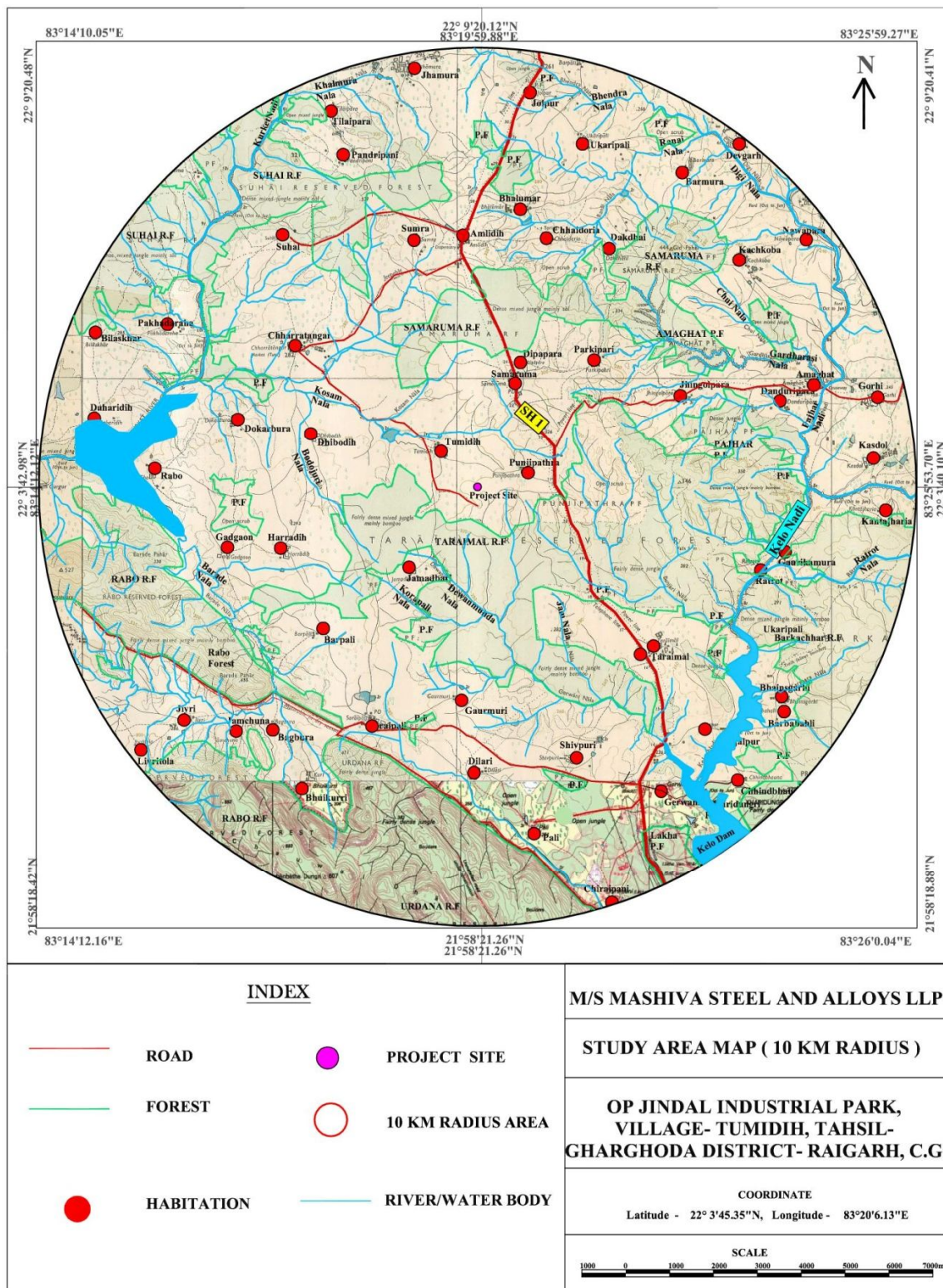

FIGURE 1: STUDY AREA (10 KM RADIAL DISTANCE)

TABLE 1
DETAILS OF ENVIRONMENTAL SETTINGS

Sr. No.	Particulars	Details
1.	Project Location	OP Jindal Industrial Area, Punjipathra, Plot No. 196 and 198(A), Village- Tumidih, Tehsil- Gharghoda, District- Raigarh (CG)
2.	Co ordinate	Latitude:- 22° 3'45.35" N Longitude:- 83°20'6.13" E
3.	Toposheet No.	No.64 N/8
4.	Climatic Conditions	Mean annual rainfall is 1394 mm Temperature : Pre monsoon $20.5\,^{0}C$ (Min.) $41.4\,^{0}C$(Max.) : Winter $13.1\,^{0}C$ (Min.) $30.8\,^{0}C$ (Max) : Post monsoon $17.5\,^{0}C$ (Min.) $32.4\,^{0}C$(Max.) Source: IMD, Raigarh
5.	Nearest IMD station	IMD Raigarh – 18.4 km (SSE)
6.	Land Form, land Use and Ownership	Existing Industrial Land.
7.	Site topography	Project Site – MSL-308m (Max.) & MSL-303m (Min.) Study Area - MSL-580m (Max.) & MSL-213m (Min.)
8.	Nearest roadway	SH 1 (Ambikapur Highway) – 1.8 Km, E.
9.	Nearest Railway Station	Bhupdeopur Railway Station – 12.5 Km, SW.
10.	Nearest Air Port	Swami Vivekanand International Airport – 191 km (SW)
11.	Nearest Port	NA
12.	Nearest lake	NA
13.	Nearest State/National Boundaries	Madhya Pradesh – 202 km (W) Maharashtra – 317 km (WSW) Odisha – 24 km (E)
14.	Nearest major city with 2,00,000 population	Nearest city – Raigarh – 18.4 km (SSE)
15.	Distance for sea coast	NA
16.	Hills/valleys	NA
17.	Nearest Reserved/ Protected forests	None
18.	Nearest water bodies	<u>Nearest rivers</u> : Kelo River – 7.7 Km, E. PajharNadi – 7.6 Km, E. Rabo Dam-7.67 km-WNW <u>Nearest lake</u> : Kelo Reservoir – 7.01 Km, SE.
19.	Areas already subjected to pollution or environmental damage	Project located within OP Jindal Industrial Park. Park does not classify or notified as severally or critically polluted area.
20.	Seismic zone	The proposed expansion project site falls in zone-II as per IS 1893 (Part-I): 2002. Hence, seismically, it is a stable zone.

2.0   PROJECT DESCRIPTION

2.1   PROCESS DESCRIPTION

2.1.1   Manufacturing process of Steel Melting Shop with CCM

- The manufacturing process identified for the proposed expansion unit is one which is well established and proven and presently being followed by majority of similar manufacturing units mostly in small or medium scale sector.

- In order to achieve high energy efficiency four numbers of Induction Furnaces (12 MT capacity each) with higher power input capacity will be setup with completely automatic charging facility as well as power sharing panel also. Electronic software will be installed to monitor the input power and maintaining power factor to almost unity level.

- The melting process involves taking sample of Sponge Iron & Pig Iron; Iron Powder and mild steel scrap, Defective Billets or scrap from user units is taken from raw material storage. This is then tested for its chemical composition and noted. Before preparation of charge necessary ingredients like Ferro Manganese, Ferro Silicon etc. are added by weight, Flux is taken up in crucible and then charge is put into it. Melting of steel along with other alloying element is accomplished in the crucible of coreless M.F. Induction Furnace.

- The high A.C. Current is passed through the copper oil wrapped around the outer periphery of crucible. By transformer action the A.C. Current induces much higher secondary current at 1000 hertz in charge through the coil. Enormous heat it thus developed by resistance which causes the melting of charge. As soon as the molten pool is formed very pronounced stirring action in the molten metal takes place which helps in accelerating the melting. Deoxidizing agents and sometimes specific alloying elements are also added at suitable intervals during melting. Melting of homogenous mass occurs at 1600^0C. If necessary superheating up to 1650 ^{0}C as done for specific time. After completion of melting cycle of an hour the homogeneous molten mass is poured hydraulically into the ladle.

➤ **Continuous Casting Machine (CCM):**

- The ladle containing liquid steel will be placed on the CCM platform and continuous casting of hot billet will be carried out in the same for which CCM is setup, the casting will be done through a highly automated controlled cooling software governed mechanism by which the casted billet will be so cooled that the temperature of billets do not fall below 1050^0C. the cast the molten metal in required shapes.

2.2   LAND REQUIREMENT

No additional land required, existing lease hold land 2.76 Hectare is adequate for the aforesaid expansion. Thus, no change in land use is involved. The land details are provided as follows:

TABLE 2
LAND UTILIZATION PATTERN

Sr. No.	Particulars	Area (In Hectare)	Percentage (%)
1.	Factory Shed & Building	0.53	19.20
2.	Road & Paved Area	0.10	3.62
3.	Open Area	1.16	42.03
3.	Green belt	0.97	35.14
	Total Area	**2.76**	**100.00**

2.3   RAW MATERIALS REQUIREMENT, SOURCE & MODE OF TRANSPORT

The raw material will be transported through truck. It is estimated that approx. 53 trucks/day required for transportation of raw materials and finished products of the plant

2.3.1   Solid and Hazardous waste generation

Total Solid wastesgeneration through processis estimated to be about 20745 MT/Yr which includes Defective Billet3852MT/Year, Induction Furnace Slag 16788 MT/Year, and Refractory Waste 105 MT/Year. Waste oil/used oil will be 3 KL/Yr which are classified as hazardous waste.

2.4   WATER REQUIREMENT & SOURCE

The total makeup water requirement for the project will be 66m³/day. (03 KL for domestic purpose).The water will be source from subsurface i.e. groundwater. According to CGWB the area falls under Safe zone for ground water development.

2.5   POWER REQUIREMENT & SUPPLY

Power requirement will be around 12 MW which will be drawn from JSPL power supply network. An emergency backup DG set of 500 KVA are already in place.

2.6   MANPOWER REQUIREMENT

The existing manpower is 43 whereas additional manpower requirement for proposed expansion project of M/s. Mashiva Steel and Alloys LLP will be 22 nos. during operation phase. Thus, the total manpower will be 65 people after proposed expansion activities. Preference will be given to local people, depending upon their qualification and skill. Marginal employment will also generate during construction phase.

2.7   FIRE FIGHTING FACILITIES

In order to combat any occurrence of fire in plant premises, fire protection facilities are envisaged for the various units of the plant. All plant units, office buildings, laboratories, etc. will be provided with adequate number of portable fire extinguishers to be used as first aid fire appliances.

2.8   PROJECT COST

The project cost for expansion of the project is estimated asRs. 505Lakhs.

3.0   EXISTING ENVIRONMENTAL SCENARIO

3.1   BASELINE ENVIRONMENTAL STUDIES

Baseline environmental studies were conducted at project site along with 10 km radial distance from the project site. The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, Land were monitored during Post monsoon season (15th March 2019 to 15th June 2019).

3.2   METEOROLOGY & AMBIENT AIR QUALITY

Summary of the Meteorological Data Generated At Site (15th March 2019 to 15th June 2019)

Predominant Wind Direction	Pre monsoon season
First Predominant Wind Direction	WNW (10.53 %)
Second Predominant Wind Direction	W (9.30 %)
Calm conditions (%)	0.46
Avg. Wind Speed (m/s)	2.40

The status of ambient air quality within the study area was monitored for pre-monsoon season for at 8 locations covering project site, Punjipathra, Dhibodih, Harradih, Barpali, Shivpuri, Parkipari and Kantajharia. Total 8 sampling locations were selected based on the meteorological conditions considering upwind and downwind, cross wind directions and reference point. The levels of Respirable Particulate Matter (PM_{10}), Fine Particulates ($PM_{2.5}$), Sulphur Dioxide (SO_2,), Oxides of Nitrogen (NO_X) and carbon monoxide (CO), Ammonia, Ozone, Benzene and BAP were monitored. The details of Ambient Air Quality Monitoring Results are summarized and given in **Table 3**.

TABLE 3
SUMMARY OF AMBIENT AIR QUALITY MONITORING RESULTS

Sr. No.	Location		PM_{10} $\mu g/m^3$	$PM_{2.5}$ $\mu g/m^3$	SO_2 $\mu g/m^3$	NO_2 $\mu g/m^3$	CO mg/m^3	Ozone $\mu g/m^3$	NH_3 $\mu g/m^3$
1.	Project Site	Min	57.8	19.3	9.5	23.1	0.287	8.2	6.3
		Max	86.2	28.7	19.7	30	0.354	11.2	9.8
		Avg	72.3	24.6	16.0	25.9	0.317	9.7	8.0
		98th	85.8	28.6	19.7	29.8	0.347	11.1	9.8
2.	Punjipathra	Min	50.5	18.4	11.1	18.2	0.264	6.3	4.2
		Max	75.3	26.1	14.2	26.3	0.347	11.8	9.9
		Avg	66.1	22.5	12.6	21.8	0.323	8.0	6.5
		98th	75.1	25.9	14.2	25.3	0.346	11.6	9.8
3.	Dhibodih	Min	64.1	22.1	5	14.8	0.377	7.9	5.8
		Max	84.9	29.8	15.4	23.1	0.429	13.5	10.2
		Avg	74.2	25.7	9.6	18.4	0.410	10.9	7.5
		98th	84.3	29.6	14.9	22.6	0.429	13.0	10.1
4.	Harradih	Min	52.6	18.8	8.8	18.9	0.317	7.2	5.2
		Max	75.5	27.1	14.1	26.7	0.369	10.4	8.6
		Avg	64.0	22.7	11.6	22.1	0.347	8.6	6.9
		98th	75.1	26.7	14.0	26.1	0.369	10.4	8.5
5.	Barpali	Min	42.4	15.3	7.4	14.1	0.317	9.8	5.4
		Max	60.4	22.4	15.1	23.6	0.369	15.3	10.6
		Avg	51.1	18.0	9.7	17.9	0.348	11.8	7.8
		98th	60.2	21.8	14.9	23.0	0.369	15.2	10.4
6.	Shivpuri	Min	64.3	19.7	9	20.8	0.337	8.8	7.2
		Max	85.1	28.7	20.1	29.1	0.389	14.4	11.6
		Avg	74.4	24.7	13.6	24.4	0.370	11.7	8.9
		98th	84.5	28.5	19.3	28.6	0.389	13.9	11.5
7.	Parkipari	Min	46.4	15.5	4.7	15.0	0.267	7	6.1
		Max	72.1	24.0	13	21	0.319	10.5	10.4
		Avg	59.3	19.8	8.8	18.0	0.301	8.7	7.8
		98th	71.7	23.9	12.9	21.0	0.319	10.4	10.3
8.	Kantajharia	Min	54.7	18.2	8.8	21.5	0.347	11.5	8.4
		Max	77.6	25.9	14	29	0.401	14.6	11.8
		Avg	66.1	22.0	11.5	24.7	0.378	12.9	10.0
		98th	77.2	25.7	13.9	28.5	0.400	14.6	11.7
CPCB Standards			100 (24hr)	60 (24hr)	80 (24hr)	80 (24hr)	2 (8hr)	100 (8hr)	400 (24hr)

From the above results, it is observed that the ambient air quality at all the monitoring locations was within the permissible limits specified by CPCB.

3.3   AMBIENT NOISE LEVELS

Ambient noise level monitoring was carried out at the 08 monitoring locations; those were selected for ambient air quality monitoring. The monitoring results are summarized in **Table 4.**

TABLE 4
SUMMARY OF AMBIENT NOISE LEVEL MONITORING RESULTS

Sr. No.	Monitoring Locations	Equivalent Noise Level	
		Leq_{Day}	Leq_{Night}
Residential Area			
1.	Taraimal	46.1	38.7
2.	Gaurmuri	51.7	41.9
CPCB Standards dB(A)		**55.0**	**45.0**
Commercial Area			
3.	Jamadbari	52.9	41.6
4.	Dhibodih	51.9	43.8
CPCB Standards dB(A)		**65.0**	**55.0**
Silence Zone			
5.	Samaruma	47.1	37.2
6.	Tumidih	48.6	37.2
CPCB Standards dB(A)		**50.0**	**40.0**
Industrial Area			
7.	Project Site	61.7	52.9
8.	Punjipathra	51.4	41.6
CPCB Standards dB(A)		**75.0**	**70.0**

Source: Field monitoring and analysis by Anacon Laboratories Pvt. Ltd., Nagpur

3.4   SURFACE AND GROUND WATER RESOURCES & QUALITY

3.4.1   Local Geology

The lithology in 10 km study area mainly consists of Undeformed and unmetamorphosed sedimentary sequence of rocks belonging to Chhattisgarh Super group of Proterozoic age, conglomerate variegated sandstone with cay, shale and coal and some part of the study area also consist of Calc-argillite and Glauconite quartz arenite and shale. The study area around the project site does not have major faults or shear zone.

3.4.2   Local Hydrogeology and Aquifer Systems

Hard rock mainly consist of limestone, shale, dolomite and sandstone belong to Chhattisgarh Super group of Proterozoic age. Ground water occurs in phreatic condition in the weathered mantle of these rocks, The aquifer material controlling ground water flow can be broadly divided into two major media (1) Fractured media and (2) Porous media. The weathered mantle and shallow fractures mainly constitute the shallow aquifers and most of the study area consist of discontinuous, confined to semi-confined aquifers, restricted to weathered Zone and fractured contact zone. The sandstone of Kamthi and Barakar formation are the main source rocks which has good yielding capacity of the water. The thickness of weathered mantle varies from 5 to 20 mbgl. Nearly 90% of wells are in the depth range between 5 and15 mbgl.

Pre-monsoon water level: 4.8 – 9.5 mbgl

Post- monsoon water level: 3.2 - 5.2 mbgl

3.4.3   Geomorphology

Geomorphologically the district is having matured type of land forms and can be broadly divided into two prominent geomorphic units. These are

1.   Dissected Pediplain made by Proterozoic shale- limestone dolomite area.

2.   Alluvial Plain formed by Seonath-Mahanadi Alluvium.

The Central Chhattisgarh Plain is represented by Structural Plain on Proterozoic &Gondwanarocks which cover most of the part of study area. They are having gently sloping erosion surfaces and thin to moderate cover of soil and other part of the study area covered by denudational hills, pediments & valley on the other rocks. The Topography of the surrounding area is near about flat and no major geomorphic feature is present.

On the basis of geomorphological map and their features, it shows that Kelo River flows from N to S direction and located in E side of the project area and on the basis of drainage morphology drainage pattern is dendritic.

3.4.4   Water Quality
Groundwater and surface water quality was assessed by identifying 8 groundwater (Borewell/ handpump) locations in different villages and 5 surface water samples.

A. Groundwater Quality

The analysis results indicate that the pH ranged between 6.67-7.92. The TDS was ranging from 168-342 mg/l. Total hardness was found to be in the range of 100.58-181.15 mg/l. The fluoride concentration was found in the range of 0.1-0.32 mg/l. The nitrate and sulphate were found in the range of 7.46-90.64 mg/l and 3.11-12.17 mg/l respectively. Heavy metals content (i.e. As, Al, Cd, Cr, Cu, Pb, Mn, Zn and Hg) were found to be below detection limit and within specified standards.

Sr. No.	Locations	WQI	Quality	Remark
1	Project Site	57.75	Good	
2	Punjipathra	43.23	Excellent	
3	Dilari	30.05	Excellent	**Water quality assessed based upon above physico-chemical parameters and most samples are physico-chemically good to excellent**
4	Shivpuri	41.01	Excellent	
5	Taraimal	48.11	Excellent	
6	Ratrot	30.01	Excellent	
7	Dhibodih	33.47	Excellent	
8	Chhaidoria	36.27	Excellent	

B. Surface Water Quality

The analysis results indicate that the pH ranged between 7.54-7.91 which are well within the specified standard of 6.5 to 8.5. The pH of water indicates whether the water is acid or alkaline. The TDS was observed to be 116-284 mg/l which is within the permissible limit of 2000 mg/l.The total hardness recorded was in the range of 51.36-154.08 mg/l as $CaCO_3$ which is also within the permissible limit of 600 mg/l. The levels of chloride and sulphate were found to be in the range of 23.5-79.42 mg/l and 5.83-58.31 mg/l respectively.

Dissolved oxygen (DO) refers to the amount of oxygen (O_2) dissolved in water. Because fish and other aquatic organisms cannot survive without oxygen, DO is one of the most important water quality parameters. The reported value of range of 6.3-6.4 mg/lt.Phosphorus (as PO_4) is an important nutrient for plants and algae. Because phosphorus is in short supply in most fresh waters, even a modest increase in phosphorus can cause excessive growth of plants and algae that deplete

dissolved oxygen (DO) as they decompose. Heavy metals content (i.e. As, Al, Cd, Cr, Cu, Pb, Fe, Mn, Zn and Hg) were found to be very low and within specified standards.

C. Bacteriological Characteristics

Coliform group of organisms are indicators of faecal contamination in water.Bacteriologically, all surface water samples were contaminated and water treatment followed by chlorination or disinfection treatment is needed before use for domestic purpose whereas groundwater samples were not bacteriologically contaminated.

3.5   LAND USE LAND COVER CLASSIFICATION

The land-use & land cover map of the 10 kmradial study area from the periphery of project site has been prepared using Resource SAT-1 (IRS-P6), sensor-LISS-3 having 23.5m spatial resolution and date of pass 15th April 2018satellite image with reference to Google Earth data. In order to strengthen the baseline information on existing land use pattern, the following data covering 10 km radius is approximate about 21°58'12.33"N to21°08'55.51"N latitude and 83°14'18.29"Eto 83°25'52.06"Elongitude and elevation 230 – 588 meter are used as per the project site confined within that area.

The Land Cover classes and their coverage are summarized in **Table 5.**

TABLE 5

S.No.	Level-I	Level-II	Area (Sq.Km²)	Percentage (%)
1	Built-up land	Settlement	10.25	3.26
		Industrial Infrastructure	8.69	2.77
		Road Infrastructure	0.74	0.24
2	Agricultural Land	Cropland	98.57	31.4
		Barren Land	1.1	0.35
3	Forest Land	Reserve forest / Protected Forest	163.92	52.2
4	Scrubs	Open Scrub	6.87	2.19
5	Water bodies	Canal/River/Pond/ Tank	22.36	7.12
6	Others	Brick Kiln	0.56	0.18
		Mining Area	0.94	0.29
	Total		**314**	**100**

3.6   SOIL QUALITY

For studying soil quality of the region, sampling locations were selected to assess the existing soil conditions in and around the proposed project site representing various land use conditions. The physical, chemical properties and heavy metals concentrations were determined. The samples were collected by ramming a core-cutter into the soil up to a depth of 30 cm. Total 8 samples within the study area were collected and analyzed.

Physical Characteristics of Soil

From the analysis results of the soil samples, it was observed, the bulk density of the soil in the study area ranged between **1.49-1.68**g/cc which indicates favorable physical condition for plant growth. The

water holding capacity is between **19.05-21.44**%. Infiltration rate, in the soil is in the range of **16.92-20.26**mm/hr.

Chemical Characteristics of Soil

pH is an important parameter indicative of alkaline or acidic nature of soil. It is found to be neutral to moderately alkaline (**5.71-8.2**) in reaction. Electrical conductivity, a measure of soluble salts in the soil is in the range of **62.29-332.8** µS/cm. The important soluble cations in the soil are calcium and magnesium whose concentration levels ranged from **242.63-422.25** mg/Kg and **102.61-212.69** mg/Kg respectively. Chloride is in the range of **282.59-386.79** mg/Kg.

3.7   BIOLOGICAL ENVIRONMENT

Floral composition in Study Area

Floral characteristics within project site and surrounding areas including various villages were studied during post-monsoon season. Total 143 floral species were observed in the study area. The details about the floral composition are as follows.

a. **Trees:** Total 94 species were found in the study area

b. **Shrubs (small trees):** Total 16 species were enumerated from the study area.

c. **Herbs:** In the study area 15 species were observed.

d. **Bamboo & Grasses: 15** species were enlisted from the study area

e. **Climbers and Twiners:** Total 12 species of climbers/ twiners were recorded in the study area.

f. **Parasite :** Each 1 species enlisted in the area

RET STATUS

According to IUCN Status report 2013 out of total 92 plant species identified within study area among the observed species *Chloroxylonswietenia*which is Vulnerable (VU) species as per IUCN Ret list. The other identified plant species in the study area belongs to least concern (LC), Data Deficient (DD) and Data not available (NA), as per IUCN status. Thus, none of reported species in study area belongs to Rare, Endangered or Threatened category.

Fauna Details:

As per IUCN RED (2013) list

The IUCN Red List is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as the most authoritative guide to the status of biological diversity.

Among the reported animals, the categorization of species as per IUCN is as follows:

Mammals:*Elephasmaximus* – Asiatic Elephant (Endangered) *Melursusursinus*– Sloth Bear (Vulnerable),Hyaena*hyaena* – Hyena (Near Threatened)

Reptiles:*Python molurus* – Indian Python (Threatened)

Avifauna: Nil as per IUCN.

As per Indian Wild Life (Protection) Act, 1972

Wild Life (Protection) Act, 1972, as amended on 17th January 2003, is an Act to provide for the protection of wild animals, birds and plants and for matters connected therewith or ancillary or incidental thereto with a view to ensuring the ecological and environmental security of the country.

Some of the sighted fauna was given protection by the Indian Wild Life (Protection) Act, 1972 by including them in different schedules. Among the birds in the study area, Pea fowl (*Pavocristatus*), is included in schedule I of Wild life protection Act (1972), while many other birds are included in schedule IV.

Among the reptiles, *Python molurus*(Indian Python) and *Varanusbengalensis*(Bengal Monitor Lizard) categorized as Schedule –I Whereas, Indian Cobra (*Najanaja*), Common rat snakes (*Ptyasmucosus*), are provided protection as per Schedule-II of Wild life protection act, (1972).

Among mammals; *Elephasmaximus* – Asiatic Elephant and *Melursusursinus*– Sloth Bear Categorised under Schedule – I. Whereas, Mongoose (*Herpestesedwardsi*), *Macacamulata* (Rhesus macaque), Jungle cat (*Felischaus*), Indian Fox (*Vulpesbengalensis*) are schedule –II animals. Wild boar (*Sussucrofa*) and *Hyaenahyaena*(Hyena) is protected as Schedule-III animal and Hares & Five striped squirrel are included in schedule IV of Wild Life Protection act 1972. Fruit bat & Rats protected in Schedule V of Wild Life Protection act 1972.

3.8 SOCIO-ECONOMIC ENVIRONMENT

Information on socio-demographic status and the trends of the communities in the 10 km radius was collected through primary social survey and secondary data collection from census 2011 & District Census hand book 2011. Summary of the socio-economic status of the study area is given in Table 1. Details regarding education and infrastructure facilities 2011 are presented in Table 2 respectively

TABLE 6
SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT OF VILLAGES WITHIN 10 KM RADIUS AREA

No. of villages	40
Total households	8366
Total population	33778
Male Population	17303
Female population	16475
SC Population	3380
ST Population	16326
Total literates	20957
Total Illiterates	12821
Total workers	15801
Total main workers	11005
Total marginal workers	4796
Total non-workers	17977

Source: Primary census abstract 2011, district Raigarh, state Chhattisgarh.

TABLE 7
INFRASTRUCTURE FACILITIES AVAILABLE IN THE STUDY AREA

Yr. 2011	In percentage (%)									
	Educ ation	Drink ing water	Road	Power	Comm unicati on	Transp ortation	Govt. PHC & SC	Social Security	Drainage	Recreation
Availa bility	100	100	95	100	77	44	21	5	69	74

Source: District census handbook, District Raigarh, state Chhattisgarh.

SALIENT OBSERVATION OF THE SOCIO-ECONOMIC SURVEY

➢ **Employment**: Main occupation in the study area was agriculture and Labor Work its allied activities eg. Cattle rearing, dairy farming, agro-horticulture, bamboo-agricultural crop patterns, floriculture, bee-keepings etc. Other income generation sources of the area, small business; private jobs etc. The labors were getting daily wags in the range of 300-350 Rs, depending on type of work they set. It is observed that the Raigarh District is having huge scope for employment as industrialization is more in this area. But due to lack of Vocational training centers in the area the Industries are outsourcing some of the key employees from other areas.

➢ **Agriculture and labor** - Main occupations are mostly day labour and agriculture but other business includes preparation of leaf tray, leaf cups, collection of Mahua for the preparation of countryside liquor. People in the study area resort to rearing of livestock as a source of income. As per the local interview during field survey, it was observed that the most common animal reared by the people are cow, buffalo, poultry and goat.

➢ **Major crops of study area, production & yield**: About 45% of the study area, as per site survey, belongs to the agricultural land category. Both (Rabi and Kharif) type of cropping practice is prevailing in this area and the type of crops includes paddy, ragi, green gram and black gram. Til, groundnut, mustard, jute, sugar cane etc are the major commercial crops grown in the study area. Banana and mango are the major fruits grown in this area.

➢ **Migration from other states**: Main industries were coal washery, power plant, steel industry etc. in the study area Migration from other states eg. UP, Bihar &Odisha for employment purpose found in the study area.

➢ **Education facilities**: The Primary & secondary data reveals that literacy levels in all the villages is varying from 60 to 80 %. Most of the students in Villages in the study area are going to Raigarh town for their studies which is about 23 Kms. from the plant. The schools are also not having proper infrastructure facilities. College facility is available in Traimal and Raigarh in the study area.

➢ **Transportation facility:** For transportation purpose auto, jeep and private bus services were available in the study area; however villagers reported that transportation facilities were not frequently available. Private vehicles like bicycles & motor cycles were also used by villagers for transportation purpose.Kirodimal, Railway Station – 14.2 km.

➢ **Medical facilities:** The Primary & secondary data reveals that there are only 01nos. of Sub Health Centers & 1 nos. of PHC's in the Study area. • During FGD villagers made various issues in health care facilities, such as health facilities available at PHCs, Laboratory testing and Delivery facilities at Government Health Centers, availability of clean toilet and drinking water at PHCs, and distance of the nearest health center from the Village. • To control the spread of diseases (Malaria & Dengue cases) and reduce the growing rates of mortality due to lack of adequate health facilities, special attention needs to be given to the health care in rural areas. The key challenges in the healthcare sector are low quality of care, poor accountability, lack of awareness, and limited access to facilities. • It is also observed that Malnutrition is the common in most of the villages.

➢ **Drinking water, sanitation & infrastructure**: It was observed that only 31 villages have Pucca Road facilities. It means nearly 75.60 % of the villages have road facility. It was observed that

there is good improvement in Power Supply. As the study area comprises of few Power Plants. This ultimately solved the Power cuts & Power Fluctuations in the villages of entire RaigarhDistrict. It is observed that the source of water for Drinking & Agriculture in most of the Villages is groundwater. And the remaining villages which are proximate to the River use that as source of drinking water & for Agriculture. It was observed that most of the Houses in the villages are not having sanitation facilities including in several schools. It was observed that now a day's Internet is playing major role in society, but in the study area only one Internet shop is available. Need to go to Raigarh.

➢ **Banking facility**: The study area has almost all the schedule commercial banks with ATM facility at urban areas and the district HQ.

➢ **Sports & social ailment issues:**

- Social ailment issues like child marriage, alcoholism among tribes.
- It is observed during FGD that there are only a few people got the benefit of Self-employment scheme and needs substantial improvement.
- It is observed that there is no encouragement for sports as there are less Schools & Colleges in the Study area. Raigarh is the only place where Sports training facilities are available in entire District.

3.8.1 Awareness and opinion of the respondents about the project

Public opinion is the aggregate of individual attitudes or beliefs. It is very important to take opinion of the villagers about the project. The awareness will not only promote community participation but also enable them to understand the importance of the project and encourage them to express there view. To know the awareness and opinion of the villagers about the project, group discussion, meeting with school teachers/village leaders were carried out in the study area.

➢ In nearby villages, majority of the respondents were aware about the project site both they were unaware about the project activity

➢ The respondents were happy to know about the project and they opined positively because the activity would definitely contribute development in the study area

➢ Village leaders asked to give employment opportunities to local people

➢ Main demands of villagers in study area were for medical facility and employment opportunity.

3.8.2 Interpretation

Socioeconomic survey was carried out to know the infrastructural activities amenities available within 10 km radius from Project Site. The information regarding facilities available and the opinion of the people was sought by floating questionnaires and interaction with the people. This is done for observing the impact due to the project wrt social aspects so that proper actions / measures could be taken up for the benefit of the people (economically and wrt quality of life) and the project.

During the primary survey it was observed that almost pakka road facility is available in all villages within 10 km radius. Literacy rate of the study region is from 62.04%. On the basis of survey for literacy rate data it is interpreted that there is need to promote educate more and more people. Almost all the villages have more than 53.22% people as non-workers. It indicates that the problem of unemployment can be solved by providing proper training and education. There is also need to establish more industries so that maximum number of employment can be generated. Basic

amenities like Education facilities Health care facilities, water supply, electric power supply, mode of transportation etc. are available in all villages.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Air Environment

The proposed expansion will have impact on the air quality parameters like PM_{10}, $PM_{2.5}$, SO_2, NO_X and CO. The raw material handling plant, IF's, steel melting shops will emit dust and fumes. Apart from the above, there will be fugitive dust emissions due to transportation, storage and processing of raw materials.

Although, the quantity of production will be increased but ground level concentrations will not be increased as the process of sponge and pig iron melting in induction furnace does not cause any SO_X emission, even the NOx formation is negligible it only emits some particulate matter with carbon loss gases exiting from top of induction furnace crucible. The existing emission limit of Particulate matter of 50 mg/NM^3will be reduced to 30 mg/NM^3. By use of better quality raw material carbon loss based flue gas generation will also get reduced. Hence it is inferred that considering cumulative concentration levels based on Air (ISCST3) Modeling Studies, the pollution load exerted due to proposed expansion project will be insignificant.

The mitigation measures adopted are:

- The primary & secondary emissions from the Induction furnaces, and continuous casting machine area will be extracted and treated in a fume extraction system.

- Adequate capacity dust extraction measures with swivel hood, ID fan shall be provided at different loading, unloading and transfer points in the raw material handling section.

- Fumes will be evacuated directly from induction furnaces through hoods with swiveling mechanism and ducting.

- The duct carrying fumes from Induction furnaces will join in a mixing chamber from where the gases will be led to the bag house by means of ID fan.

- To control Air Pollution industry had already installed Bag Filter with 30 meter chimney which will be upgraded by improvement in number of bags and ID/FD fan capacity to cater the future requirement i.e. to restrict emissions within the 30 mg/Nm^3 in place of prescribed limit of 50 mg/Nm^3

- Adequate dust suppression system in the form of water sprinklers shall be provided at raw material yard, temporary solid waste dump site and along the vehicular roads.

- There will be dedicated roads for vehicles carrying raw materials and products.

- Stacks are being already provided with porthole and working platform so that stack monitoring can be done as per norms of statutory authority.

Noise Environment:

During the normal operation of manufacturing process noise will be generated due to Induction Furnaces, ID Fan, Blower/air Fan, Cutting/Shearing Machine and DG Set, etc. the ambient noise levels are expected to increase significantly with the attributes of the respective equipment, but this noise will be restricted close to the concerned equipment. The preventive measures are given below:

- Equipment will be standard and equipped with silencer. The equipment will be in good working conditions, properly lubricated and maintained to keep noise within permissible limits.

- High noise zone will be marked and earplugs will be provided to the workmen near high noise producing equipment. The workmen will be made aware of noise and vibration impacts on their health and mandatory use earplugs.

- Proper shifting arrangement will be made to prevent over exposure to noise and vibration.

- Tall trees with heavy foliage shall be planted along the boundary of camp / project site / plantation area, which will act as a natural barrier to propagating noise.

- Silent DG sets shall be used at construction camp / project site.

- Speed limits shall be enforced on vehicle.

- Use of horns / sirens will be prohibited.

- Use of loud speakers will be complying with the regulations set forth by CPCB.

- Regular noise monitoring will be carried at construction camp / project site to check compliance with prevailing rules.

Water Environment:

The proposed expansionproject may have some impact on the water environment. The impact may be on the source of water in the form of depletion of water resources of the area and in the form of deterioration of quality of natural water resources due to discharge of plant effluent.

The various control measures that will be adopted are:

- No pre-treatment of raw water is required. As the water will be used for cooling purpose only.

- No wastewater generation from the process

- Closed circuit cooling system will be implemented.

- Water for Industrial Cooling will be extracted from ground water.

- Water requirement for domestic purposes fulfilled through ground water.

- Waste water generated through sanitary/toilet activities. This will be treated in STP and treated water will be used for plantation purposes and dust suppression.

- All stock piles will be on pucca flooring to prevent for any ground water contamination.

Vehicular Movement

All the major raw materials and finished products will be transported through trucks by road.

Biological Environment

There is no ecological sensitive area like national park, sanctuary, biosphere reserve, within 10 km radial distance from the project site. The project site located within the OP Jindal Industrial area, no forest land involved in the project activities. Thus, no significant impact envisaged on biological environment.

The total plot area is 2.76 Ha. M/s. MSAL already planted 68 nos. of different local and fast growing tree species. Existing plant species observed at project site is Moha, Neem, Maharukh, Peltophurum, BelNeem, Cassia, Mango, etc. Further, the total plantation will be covered within 35% of total plot area. Total 1455 nos. of sapling will be planted within 0.97 Hect. of land within plant premises.

Socio-economic Impacts:

The land use is not going to be significantly change as the proposed expansion will be carried out within existing plant premises, thus there will be no issue of involvement of any agriculture land or settlement on the contrary there will be positive impact on the socio economic environment of the area. Increase in direct/indirect job opportunity shall take place. Services in the locality shall be used and accordingly growth in economic structure of the area will take place.

5.0   ENVIRONMENTAL MONITORING PROGRAM

An Environmental Management Cell (EMC) will be established for the proposed expansion project under the control of Executive Director followed by General Manager.The EMC will be headed by an Environmental Manager having adequate qualification and experience in the field of environmental management.Environmental monitoring of ambient air quality, surface and ground water quality, ambient noise levels, etc. will be carried out through MoEF&CC accredited agencies regularly and reports will be submitted to CECB/MoEF&CC.

6.0   RISK ASSESSMENT & DISASTER MANAGEMENT PLAN

The assessment of risk in the proposed project has been estimated for fire, explosion and toxicity and corresponding mitigation measures are suggested in theEIA/EMP report.

A detailed Disaster Management Plan for facing disasters due to natural effects and human reasons is prepared and incorporated in the draftEIA/EMP report for ensuring safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of Disaster Management Plan, it will be widely circulated and personnel training through rehearsals. Site facilities, procedures, duties and responsibilities, communications, etc. are considered in details in the Disaster Management Plan.

7.0   PROJECT BENEFITS

Proposed Social Welfare Arrangement

The proposed project would provide development of area and consequent indirect and direct job opportunities which would finally result in improvement in the quality of life of people in the central region. M/s. MSAL will carry community welfare activities in the following areas:

- Community development
- Education
- Health& medical care
- Drainage and sanitation
- Roads

The project proponent will comply with its obligation for CSR as per Company's Act too.

As per O.M. dated 01/05/2018 issued by MoEF&CC, New Delhi proposals regarding Corporate Environment Responsibility (C.E.R.). The CER budget along with capital expanses with different heads are given below.

The proposed expansion cost of the project is Rs. 505 Lakhs. Thus, as per CER 1% i.e. 5 lakhs will be spent for the Improvement of Environment.

8.0   ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan comprising following set of mitigation, management, monitoring and institutional measures to be taken during implementation and operation of the project, to eliminate adverse environmental impacts or reduce them to acceptable levels.

- Overall conservation of environment.
- Minimization of natural resources and water.

- Ensure effective operation of all control measures.
- Monitoring of cumulative and longtime impacts.
- Ensure effective operation of all control measures.
- Control of waste generation and pollution.

Judicious use of the environmental management plan addressing the components of environment, which will be likely affected by the different operations in the project, will be implemented.The capital cost required to implement the EMP for proposed expansion is estimated tobe Rs40 Lakhs. The annual recurring expenses will be Rs.15Lakhs has been allocated for implementation of the Environmental Management Plan for proposed expansion project.

9.0   CONCLUSION

The proposed expansion of M/s. Mashiva Steel and Alloys LLPwill be beneficial for the overall development of the nearby villages. Some environmental aspects like dust emission, noise, wastewater, traffic density, etc. will continue to be controlled better than the permissible norms to avoid impacts on the surrounding environment. Necessary pollution control equipment like bag house, water sprinklers, enclosures, etc.form integral part of the plant infrastructure. Additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment and socio-economic environment of the area. Measures like development of green belt and plantation in nearby village and along transport road, adoption of rainwater harvesting/recharging in the plant and in nearby villages will be carried out. The proposed CSR activities to be initiated by the industry will be helpful to improve the social, economic and infrastructure availability status of the nearby villages.

Thus, it can be concluded that with the judicious and proper implementation of the pollution control and mitigation measures, the proposed expansion project will not add significant pollution level, it will be beneficial to the society and will help to reduce the demand-supply gap of steel to some extent and will contribute to the economic development of the region in particular and country in general.

10.0   DISCLOSURE OF CONSULTANTS

The Environmental studies for proposed project of M/s MSALare carried out by M/s Anacon Laboratories Pvt. Ltd., Nagpur (M/s ALPL). Anacon established in 1993 as an analytical testing laboratory and now a leading Environmental Consultancy firm backed by testing lab for environment and food in Central India region. M/s ALPL is a group of experienced former Scientists from the Government Institutions and excellent young scientist of brilliant career with subject expertise. It is recognized by Ministry of Environment & Forests, New Delhi for carrying out environmental Studies& accredited by Quality Council of India (QCI) for conducting Environmental studies as per QCI-NABET SA – 241th AC Meeting, dtd. Jan4, 2019.