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EXECUTIVE SUMMARY

Introduction

M/s Om Sairam Steel and Alloys Pvt. Ltd. is a large Scale Industry, in secondary metallurgical sector. As per EIA Notification No. S. O. 1533 promulgated on 14th September 2006 had covered this type of industries under entry 3(a) and category “A”. It proposes to enhance its production activity to produce sponge Iron 1000 TDP, billets/ingots 472 TPD and power generation 50 MW at Plot no. F-1, 2, 3, 8,9,10, ADD. MIDC, phase – II and Adjacent Gut No.46 &63 Daregaon, Jalna , Maharashtra

Industry has a MIDC plot of ~06.44ha (about 64434 m²) with the connected power

The plot utilization is as under:

- Plot size 64,434 m²
- Existing construction 14,400 m²
- Proposed Construction 12,600 m²
- Green Belt 4,450 m²
- Parking area 3,500 m²
- Open area 14,000 m²
- Ground Coverage 18,000 m²

Project details:

M/s Om Sairam Steel and Alloys Pvt. Ltd; has propose to involve in manufacturing sponge iron by using 500x2 DRI Kiln & raw material as iron ore and coal, Power generation from waste heat recovery, coal and dolochar, M S Billet/Ingot using Induction furnaces. The greatest advantage of the Induction Furnace is its low capital cost compared with other types of Melting Units. Its installation is relatively easier and its operation simpler. Among other advantages, there is very little heat loss from the furnace as the bath is constantly covered and there is practically no noise during its operation. However, we propose to install two new induction furnace of capacity 30 T. Hence, total 4 Nos. of induction furnace having capacity 30T. This will result in reduction in energy consumption and waste generation per ton of product. The future raw materials requirement is given in Table 1:

Table 1: Raw Materials

Raw Material / ton of the product		
Name	Quantity ton	Connectivity
DRI (Sponge Iron)		
Iron Ore Pellet/Lumps	1400 TPD	Ensured
Coal	1200 TPD	Ensured
Dolomite	30TPD	Ensured
For Power Plant		
Dolochar	312 TPD	Captive
Coal	468 TPD	Ensured

Waste Heat	104TPH	Captive
For Billet/Ingot		
MS Scrap	100TPD	Available
Sponge Iron	920TPD	Captive
Pig Iron	100TPD	Chandrapur
For Rolling mill		
Billets	1015TPD	Captive

Process

Sponge Iron:

- This process utilizes non-coking coal as reducing agent along with lumpy rich grade iron ore.
- The reduction is carried out in an inclined horizontal rotary kiln, which rotates at a predetermined speed. A temperature profile ranging from 800-1050 degree centigrade is maintained along the length of the kiln at different zones and as the material flows down due to gravity the ore is reduced.
- The hot reduced sponge iron along with semi-burnt coal, discharged from kiln is cooled in water-cooled cylindrical rotary cooler to a temperature of 100–200 degree centigrade.
- The discharge from cooler consisting of sponge iron, char other contaminations are passed on through magnetic separators so that sponge iron can be separated from other impurities.

Billets & Ingots:

Raw material, basically sponge iron & iron scrap, is charged from the top of the furnace. Once charged to the capacity, the furnace is switched on. High current flows at a comparatively low voltage through the induction coils of the furnace, producing an induced magnetic field inside the central space of the coils where the crucible is located. The induced magnetic flux heats the scrap resulting in melting. The molten metal is circulated automatically by electromagnetic action so that when additions are made, a homogeneous product is ensured in minimum time.

This hot billet will be transferred to the rolling mill, and rolled in various sizes.

Steel production using Induction furnace is basically low pollution process as no fuel, except electricity, is used in the process.

Pollution Control -- Water and Wastewater

Water Quality:

Raw Water: The water used for this plant is already available, assured and dependable, treated fully in MIDC Water Works and the quality is acceptable for use as cooling water and boiler blow down. However, for expansion project it is planned to have water treatment plant.

Water Balance

Water is mainly required domestic and as cooling towers and boiler blow down spraying and gardening purposes. Process does not need water. Landscaping uses the recycled waste water.

Table 2 shows water balance:

Table 2: Water budget

Sr. No.	Unit	Water requirement in KLD	Waste Water Generation in KLD	Disposal
1	Domestic	25	20	Sewage Treatment Plant
2	Boiler & Cooling	1100	35	Sober
3	Green Belt	25	--	--
	Total	1150	55	

Only domestic & Boiler/cooling wastewater is generated in the project and domestic wastewater shall be treated in Sewage Treatment Plant, boiler/cooling wastewater will be treated by PCT. Overflow will be reused for landscaping after disinfection.

Mitigation:

As mitigation measures, it is proposed to take-up following:

- To spread awareness to the workers about the importance of water quantity measurements and resource conservation.
- Shop-floor supervisors are encouraged for mopping up, dry collection and good house-keeping by arranging lectures, and by conscious supervision.
- The treated domestic waste water will be applied judiciously on land for gardening so that there will not be any flooding of excess water either to migrate to ground water table or get away as runoff to join surface water drains.

3.2 Pollution Control -- Air:

Emissions are mainly from coal fired boiler, Kiln, furnace and ladle in the form of SPM and fumes. The Dust and fume will be extracted by Fume extraction system with cyclone for collecting particulate matter followed by ESP, Bag Filter and Wet scrubber with proper stack of 42 & 80 m height, 1.3m dia will be provided and discharged to the atmosphere

The air pollution control system shall have:

- Fume extraction system
- Duct from hood to cyclone
- Wet Scrubber, two numbers, Height 1.5 m x Length 1.2 m x Breadth 1.2 m
- stack of 42 m height, 1.3m dia & 80m height 2.0m dia
- The MS stack is proposed fitted with port-holes, ladder and platform for facility of taking samples

Fugitive:

Fugitive emission will be controlled by:

- Regular water sprinkling
- Rubber wheel carts / trolleys for material handling
- Adopt layout to minimize manual material movement
- Tree plantation on surrounding area

Prediction of impacts on air environment has been carried out employing, Industrial Source Complex-Short Term [ISCST3] 1993 dispersion model based on steady state Gaussian plume dispersion, designed for multiple point sources for short term and developed by United States Environmental Protection Agency [USEPA].

The predicted results with baseline concentrations for Particulate matter are $5.07 \mu\text{g}/\text{m}^3$ at 1 km towards East direction.

Solid Waste

The solid waste produced by the induction furnace is slag about 170 TPD. It is proposed to dispose by as building material, brick manufacturer, road construction and filling low lying area with the plot boundary. There is production of Dolochar which will be used FBC Boiler as fuel, refractory as well and Ash from the process which will be sold to brick manufacturing. In addition, office waste generated shall be disposed to municipal disposal ground. Used oil drums shall be disposed to authorized recyclers.

Quantification in of the waste for the unit can be presented as follows:

(A) Non Hazardous Solid Waste:**Table No. 3: Solid Waste per Day**

#	Waste	Qty	Treatment	Disposal	Remark
1	STP	5 Kg/day	Treated	Own garden	Organic, Non-Haz
2	Office		--	Sales	Non-Haz.
3	Process	12MTM	Refractory	Sales	Inert and Non-Haz.
		312MTD	Dolochar	Reuse	Will be used FBC Boiler as fuel
		118MTD	Ash	Sale	for brick manufacturing
4	Slag	170MTD	Segregation	Sale	for brick manufacturing, road making and building construction

(b) Hazardous Waste:

Empty oil drum shall be sold to recyclers.

Risk Assessment

Steel manufacturing from sponge iron and scrap in this case, is a simple three step process i.e. charging, melting and tapping. However Risk is posed by dust emission in various operational steps. Adequate dust control measures have been incorporated to minimize this risk.

In addition, general safety measures proposed are:

- Limiting the vehicles speed within the premises to 15 km/hr.
- Other raw materials are brought in closed containers to minimize dust generation. If sundry raw material comes in bags, hooks and other sharp equipment is not to be used on bags or unit loads. Cranes, tackles and forklift trucks are used for unloading and loading.
- Before storage all units are to be inspected for cleanliness and for damage.
- All bags are to be stacked on pallets. All damaged bags are to be repaired a second impermeable bag which would be sealed properly and kept separately for use.
- Dyke walls, smooth sloping floors provided around storage tanks.
- Use of PPE is mandatory for all floor personnel

Disaster Management Plan and off-site emergency plan will be in place. Consulting Physician is available in case of emergency.

Conclusion

This industry will manufacture steel parts which are in good demand for growing infra-structural facilities in India. The expansion will not disturb the present land use as the area falls in MIDC.

- This is integrated steel plant with self generation of power.
- This project will add to the waste reuse i.e. wealth from waste.
- Provide employment opportunity to local skilled semiskilled and unskilled man power
- Will improve socio-economic condition of the area
- Minimal air pollution and water pollution
- Adequate safety built in
- A zero discharge unit.
- Green belt development
- A small step towards Sustainable Development.

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CHAPTER 1 – INTRODUCTION

1.1 Introduction

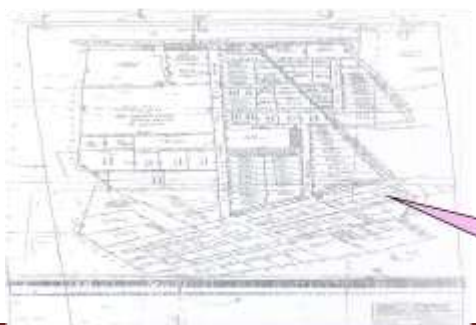
M/s Om Sairam Steel and Alloys Pvt. Ltd. is a large Scale Industry, in secondary metallurgical sector. It proposes to enhance its production capacity to produce sponge Iron 1000 TDP billets/ingots 472 TPD and power generation 50 MW at Plot no. F-1, 2, 3, 8,9,10, ADD. MIDC, phase – II and Adjacent Gut No.46 &63 Daregaon, Jalna, Maharashtra

1.2 Size Location and Nature of the project

Industry occupies a MIDC plot of about 06.44ha (about 64434 m²) of the total plot area, approx 64,434 m² is occupied by induction furnace shed, transformer, laboratory, caster, rolling mill shade and other facilities. It is planned to have 4450-m² for green belt development.

- Plot size 64,434 m²
- Existing construction 14,400 m²
- Proposed Construction 12,600 m²
- Green Belt 4,450 m²
- Parking area 3,500 m²
- Open area 14,000 m²
- Ground Coverage 18,000 m²

The plant is accessible by all-weather road. The MIDC layout in Jalna is shown below.



Project: M/s Om Sairam Steel and Alloys Pvt.Ltd;

CHAPTER 2 - PROJECT DESCRIPTION

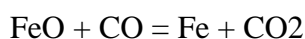
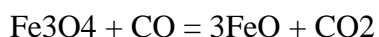
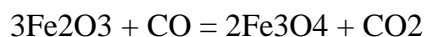
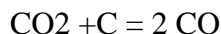
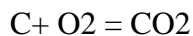
2.1 Process

Major DRI production processes are either gas based or coal based. Feed material in a DRI process is either iron ore sized to 10 to 30mm or iron ore pellets produced in an iron ore pellet plant.

In the gas based plant the reactor, the reduction reaction takes place is a shaft furnace. The shaft furnace works on counter current principle where the iron ore feed material moves downward in the furnace by gravity and gets reduced by the up flowing reducing gases. The pressure and temperature in shaft furnace in HYL process is 5-6 bars and 800-850 deg C. The same in Midrex process is 1-1.5 bar and 800-850 deg. C.

In a coal based plant the reactor for the reduction reaction is a inclined horizontal rotary kiln. In this kiln both coal and the iron ore feed material is charged from the same end of the kiln. During the movement of feed material forward the oxidation reaction of carbon in coal and reduction reaction of CO gas is carefully balanced. A temperature profile ranging from 800-1050 deg C is maintained along the length of the kiln at different zones and as the material flows down due to gravity the ore is reduced

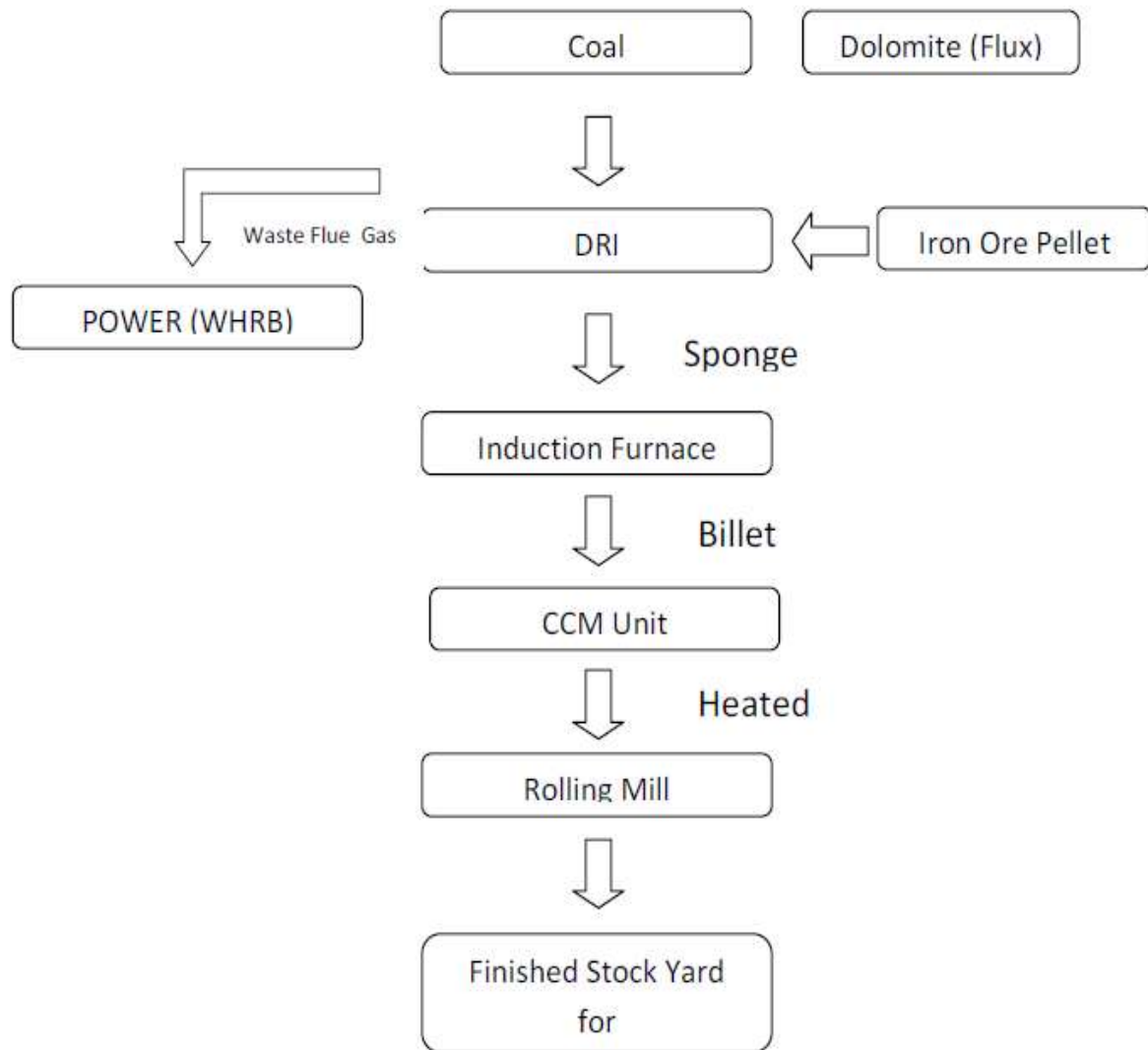
The basic reduction reactions in a coal based DRI process is as follows



In the coal based process the hot reduced DRI along with the semi burnt coal is cooled in water cooled cylindrical rotary cooler to a temperature of 100 to 200 deg C. The cooler discharge consisting of DRI, char and other contaminants is passed through magnetic separators for separating DRI from other impurities.

Secondary steel making units use assorted mild steel scrap, cast iron and sponge iron as raw materials. These are charged from the top in Induction furnace. Molten steel is poured in ladle, where necessary treatment to adjust the quality is carried out. The ladle is taken to the billet caster for casting billets. These hot billets are transferred to the rolling mill for rolled to round or desired products.

We propose to use four induction furnace of 30 ton capacity. This will result in reduction in energy consumption and waste generation per ton of product. The block diagram of the manufacturing process is as under:



*QST – Quenching and Self Tempering

Figure No. 2.1: Process Flow Chart

Table No. 2.1 Project Details

#	DETAILS	PARTICULARS
1	Type of project	Metallurgical & Power Generation
2	Production TPD, MW	Sponge iron 1000, Power Generation 50 MW , Billets 1000, TMT Bar 1000
3	Plot area m ²	64,434
4	Electricity	MSEDCL and self Generation
5	Fuel	Waste heat, Coal, Electricity

6	Induction furnaces	30 tones x 2 Nos. existing & 30 T X2 additional
7	DG Sets	500 kVA x 2 Nos. each
8	Water use KLD	1150 from MIDC
9	Waste water KLD	Domestic 20
10	ECE	3No. ESPs and 80 M stack, 2Nos. Ventury scrubber & 42 M stack
11	Employees	400 + 40
12	Cost	Rs 510.00 Crs.
13	Pollution control equipment Cost	Rs 13.00 Crs. (additional)

Figure 2.2: Layout of Proposed Activities

Raw Materials:

The raw materials for this industry are mainly MS Scrap and other materials like Sponge Iron, Coal, Dolochar, Pig iron etc. Table 2.2 describes the raw materials requirement:

Table No.2.2 Raw Materials

S no.	Process	Raw Material	Quantity	Logistics
1	Sponge Iron	Iron Ore Pellet	1450 TPD	By road
		Coal B Grade	1200 TPD	
		Dolomite	30 TPD	
2	Power Plant (FBC Boiler 24MW & WHR 26MW)	Dolochar	312 TPD	By road
		Coal	468 TPD	
		Flue Gas from DRI Kiln	104 TPH	
3	Billets	Sponge Iron	920 TPD	By road
		Scrap	100 TPD	
		Pig Iron	100 TPD	
4	Rolling Mills	Ingots/Billets	1015 TPD	By Road

Utilities

Power: Power required for this project is 42MW, and this will be self generated.

DG Set: Standby of 2*500 KVA

Water: The water requirement is about 1150 m³/d for domestic, greenery, and quenching and cooling and will be supplied by MIDC. A water treatment plant has been planned with settling, coagulation and disinfection during expansion phase.

Sewage generation:

- **Total sewage generation will be 20m³/day will.**
- Will be treated in Extended Aeration System STP of capacity 20 m³ which includes tertiary treatment as well.
- The treated wastewater shall be reused for gardening resulting in zero discharge from the proposed activity.
- Process of STP as follows,

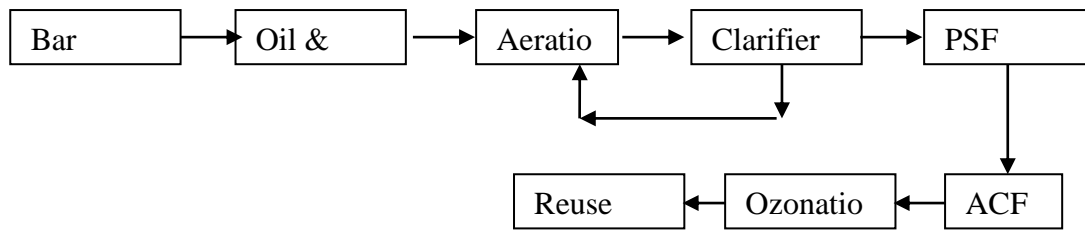


Fig: Extended Aeration System

- Design Parameters are as follows;

DESIGN PARAMETER	INLET VALUE	OUTLET VALUE
pH	6.5-8.5	7-8
BOD ₅	250-300 mg/lit	≤30
COD	350-450 mg/lit	≤250
Suspended Solids	200-300 mg/lit	≤100
Oil & Grease	10-15 mg/lit	≤10

- The treated wastewater shall be reused for gardening resulting in zero discharge from the proposed activity
- Waste water generate from boiler/cooling will be reused for gardening after PCT

Total solid waste generation will be 110 kg/day

Dry garbage: 77 kg/day will be handed over to authorized contractor of MIDC.

Wet garbage: 33 kg/day will compost and manure will used as manure for landscaping.

Manpower: The manpower requirement is 440 for administration and production purposes will be recruited locally.

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CHAPTER 3 – BASELINE ENVIRONMENTAL STATUS

3.1 Introduction:

This chapter describes the existing environmental status of the study area with reference to air, water, soil, meteorology, climate, hydro-geological, ecology and socio-economic profile of people in the study area. Primary data (air, water, soil and noise) was collected during winter season: **October-2014 to December 2014** and the secondary data was collected for other attributes like ecology, socio-economics, etc.

3.2 Air Quality

Six ambient air quality monitoring stations were established in the study zone of 10 km radius around the project site as shown in **Figure 3.1**. The location of stations and its distance from site are presented in Table 3.1. The main sources of air pollution in the region are small scale industries and traffic.

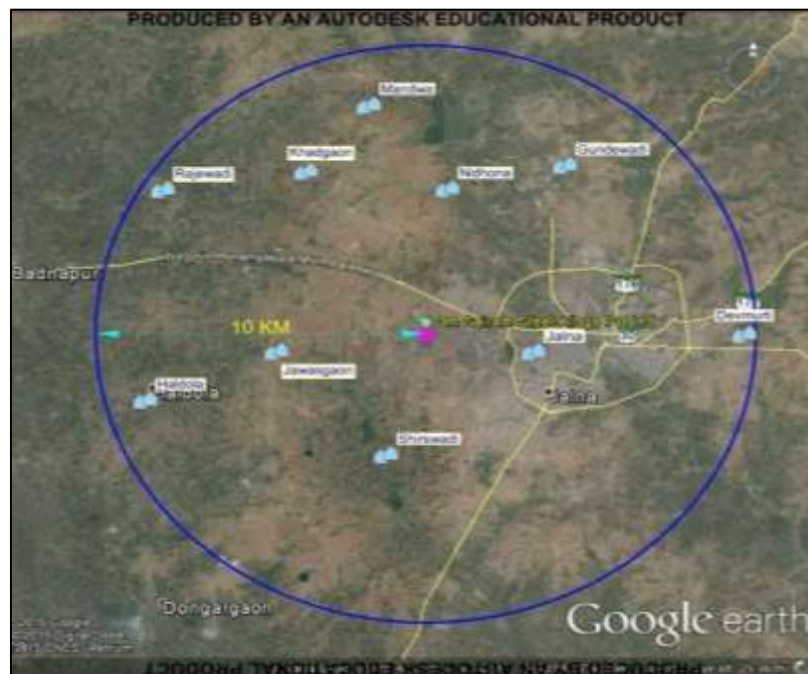


Fig 3.1: Air monitoring stations

Table 3.1 Location of AAQ stations

Sr. No.	Locations Air/ Noise/ Soil	Distance (km)	Direction
1	Project site	--	--
2	Haldola	8.15	SW
3	Mandwa	7.90	N
4	Jalna	4.00	E
5	Gundewadi	7.30	NE
6	Sirswadi	4.30	S
7	Nidhona	4.70	N
8	Khadgaon	6.50	NW
9	Jawasgaon	4.65	W

10	Deomurti	10.00	E
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Selection of sampling Locations

The location of the station was selected on following considerations:

- Predominant wind direction as per IMD data
- Sensitivity of the area, if applicable

Monitoring was done for PM_{2.5}, PM₁₀, SO₂, NO_x. The frequency of monitoring is mentioned in Table 3.2 and results of monitoring are presented in Table 3.3.

Table 3.2 Parameters and Frequency of monitoring during Oct. – Dec. 14

Parameters	Sampling Frequency
PM _{2.5} , PM ₁₀ SO ₂ and NO _x	24 hourly, twice a week
(CO)	8 hourly, six sample/station

Table 3.3 Results for Location of AAQ stations

Parameter		AAQ 1	AAQ 2	AAQ 3	AAQ 4	AAQ 5	AAQ 6	AAQ 7	AAQ 8	AAQ 9	AAQ 10
PM _{2.5} µg/m ³	Max.	31.65	27.41	25.48	27.84	27.49	24.58	25.98	25.50	26.54	24.79
	Min	21.57	19.68	18.38	19.84	20.63	14.19	19.65	17.59	17.98	18.97
	Avg	26.70	23.38	22.98	23.66	23.63	20.06	23.61	22.00	21.39	21.64
PM ₁₀ µg/m ³	Max	81.23	71.34	74.29	74.55	74.18	70.21	74.68	71.24	73.28	74.29
	Min	60.28	61.84	62.39	63.69	62.38	59.63	62.47	57.42	20.64	22.47
	Avg	68.79	66.44	68.18	69.51	69.48	64.04	68.73	66.72	64.38	64.85
SO ₂ µg/m ³	Max	15.21	20.19	23.98	23.65	24.18	19.86	24.19	22.38	25.87	21.49
	Min	10.86	12.82	13.68	13.28	12.48	12.34	13.28	11.95	12.88	11.96
	Avg	12.58	16.71	17.70	18.50	18.50	15.41	18.97	17.03	17.18	15.37
NO _x µg/m ³	Max	22.19	24.89	29.63	28.55	29.63	24.78	29.72	26.42	29.87	30.83
	Min	16.37	17.84	18.96	17.45	18.37	17.92	18.79	16.39	17.04	17.30
	Avg	19.22	21.57	22.78	23.50	23.41	21.06	24.05	21.69	22.04	20.95

The full sets of monitoring results for winter season are presented in **Annexure 1. (Annexure-I- All Baseline Results- Air, Soil, Noise & Water)**

Discussions

It could be noticed from the results, the air quality of the study area is within NAAQS November 2009, in µg/m³

The maximum and minimum PM_{2.5} in the study area was recorded at 26.70 µg/m³ and 21.39µg/m³ respectively. The maximum concentration was recorded at project site and the minimum at Jawasgaon

The PM₁₀ maximum and minimum were recorded at 69.51 µg/m³ and 64.04µg/m³ respectively in the study area with maximum at Jalna and minimum at Siraswadi

The SO₂ maximum and minimum were recorded at 18.50 µg/m³ and 12.58 µg/m³ respectively in the study area with maximum at Jalna & Gundewadi and minimum at Project site

The NO_x maximum and minimum were recorded at 24.05µg/m³ and 19.22 µg/m³ respectively in the study area with maximum at Nidhona and minimum at Project site.

3.3 Water Environment

Selected water quality parameters for surface and ground water resources were studied within 10 km radius for assessing the water environment. The location of the SW sampling stations is presented in **Figure 3.2** and the distance from the Project site is given in **Table 3.4**. The results are summarized and presented in **Table 3.5**



Fig 3.3: Location of Surface water Stations

Table 3.4 Surface Water stations

Station	Location	Direction	Distance km
1	Moti Talav	E	2.5
2	Ghanewadi Dam	N	6.5

Two surface water sources were selected for collecting water samples within the study area

Table 3.5a Surface Water Quality Results

Sr. No.	Parameter	MotiTalav SW1	Ghanewadi Dam (SW2)	Limits IS-10500:2012	Units
---------	-----------	---------------	---------------------	----------------------	-------

1.	Colour	3.1	4.1	5	Hazen
2.	pH	7.42	7.38	6.5-8.5	--
3.	Conductivity	498	4.85	--	µmhos/cm
4.	DO	2.3	1.5	--	mg/l
5.	COD	10.86	6.98	--	mg/l
6.	BOD (3 days at 27°C)	4.8	3.4	--	mg/l
7.	TDS	518	518	500	mg/l
8.	Chlorides (as Cl)	124	111	250	mg/l
9.	Free Ammonia	0.3	0.1	--	mg/l
10.	Total Hardness (as	421	392	200	mg/l
11.	Calcium (as Ca ⁺⁺)	078	0.68	75	mg/l
12.	Magnesium as(Mg ⁺⁺)	2.83	2.83	30	mg/l
13.	Sodium (as Na)	62	48	--	mg/l
14.	Potassium (as K)	24	18	--	mg/l
15.	Sulphate (as SO ₄)	21	15	200	mg/l
16.	Nitrate (as NO ₃)	3.2	2.7	45	mg/l
17.	Fluoride (as F)	BDL	BDL	1.0	mg/l
18.	Copper (as Cu)	BDL	BDL	0.05	mg/l
19.	Iron(as Fe)	BDL	BDL	0.3	mg/l
20.	Zinc (as Zn)	BDL	BDL	5	mg/l
21.	Boron (as B)	BDL	BDL	0.5	mg/l
22.	Arsenic (as As)	BDL	BDL	--	mg/l
23.	Lead (as Pb)	BDL	BDL	0.01	mg/l
24.	Pesticides	Absent	Absent	Absent	--
25.	Total Coliform	400	327	0	MPN/100ml

Discussion

Surface water samples analyzed during the study period indicate that the water is free from various metals and industrial pollution such as fluoride, copper, iron, zinc, boron, arsenic and lead. These elements are found to be below detectable levels in the analyzed water samples. However, both surface water samples showed presence of coliform bacteria making it unfit for drinking purposes. This also indicates contamination of faecal matter into the waterbody. All the other parameters are found within the prescribed limits

Ground Water Sampling Locations:

Water samples were collected from bore/open wells located within 10 Km. radius. The location of the monitoring stations is presented in **Figure 3.3** and **Table 3.6**. The region receives limited rains (water shortage area), but has considerable groundwater presence. The quality of groundwater is examined by drawing samples from open dug wells as well as from deep wells from the study area. Analysis was done by Standard Methods. The results are summarized and presented in **Table 3.7**:



Fig 3.3: Location of Groundwater Stations

Table 3.6 Location of Ground water stations

Station	Location	Direction	Distance km
1	Project site	--	
2	Dawalwadi	W	5.10
3	Jalna	SE	3.8

Table 3.7 Ground Water Quality Results

Sr. No.	Parameter	Project site (GW1)	Dhawalwadi (GW2)	Jalna (GW3)	STANDARD IS - 10500:2012	Units
1.	Colour	1.0	1.0	1.0	5	Hazen
2.	pH	26	25	26	6.5-8.5	--
3.	Conductivity	6.73	7.00	7.36	--	µmhos/cm
4.	DO	4.10	3.98	4.23	--	
5.	Residual Chlorine	Nil	Nil	Nil	0.2	mg/l
6.	TDS	120	92	103	500	mg/l
7.	Chlorides (as Cl)	56	38	47	250	mg/l
8.	Alkalinity	68	42	57	200	mg/l
9.	Total Hardness (as CaCO ₃)	139	124	99	200	mg/l
10.	Sodium (as Na)	110	88	56	--	mg/l
11.	Potassium (as K) ₂	0.06	0.04	0.03	--	mg/l
12.	Sulphate (as SO ₄)	41	26	35	200	mg/l
13.	Nitrate (as NO ₃)	15	20	17	45	mg/l
14.	Fluoride (as F)	0.2	0.13	0.2	1.0	mg/l
15.	Copper (as Cu)	0.07	0.04	0.02	0.05	mg/l
16.	Iron (as Fe)	0.15	BDL	0.09	0.3	mg/l

17.	Zinc (as Zn)	1.5	0.5	1.3	5	mg/l
18.	Boron (as B)	BDL	BDL	BDL	0.5	mg/l
19.	Lead (as Pb)	BDL	BDL	BDL	0.01	mg/l
20.	Total Coliform	Absent	Absent	Absent	0	MPN/100 ml

Discussion

Ground water samples analyzed during the study period indicate that the metals like copper, iron, zinc, lead etc. are within limits. Coliform bacteria are also absent in the analysed samples. Total dissolved solids and hardness are also within the IS 10500:2012 limits.

3.4 Soil

The soil in and around the proposed site is formed due to weathering of rocks and can be classified as reddish gray / brown silky type. Rocks underneath are of volcanic origin. The rocks are dark colored of basaltic composition and mainly comprise of plagioclase, pyroxenes iron ores, primary glass and some secondary minerals. The location of the sampling stations is marked in **Figure 3.4**. The names and the distance from Project are presented in **Table 3.8**. The results of soil analysis are presented in **Table 3.9**.

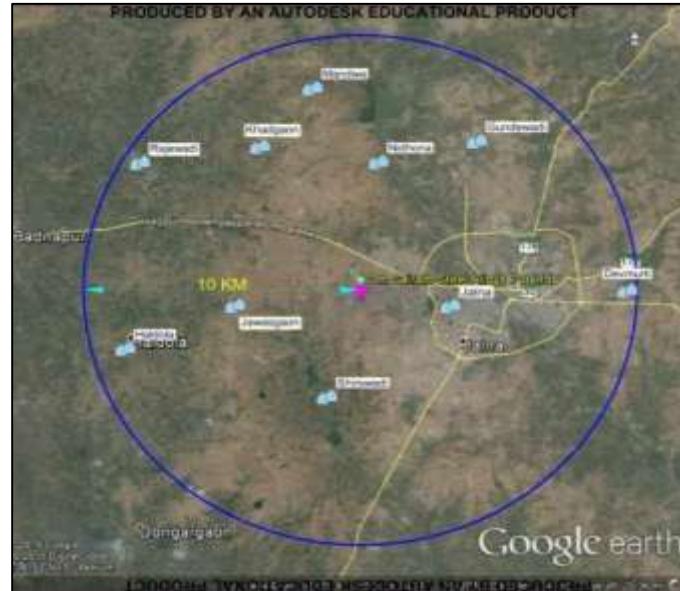


Figure 3.4: Soil sampling locations

Table 3.8 Soil sample Stations

Sr. No.	Locations Air/ Noise/ Soil	Distance (km)	Direction
1	Project site	--	--
2	Haldola	8.15	SW
3	Mandwa	7.90	N

4	Jalna	4.00	E
5	Gundewadi	7.30	NE
6	Sirswadi	4.30	S
7	Nidhona	4.70	N
8	Khadgaon	6.50	NW
9	Jawasgaon	4.65	W
10	Deomurti	10.00	E

Table 3.9 Soil sample Stations

S. No.	Parameter	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	Unit
1	Colour	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	--
2	Conductivity	0.064	0.086	0.078	0.096	0.083	0.094	0.082	0.079	0.074	0.083	Ms/cm
3	pH (1:5 Susp)	7.68	8.13	7.98	7.45	7.38	7.77	7.74	7.84	7.63	7.71	pH Scal
4	Moisture Con	3.12	2.48	2.74	1.98	1.38	2.05	1.83	1.84	1.73	1.89	%
5	Water Holding Capacity	62.33	23.78	19.56	17.95	18.86	11.34	15.94	17.34	16.38	11.67	%
6	Organic Matt	0.042	0.099	0.078	0.067	0.071	0.069	0.071	0.076	0.073	0.077	mg/kg
7	Total Kjeldah Nitrogen (as N)	284	402	381	378	329	285	332	312	298	274	mg/kg
8	Chloride (as Cl)	138.94	114	104	97	92	78	78	80	83	84	mg/kg
9	Sulphate (as S)	172.34	138	127	158	115	271	205	209	268	268	mg/kg
10	Phosphate(as P)	84	73	64	61	66	54	64	44	38	45	mg/kg
11	Calcium (as Ca)	98	95	87	84	89	75	83	87	91	94	mg/kg
12	Magnesium (as Mg)	17.36	23.55	17.92	15.68	14.92	15.63	12.68	11.96	11.26	12.98	mg/kg
13	Sodium (as Na)	543	397	3.84	294	365	387	386	374	374	374	mg/kg
14	Potassium (as K)	228	207	198	192	190	188	202	174	169	173	mg/kg
15	Iron	40	38	32	29	28	18.95	21.56	17.55	15.94	14.38	mg/kg
16	Copper (as Cu)	56	29	21	20	28.45	19.62	28.92	20.95	18.55	15.94	mg/kg
17	Chromium (as Cr)	34	22	17	14	12	9.56	13.55	14.68	9.63	9.64	mg/kg
18	Cobalt	0.03	0.02	0.03	0.02	0.03	0.09	0.05	0.06	0.05	0.06	mg/kg
19	Cadmium (as Cd)	0.5	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.3	0.3	mg/kg
20	Zinc (as Zn)	14	14	15	17	18	13.68	14.63	13.68	13.68	11.68	mg/kg
21	Lead(as Pb)	2.52	2.52	3.05	3.19	3.33	2.53	2.14	3.24	3.11	2.84	mg/kg
22	Mercury (as Hg)	20.34	17.43	13.62	14.08	15.69	17.23	18.36	19.83	20.38	19.85	mg/kg
23	Nickel (as Ni)	21.56	20.58	17.42	18.92	19.63	15.29	17.54	15.87	17.45	17.56	mg/kg
24	Boron	45.63	43.23	43.26	45.23	44.15	18.42	42.38	39.52	21.67	14.68	mg/kg

3.5 Noise

3.5.1 Noise Levels

The noise levels measured at the existing plant facility, proposed project site and villages located within study area. The location of the stations is presented in **Figure 3.5**. The station details are given **Table 3.10** whereas results of monitoring are presented in **Table 3.11**

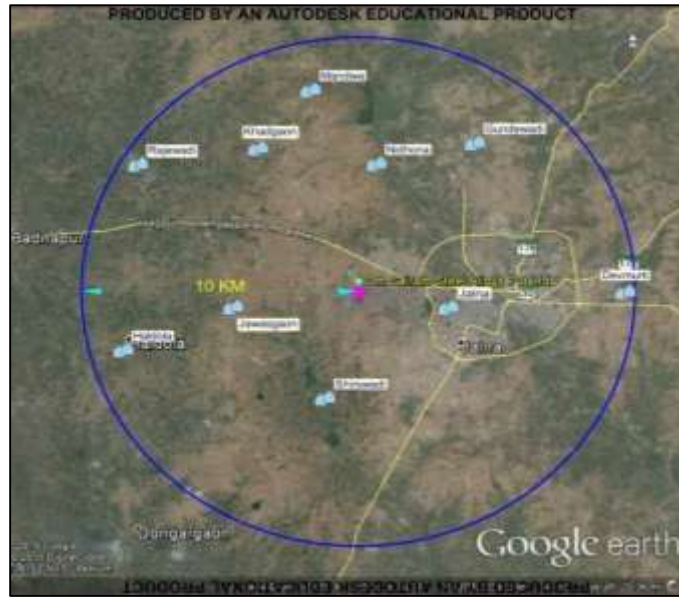


Figure 3.5: Noise sampling locations

Table 3.10 Noise sample Stations

Sr. No.	Locations Air/ Noise/ Soil	Distance (km)	Direction
1	Project site	--	--
2	Haldola	8.15	SW
3	Mandwa	7.90	N
4	Jalna	4.00	E
5	Gundewadi	7.30	NE
6	Sirswadi	4.30	S
7	Nidhona	4.70	N
8	Khadgaon	6.50	NW
9	Jawasgaon	4.65	W
10	Deomurtti	10.00	E

Table 3.11 Noise monitoring observations

#	Station	Month 1		Month 2		Month 3	
		Day	Night	Day	Night	Day	Night
1.	Project site	52.2	48.4	49.8	44.2	49.2	45.8
2.	Haldola	53.7	45.2	52.4	46.7.	50.6	44.8
3.	Mandwa	51.8	45.8	50.2	47.9	49.6	46.3
4.	Jalna	52.3	43.8	51.8	45.9	50.8	44.3
5.	Gundewadi	53.8	44.5	52.6	43.8	51.7	45.3
6	Siraswadi	52.8	45.2	50.7	44.3	51.3	44.2
7	Nidhona	51.8	44.6	50.3	45.29	49.5	43.2
8	Khadgaon	50.3	45.8	51.4	48.59	50.6	44.9
9	Jawasgaon	51.4	46.7	52.6	47.59	53.8	48.3
10	Deomurtti	52.4	47.5	53.6	48.9	51.7	46.7

AMBIENT NOISE LEVEL STATNDARDS

Category of Area	Limits in dB (A) Leq	
	Day Time (6.00 am to 10.00 pm)	Night Time (10.00 pm to 6.00 am)
Industrial Area	75	70
Commercial Area	65	55
Residential Area	55	45
Silence Zone	50	40

Inference: Noise levels are within prescribed limit.

3.6 Land use Studies

Satellite Data: **RESOURCESAT-2** cloud free data has been used for Land use / land cover analysis.

PC based GIS and image processing software's are used for the purpose of image classification and for delineating drainage and other features in the study area. Number of peripheral devices such as scanner, plotter, printer etc. has also been interfaced with the system.

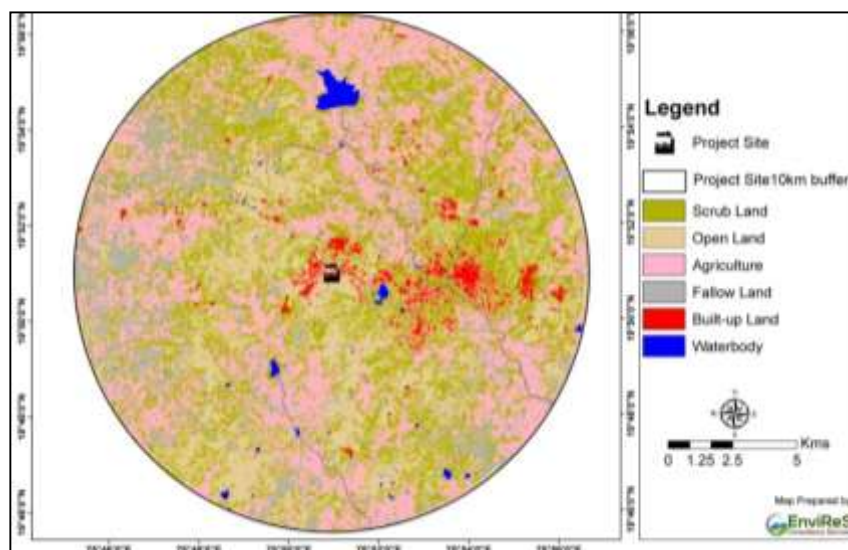


Fig.3.6 Land use/land cover map of study area

Land use/Land cover Classification System

The present Land use/Land cover maps were prepared based on the classification system of National standards. Break up of land use is given in Table-3.12

The relevant statistics of this subject is as given below;

Table No. 3.12 : Land Use details for 10km study area

Sr. No.	Description	Area(ha)	sq km	%
1	Scrub land	9880.0425	98.80043	31.42629
2	Open Land	7447.815	74.47815	23.6899
3	Agriculture	9870.6825	98.70683	31.39652
4	Fallow Land	3064.815	30.64815	9.748518
5	Built-Up Land	851.175	8.51175	2.707405
6	Waterbody	324.2475	3.242475	1.031362
	Total Area	31438.7775	314.3878	100

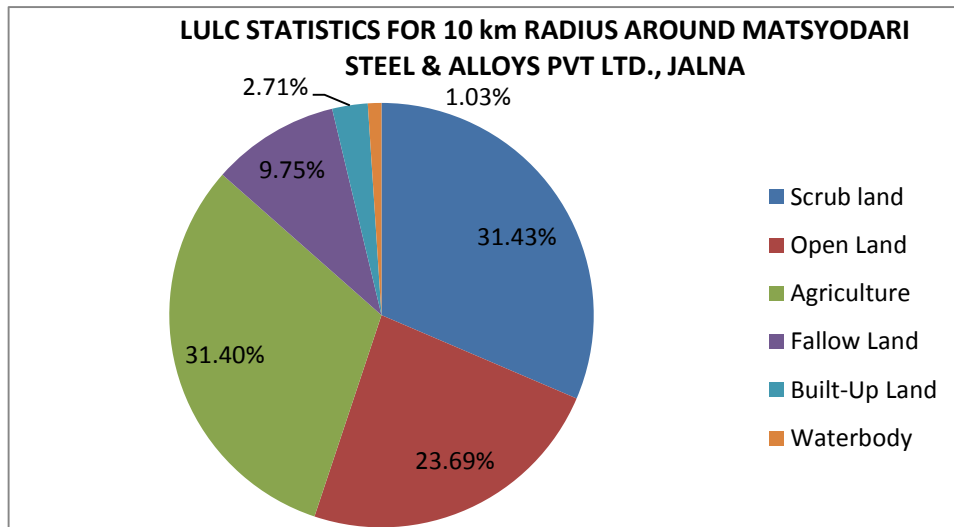


Figure: LULC for 10 km study area

3.6.1 Topography

The district has moderately to gently sloping undulated topography. The Northern part of the district is occupied by Ajanta and satmala hill ranges. The 95 % area of the district falls in the Godavari basin. The river Godavari flows along the Southern boundary from West to East direction. The rivers Dudhana, Gulati, Purna are the principal tributaries of river Godavari, which flow through the district.

The major part of the district falls in the Purna sub basin. The river Purna flows from the central part of the district and meets river Godavari in the neighboring district. The river Khelna, and Girja are other important tributaries of river Purna which flow through the district. The southern part of the district falls in Godavari sub basin. A very small part of the district located North East of the district falls in the Tapi basin.

The general slope of the area is towards Southeast.

The average altitude above mean sea level is 534 Mtrs. (A.M.S.L.).

3.6.2 Geology

The entire district is occupied by basaltic lava flows of the Deccan traps of upper cretaceous to Eocene age.

The lava flows are piled over one another. The individual flow thickness ranges between 20 to 30mtrs. The individual flow has two distinct units. The upper part is vesicular in nature and vesicles are filled with secondary minerals like zeolite and quartz (e.g. Moss Agate, Zebra Agate and Green Agate) which is often called as zeolitic trap. The lower part of the lava flow forms the massive basalt, and often called as massive trap. Alluvial deposits along the major rivers overlie the Deccan traps.

The alluvium consists of clay, silt and sand. The thickness ranges between 10 to 20mtrs. The alluvium forms a very fertile land.

Meteorology

Meteorology is dealt first. The climate of the district is characterized by a hot summer and general dryness except during the south-west monsoon. The year can be divided into four seasons. The cold season from December to February is followed by the hot season from March to the first week of June. The south West monsoon season is from the second week of June till the end of September while October and November constitute the post monsoon or retreating monsoon season.

3.6.3 Temperature:

The district has a sub-Tropical climate, in which the bulk of rainfall is received from the southwest monsoon, between June to September. The average annual rainfall of the district ranges between 650 to 750mm. The district often experiences drought with rainfall recording as low as 400 to 450 mm. The rainy season is followed by Winter, which last up to February, during which the minimum temperature ranges between 7°C to 10°C and maximum temperature ranges between 27°C & 33°C.

The winter is followed by hot summer, which continues up to June. The maximum day temperature ranges between 42 & 43°C during summer.

Table 3.13 Temperature Observation

Date	Nov		Dec		Jan	
	Min	Max	Min	Max	Min	Max
Time	8.30	17.30	8.5	30	15	27.5
1	15.5	33	10.1	28.7	16.7	27
2	17.2	32	9.4	28.5	15.6	31
3	17	32.7	8.5	28.7	14.2	32.5
4	14.2	31.5	7.5	29.5	12.1	30
5	11	32.5	7	31	14.7	30.5
6	11.4	31	9.5	30.2	11.7	29.5
7	12.7	33.5	8.7	30	10	31.2
8	20	29.5	8.8	32	10.5	30.2
9	19	29	8.2	32.5	8.5	29
10	19	31.5	7.9	31	7	27
11	19.5	30.5	7.2	29	7.4	26
12	19	32.5	8	29	6.3	29.5
13	18	33.2	7.5	28.2	6.5	30.3
14	17.5	33	7.6	30	8.2	31.5
15	18.7	32.5	8.5	30.7	9	29.3
16	17.6	32.2	8.2	30.7	10	28.5
17	15.3	33.8	8	30	7.13	26
18	15.5	32	6.9	29	5.3	27.5
19	13	32.2	8	28.1	6	29.5
20	11.2	31.5	9.3	30	8.7	30
21	12	31.5	12	30.7	12.7	31.5
22	11	31.2	10	30.7	11	29.5
23	10.5	31	10.1	30	9.5	31

24	9.5	30.3	11.8	29	13	32
25	11	30	11	28.5	14	30.5
26	10.6	30	11	28	13.2	29
27	9	29.5	13.5	27	16	25.5
28	12	29	12.5	27.7	14	27.5
29	9.5	30.5	11.5	29.5	16.5	25.6
30	9.6	30	14.3	30	15.4	27
31			11.4	30.3	15.7	26.3

Temperature Observation

(Data source Hydrology Department)

From the table one finds that :

The maximum temperature range at Jalna is 32.5 and 19.5, with difference of about 90C

The minimum temperature range at Jalna is 9⁰C to 16.7⁰C. In Jalna, December and January have less temperature.

3.6.4 Humidity:

The air is generally dry during the months from February to May and particularly so in the afternoons when the humidity is about 20 percent on the average. The relative humidity during south-west monsoon period is between 60 and 80 percent. Thereafter they decrease rapidly. Except during the south-west monsoon season the air generally dry particularly so in the afternoons. Skies are generally clear or lightly clouded during most of the year. During the south-west monsoon season the skies are heavily clouded to overcast. Winds are generally light to moderate in force with some strengthening during the monsoon season.

3.6.5 Cloudiness:

During the monsoon season the skies are generally heavily clouded or overcast. During the rest of the year the skies are mostly clear or lightly clouded. However, in the cold season, for brief spells of a day or two, occasionally, passing western disturbances cause cloudy weather. In the latter part of the summer season, especially the afternoons, clouding increases. In the post-monsoon months the cloudiness decreases. In the rest of the year the skies are clear or lightly clouded.

3.6.6 Wind speed and Wind direction

Depressions in the Arabian Sea during May and June, which move northwards, near the coast and depressions from the Bay of Bengal during the monsoon season moving across Madhya Pradesh affect the weather over the district causing local winds. Occasionally depressions from Bay of Bengal during October move westwards across the peninsula emerge into the Arabian Sea and move forwards the Gulf of Cambay. Such depressions also affect the district. Winds are generally light to moderate with increase in speed during half of summer and in monsoon season. The predominance is W and NW in summer months, SW and W in monsoon and post monsoon months and S and SE in winter months. The wind speed and percent number of days of wind direction are presented in a tabular form below:

Table-3.14-Hourly Meteorology Data used for Model

Time	W.D.	W.S.	Temp.	Stability	M.H.
Hr.	Deg.	m/s	Deg. K	Class	m
1	97	2.1	288	6	50
2	113	2.2	287	6	50
3	72	2.3	285	6	50
4	36	0.9	284	6	50
5	90	2.8	284	6	50
6	44	1.4	284	6	50
7	36	1.1	286	2	50
8	0	0	289	2	50
9	49	1.5	292	1	200
10	72	2.4	295	2	500
11	135	4.4	297	2	700
12	120	4.2	298	2	1000
13	130	4.6	299	2	1200
14	90	3.3	300	2	1200
15	113	3.8	301	2	1200
16	94	3	300	2	1200
17	113	3.3	299	3	1000
18	61	1.8	296	2	700
19	48	1.4	293	6	600
20	0	0	290	6	400
21	25	0.7	288	6	300
22	14	0.3	287	6	200
23	45	1.1	287	6	100
24	11	0.1	287	6	100

3.6.7 Windrows

Hourly meteorological data recorded at site for Nov-Dec-Jan 2014-2015 on wind speed, direction and temperature is used as input. Site specific wind-rose for this season is shown in **Figure 3.7**. For the site-specific mixing heights CPCB document PROBES/88/2002-2003 is followed. Average hourly data for 24 hrs used for modeling is tabulated in **Table-3.14**

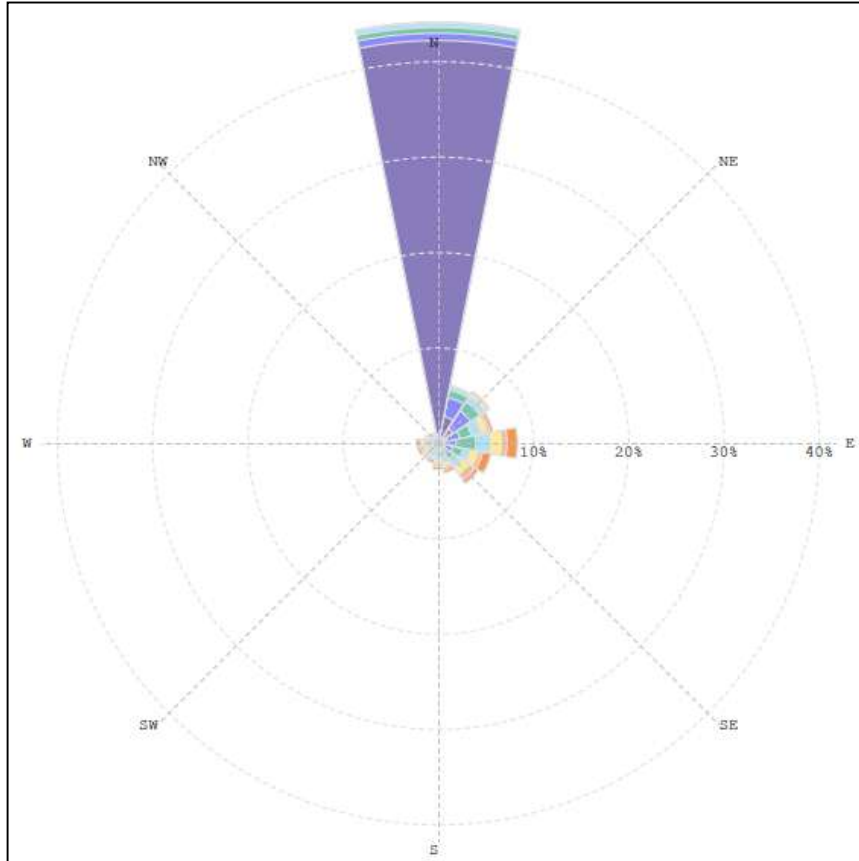


Figure-3.7: Wind Rose (Nov., Dec. Jan.)

3.7 BIOLOGICAL ENVIRONMENT

3.7.1 Biological assessment:

Five stations each were surveyed for flora and fauna studies in the 10 km radius. The location of these stations is shown in **Figure3.8**. The stations are as under:

Table 3.14 Flora and Fauna survey locations

Flora and Fauna	
Code	Name
A	Project site
B	Near Ghanewadi Dam
C	Near Motitalav
D	Near Shirswadi lake
E	Near Shelgaon village road

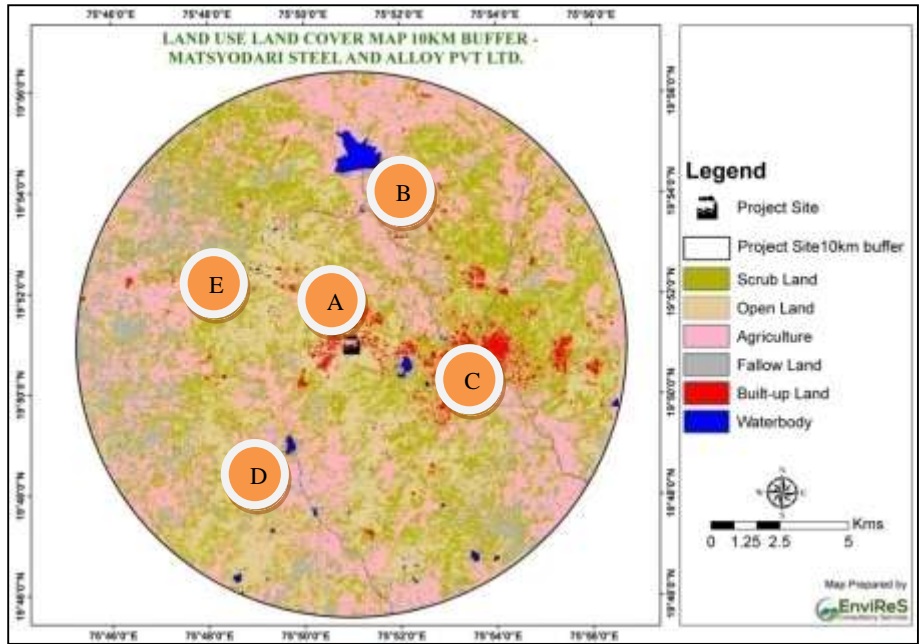


Figure: Locations of Avifauna survey and Vegetation, A-E

3.7.1 Flora

The project site exhibits some varieties of plants like *Calatropisprocera*, *Cassia tora*, *Micheliachampaca*, *Cocosnucifera*, etc. There is no aquatic body within the project site. 29 genera and 29 species from 20 families were found during field studies. **Annexure II** provide the details collected by Ultra Tech during field visit.



3.7.2 Fauna

Methodology

Field observations of avifauna were carried out during February 2015. The diversity of fauna basically depends upon density and diversity of flora. The existing fauna i.e. mammals, amphibians, reptiles, butterflies, dragonflies and damselflies in and around project site were enumerated. Further, information towards faunal diversity from secondary sources was collected on interaction with the local people and Forest Dept officials.

Observations

The domestic animals in the study area mostly comprise of squirrel, goat, buffalo, dog and cow. The survey revealed that 10 species of mammals were recorded in and around study area (**Annexure III**). Study area comprises of 13 species of butterflies, dominated by Small & common grass yellow, Common Indian crow, Lime butterfly, Common evening brown etc. Four species of dragonflies and three species of damselflies were recorded. Damselflies like *Ischnura aurora* and *Ischnurasenegalensis* were recorded in the periphery of the project site. Besides avifauna, which has been addressed separately, 3 species of amphibians and 4 species of reptiles were recorded. None of these animals are endangered (Schedule I) as per Wildlife (Protection) Act 1972.

Avifauna in the study area

A total number of 37 species of birds were encountered in the surrounding areas during the survey (**Annexure III & Plate 3.1**). The birds like peafowl, crows, sparrows, bulbuls, babblers and pigeons were observed in and around villages. In areas with agriculture fields, the grain eating herbivorous species like, doves, sparrows and parakeets while Insectivorous bird species viz. green bee eater, white breasted kingfisher, cattle egrets, swallows etc. were found around water bodies and vegetation in low-lying areas. Indian peafowl is listed endangered (Schedule I) as per Wildlife (Protection) Act 1972.



Large Egret



little cormorant



parike



eat



fisher

Plate 3.1: Birds observed in and around study area

B) Aquatic Preamble

Plankton is an important component of ecosystem, which responds to ecosystem alterations rather rapidly. It is due to the fact that planktonic organisms, which react to different types of water pollution, play a key role in turnover of organic matter and energy through the ecosystem. This reaction is very rapid because of relatively short lifetime and high reproduction rates of the organisms.

Water sample within 10km periphery were collected from Moti talav and Pankheda dam (Plate 3.1). Moti talav is main lake in the city and anthropogenic activities like vehicle washing, bathing etc. were carried out (Plate 3.2) which might be causes organic pollution in the lake. Samples were collected from the lake (Plate 3.3). In view of low depth, only surface samples were collected. To enumerate phytoplankton, unfiltered surface waters were collected from the water bodies. Phytoplankton samples were immediately fixed after collection in Lugols Iodine solution so as to prevent adverse effects of light and temperature which might cause rapid decay of organisms. Further microscopic analysis was undertaken in laboratory. For zooplankton, desired volumes of water were filtered through plankton net having mesh size of 75 μ to represent all the available groups.



Plate 3.1: Panoramic view of MotiTalav and Pankheda dam



Plate 3.2: Anthropogenic activities in and around Motitalav



Plate 3.3: Collection of plankton from Motitalav

A] Phytoplankton

Count : Phytoplankton counts recorded at different sampling stations, are presented in **Table 3.1**. Total algal population varied between 3970 and 5630 algal cells ml⁻¹. Motitalav showed highest count of phytoplankton. As the anthropogenic activities were carried out in and around the lake might be reason of high plankton count. The phytoplankton population comprised of 4 major groups, namely Bacillariophyceae, Chlorophyceae, Cyanophyceae and Cryptophyceae. Bacillariophyceae dominated all the samples indicating good water quality. Besides diatoms, the most common genera

were *Fragillaria*, *Anabaena*, *Ulothrix* etc. The average scores of PPI varied within the range of 19 - 22, indicating probable organic pollution while the SWI values varied between 0.96 and 2.23 that suggest low to medium impact of pollution or adverse factor. Solid waste disposal and surface run off coming out from surrounding areas might be a reason for organic pollution in the lake.

Table 3.1: Enumeration of Phytoplankton in Motitalav and Pankheda dam

Sample No.	Name of River	Phyto-plankton (No/ml)	Percent Composition of algal groups				SWI	PPI
			Cyano-phyceae	Chloro-phyceae	Bacillario-phyceae	Crypto-phyceae		
1.	MotiTalav (East side)	5630	60	20	10	10	2.23	22
2.	MotiTalav (West side)	4620	50	20	20	10	1.56	20
3.	Pankheda dam (East side)	4500	65	20	15	-	0.96	19
4.	Pankheda dam (West side)	3970	55	15	20	10	1.69	21

Table 3.2: Enumeration of Zooplankton in Motitalav and Pankheda dam

Sides	Zoo-plankton Count No/m ³	Percent composition of zooplanktons groups			SWI
		Rotifera	Copepod a	Cladocer a	
MotiTalav (East side)	10250	50	30	20	1.20
MotiTalav (West side)	9250	40	30	30	1.98
Pankheda dam (East side)	6750	65	15	20	1.52
Pankheda dam (West side)	6500	50	20	30	0.96

Ranges of Palmer's Pollution index (PPI)

<15: Indicate absence of organic pollution
 15 - <20: Indicate presence of organic pollution
 >20: Indicate presence of high organic pollution

Ranges of Shannon Wiener Diversity Index (SWI)

<1: Indicate poor productive water
 1-3 Indicate medium productive water
 >3 Indicate good productive water

Ranges of Shannon Wiener Diversity Index (SWI)

<1: Indicate poor productive water
 1-3 Indicate medium productive water
 >3 Indicate good productive water

B) Zooplankton

Zooplankton counts, recorded at different sampling stations, are shown in **Table 3.2**. Density of zooplankton varied between 6500 and 10250 N/m³. A large number of zooplankton, recorded in Motitalav could be due to the presence of ample amount of phytoplankton in the respective stations. Rotifera was dominant. The SWI, observed to vary from 0.96 to 1.98 indicated low to medium load of organic pollution or adverse factors.

3.8. Socio-Economic:

The present section addresses the socio-economic environment of the 10 km radius area for the M/s Mastyodari Steel & Alloys Pvt. Ltd. It includes description of demography, available basic amenities such as housing, health care services, education, transportation etc.

3.8.1 Jalna District: Basic Information

Jalna district is approximately situated in central part of Maharashtra. The boundaries of Jalna district are adjacent to Parbhani&Buldhana on east, Aurangabad on west, Jalgaon on north and Beed on south. It covers an area of 7,616 sq. km, which is 2.47% of the total state area. Out of the total geographical area 7616 sq. km. (98.68%) is rural and 34.5 sq. km. (1.32%) is urban.

There are 960 villages in the district with 4 towns. The district has a population of 1,959,046 representing 1.74% of the state population with a population density of 254 persons per sq. km. The decadal growth rate was 21.46%. The district has a sex ratio of 951 females for 1000 males and a literacy rate of 71.52%. Table 3.18 presents these details.

Table 3.18: Demographic Attributes for Jalna District

1.	Area	7616 sq. km.
2.	Population	1959 thousand
3.	Decadal Growth rate	21.46%
4.	Male population	826 thousand
5.	Female population	786 thousand
6.	Density of population (persons per km²)	254
7.	Sex Ratio (females per 1000 males)	951
8.	Literacy	71.52%
9.	Male literacy	81.53%
10.	Female literacy	60.95%
11.	Urban Population	19.27%

Source: Provisional Population Totals, Census of India 2011

3.8.2 Project Location

M/s Mastyodari Steel & Alloys Pvt. Ltd. is located in MIDC of the Jalna at Plot no. D-31/32, Additional MIDC, Jalna, Dist. Jalna, Maharashtra.

3.8.3 Database and Methodology:

The data is collected and analysed using secondary sources viz. Census Reports, District Statistical Abstract etc. The 10 km radius area is known as the Study Area, and it consists of 31 villages, 1 town spread over the talukas of Badnapur and Jalna in the district. The demographic profile, infrastructure facilities and socio-economic condition is being described under different classifications in the following section.

3.8.4 Demography

Summary of demographic information with reference to population, household, literacy, community structure and employment are presented in Table 3.19. There are 64,863 households in the study area and the average size of household is 5.28 members per household.

The details regarding the demographic aspect of the study area is taken from Census of India website.

Population size ranges from 221 persons in Pankheda to 5336 in Deomurti village and 285,577 in Jalna city. Population within the age class 0-6 year accounts for 13.80% of the total population in the study area.

Table 3.20: Demographic Characteristics of the Study Area

Name	No. of HH	Total Population	Male	Female	Sex Ratio	Population (0-6)	Size of HH
Total	64863	342760	177167	165593	935	47324	5.28

The demographic characteristics of the study area are depicted in Table 3.19. Average sex ratio for the study area is 935 females per 1000 males, which is lower than the sex ratio of the district (937) and higher than the sex ratio of the state (929). Some villages such as Kharpudi (587), Nidhona (839), and Antarwala (850) has a very low sex ratio, whereas Tatewadi (1020), Matarewadi (991) and Shelgaon (972) has higher sex ratio.

According to the 2011 census, the ratio of scheduled caste population in the study area to the total population is 13.80% and scheduled tribe population is 1.50%. This can be observed in Table 3.20.

Table 3.21: SC & ST population and Literacy Status of the study area

Name	Total Population	SC	ST	Literates	% SC	% ST	Literacy rate
Total	342760	47300	5146	236763	13.80	1.50	80.14

The average literacy rate is 80.14%, which is considerably higher in male population (86.26%) as compared to female population (73.63%). The average literacy rate is higher in the urban settlements of the study area (81.80%), as compared to the rural settlements (71.74%). The literacy rate of 80.14% is higher than district (71.52%) and slightly lower than state (82.34) averages.

Working Population

About 36.29% of the total population is total workers in the study area, engaged as cultivators, agriculture labours, households industry, others etc (Table 3.21). Of the total workers, nearly 88.36% are main workers, of which male main workers are (75.35%).

Table 3.22: Status of working population in the study area

Name	Total Workers	Main workers				Marginal Workers	Non Workers
		Cultivators	Agricultural Labourers	Household Industry	Others		
Total	124382	11473	10947	3921	83560	14481	218378

Of the total main workers cultivators (10.44%) and agricultural labour (9.96%) together constitute 20.40% of the total main workers, whereas 76.03% of main workers are engaged in others category. It reflects that 76% of the main workers in the study area are engaged in other category such as manufacturing, processing, servicing and repairs, trade and commerce and agricultural sector has absorbed only 20% of the total workers.

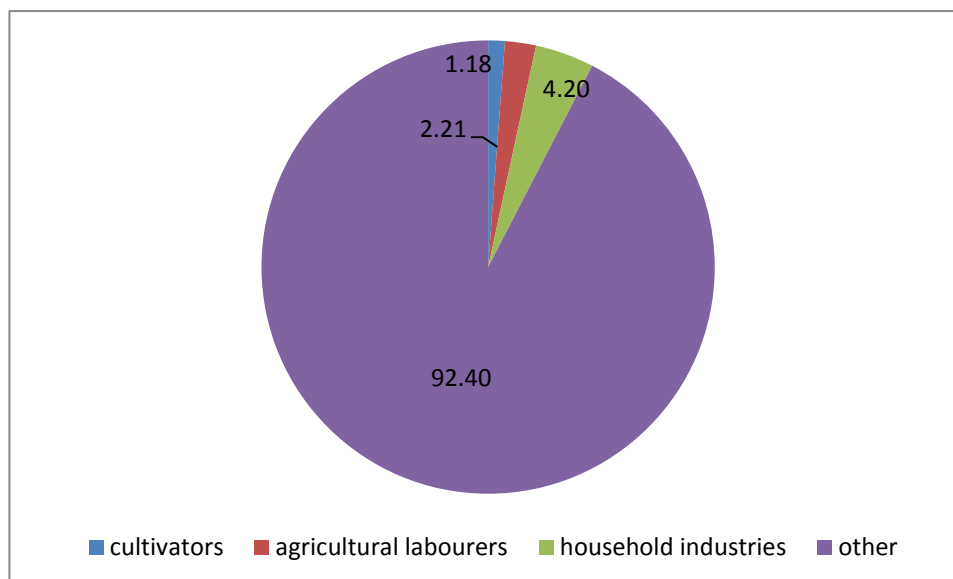
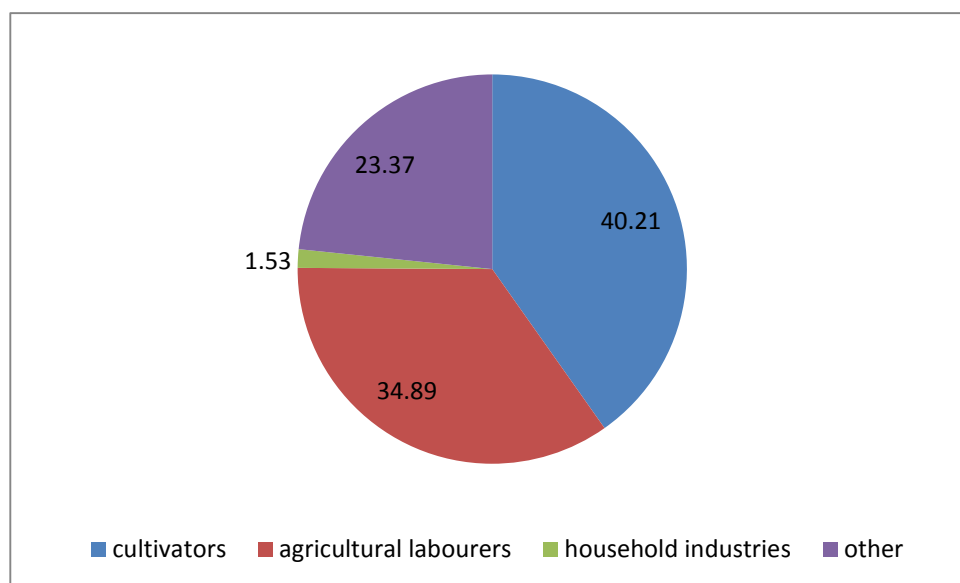


Figure: Distribution of Main Workers in urban and rural area
Urban Main Workers



Rural Main workers

Rural & Urban Population

Out of the total population of study area, 83.32% lives in urban regions and only 16.68% lives in rural areas of villages. In total 285,577 people lives in urban areas of which males are 147,092 and females are 30,075, whereas 57,183 people live in rural areas of which males are 30,075 and 27,108 are females.

3.8.5 Infrastructure

This section analyses the infrastructure facilities like water supply, roads, markets, banks, post offices, schools and electrification in the study area.

Educational facilities at the minimum level of primary education are available in all the villages of the study area. There are many villages having more than one primary school. Jalna town in the study area is renowned educational centre with top colleges and schools

providing quality education. After the completion of school, students for higher education the go to the city like Jalna& Aurangabad.

Medical facilities of one or the other type are available in all the villages in the study area. There are about 40 primary health centres (PHCs) and 171 sub centres in the district. Public health facilities in the talukas of the district are majorly located in rural areas, excepting in Jalnataluka where 10 of the 17 facilities are in the urban areas. However, the distribution of private health facilities in the talukas is disproportionate to the percentage of urban population in them. In Jalnataluka, a whopping 87.67% of the private health facilities are in urban areas.

Post facility is available in all the villages and towns of study area. Although phone connections are available in most of the villages but people tend to use mobile phones for communication.

Drinking water is not a problem as most of the villages and towns have the facility of tap water and well water. Water is also sourced from borewells&handpumps. Although supply is good but there could be acute shortage in the summer months due to poor rainfall etc.

Road and Rail connectivity is good as all villages and towns are connected with roads and connected by bus services. Jalna is primarily connected with the rest of India by railway and road. Jalna is a station located on the Kachiguda-Manmad railway. Jalna is connected to major towns of the state by state highways. Road connectivity is excellent, roads connecting to Aurangabad, Pune, Ahmednagar, Nagpur, Beed, Mumbai having been upgraded to four-lane highways. A New Nagpur-Aurangabad-Mumbai highway, passing through Jalna, is being developed. All villages and town (100%) are enjoying power supply facility for all the purposes.

3.9 Historical/Archeological/Forest

No cultural heritage site (temple, mass bathing site during religious festivals, etc) is located close to the project site that could be affected during the construction stage.

3.10 Industries

Jalna district is relatively industrially backward as compared to some of the other advanced districts of Maharashtra. The lack of good quality infrastructural facilities, inadequate local market, unavailability of skilled labour, immobility of local persons and lack of entrepreneurial environment are some of the major constraints for the lack of industrialization of the district. There is one large MIDC Jalna, consisting of large, medium, and small-scale industries. It has large number of steel rolling mills; agro-based units like dal mills and, most significantly, a large number of seed manufacturing units.

The industries are facing the major problems of frequent power cut-off, water shortage etc. There are 24 large and medium scale industries in Jalna district, out of which 4 are sugar factories.

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**CHAPTER 4 - ANTICIPATED ENVIRONMENTAL IMPACT ASSESSMENT,
PREDICTION AND MITIGATION MEASURES**

IMPACT ASSESSMENT

4.1 Air Environment

As the secondary steel making based on Induction furnace manufacturing does not use any fuel, emission is being generated during raw material/scrap charging to the furnace. The emissions mainly consist of suspended matter (dust, rust, etc) and fumes. The emissions are washed in a wet scrubber before discharge to atmosphere by a 1.2 dia, 80 m tall furnace stack in the existing plant. For the expansion project, it is proposed to follow the scrubbing prior to discharge to atmosphere by a 1.5 m dia, 80 m tall stack for better pollution control.

The air pollution caused by this industry is mainly from dust as SPM and fumes. The dust is due to the composition and handling of raw material and fumes are from furnace level as well as from ladle and roof level.

The emissions from the furnaces are absorbed by a swiveable suction hood, attached to the side of the Furnace. The base of the swivel is maintained on a contraption, which will connect the hood with downstream suction line connected to wet scrubber followed by cyclone.

The combined removal efficiency of air pollution control system is ~99%. The exhaust gases from stack shall meet MPCB norms of 150 mg/m³.

This industry will be providing this system to the unit in modules for furnace in two nos. as

- Suction hood (swinging) 1.2 m dia x 0.4 m deep
- 7 HP special duty fan, 2880 RPM along with geared motor
- Duct from hood to cyclone
- Scrubber, two numbers, Height 1.5 m x Length 1.2 m x Breadth 1.2 m
- Water separator assembly with spin and antispin baffles
- Centrifugal Blower with 70 HP/1440 RPM motor
- Stack Dia 1.3 m at top x height 42 m

Emissions are only from sources, and the proper stack is provided after the Control Equipment.

Table No. 4.1 Stack details

Parameters	Unit	Proposed stacks Attached to DRI Kiln & Boiler	Proposed stacks attached to Furnaces
Stack height	M	80	42
Stack diameter at exit / top	M	1.5	1.3
Stack exit gas velocity	m/s	12.3	6.7
Stack gas temperature at exit	Deg. C	122	106
PM Emission	mg/Nm ³	89	67
	g/sec	1.46	1.2
Air pollution control equipment		ESP	Ventury/scrubber

Although, no emission is expected from the stack, nonetheless, dispersion modeling has been done assuming 50 mg/m³ particulates. The isopleths are presented in Figure 4.1. it is not we do not expect any.

Air quality impact is envisaged due to operation of proposed additional two Induction Furnace of 30 T capacities. Electricity will be used for heating the furnace. ESP for fume extraction system is proposed with WHRB and Kiln.

The only emission from 42 m tall stack shall be Particulate Matter, SO₂ & NO_x and the same is considered for modeling. Maximum allowed, 150 mg/NM³ has been used for modeling purpose.

Ground level concentrations (GLCs) have been predicted using AERMODCloud software. The application incorporates popular U.S. EPA air dispersion models AERMOD and ISCST3 into one integrated graphical interface. The model follows rural dispersion and regulatory defaults options as per guidelines on air quality models (PROBES/70/1997-1998).

4.2 Water Environment

Water is required for cooling water makeup and domestic purposes. Domestic wastewater is treated in septic tanks with overflow being used for green belt.

Water input and effluent generation additionally can be summarized as:

Table No. 4.3: Water Budget

Sr. No.	Unit	Water requirement in KLD	Waste Water Generation in KLD	Disposal
1	Domestic	25	20	Sewage Treatment Plant
2	Boiler & Cooling	1100	35	Sober
3	Green Belt	25	--	--
	Total	1150	55	

The quality of domestic wastewater is expected to be:

Table No. 4.4: Characteristics of domestic WW

DESIGN PARAMETER	INLET VALUE	OUTLET VALUE
pH	6.5-8.5	7-8
BOD ₅	250-300 mg/lit	≤30
COD	350-450 mg/lit	≤250
Suspended Solids	200-300 mg/lit	≤100
Oil & Grease	10-15 mg/lit	≤10

The sewage will be Extended Aeration System STP of capacity 20 m³ which includes tertiary treatment as well and the overflow used for landscaping after disinfection.

Since there is Moti talav and Pnakheda dam within 10 km of surroundings, no impact on this water body is carried out as there is no discharge of wastewater from the Industries.

The present plot of this project has undulations. The buildings and the plinths will be so adjusted as the cutting should balance the embankments or filling and a small quantity of fill material will be required from outside

4.2.1 Rain Water Harvesting:

Proposed the rainwater harvesting system. During the rainy season, the rain water falls over the roof of the building which can be collected and then diverted to the Raw water tank of through water treatment. This water can be used as Process, in the plant during rainy season which will reduce the burden on MIDC water supply. Excess water will be disposed into existing MIDC storm water drain.

For RWH we are providing 7 Nos. of recharge pit within the project premises.

4.3 Socio-economic status

- The construction period is expected to generate employment opportunities for the people. During construction period, hundreds of people would be visiting the industry, for construction works, suppliers of material and related activities.
- Temporary sheds will be provided for accommodation of these workers during construction period.
- Safety and health care of workers is also an important factor to be considered during construction phase.
- Hazards expected are electrocution, vehicular accident, fall of personnel from overhead works, high level noise due to construction machinery, exposure of eyes to dust and welding rays.
- Resettlement issues, R&R issues are not involved with this project as located within existing MIDC plot.

Mitigation Measures

- Employing local people for construction work to the maximum extent possible.
- Providing proper facilities for domestic supply, sanitation, domestic fuel, education, transportation etc. for the construction workers.
- Barricades, fences and necessary personnel protective equipment such as safety helmet, hoes, goggles, harness etc. will be provided to the workers and employees.
- Constructional and occupational safety measures will be adopted during construction phase of the industry.
- The health of workers will be checked for general illness; first time upon employment and thereafter at periodic intervals, as per the local laws and regulations.
- The workers will be diagnosed for respiratory functions at periodic intervals and during specific complaints etc. Health centre and ambulance facility will be provided to the worker.
- Workers exposed to dust and noise will be given personnel protective equipment like nose masks, face shields and ear plugs. Job rotation schemes will be practiced for over-exposed persons. Insignificant impact is expected on the workers health and safety during the construction stage.
- The construction period is expected to generate employment opportunities for the people.
- Safety and health care of workers will be considered during construction phase.
- No R and R issues as the Project

4.4 Solid Waste Management:

Following mitigation practice is the policy for future:

- Minimization at all levels need be attempted for discarded products, packing surpluses, incoming raw material unloading spillages and fugitives. The factory has scrap materials. All these, however, be carefully stored on raised platform with dwarf toe walls all around, and a roof over-head.
- The main solid waste generated during the process is Ash. These will be disposed off using the Ash handling system. The part of ash can be utilized in the Road construction process and it can be used for brick making etc.
- The solid in process generate only as slag. This is non-hazardous and in fact good building material. Even can be used in cement mills.
- Other will be empty drums which can be used for refill or may be disposed to original vendors. The colony is very small the organic portion will be composted and inert sent for low land filling.
- These measures can easily be taken by OSSAPL because (1) they have no discards or off-specification products, and (2) the waste is fully recycled both in green stage and in dry stage.
- Quantification in Cubic meters per day for the unit can be presented as follows:

(A) Non Hazardous Solid Waste:

Based on above working, the summary is

Table No. 4.5: Solid Waste per Day

#	Waste	Qty	Treatment	Disposal	Remark
1	STP	5 Kg/day	Treated	Own garden	Organic, Non-Haz
2	Office		--	Sales	Non-Haz.
3	Process	12MTM	Refractory	Sales	Inert and Non-Haz.
		312MTD	Dolochar	Reuse	Will be used FBC Boiler as fuel
		118MTD	Ash	Sale	for brick manufacturing
4	Slag	170MTD	Segregation	Sale	for brick manufacturing, and building construction

Residential colony is absent and small is the labor strength attending the shifts. The municipal waste from the worker and canteen is thus controllable. This will be composted and used in due course on own land as manure. Plastic use is discouraged. STP sludge is digested. Thus after dewatering can be used on land for conditioning. Office and packing trash is kept to minimum and disposed by sales or reused.

4.5 Greening belt

Objective:

This industry provides 4,450 m² area for gardening and proposed 56 No. of trees to be planted. To provide a measure of air pollution mitigation, fugitive dust control, shed for men, cooler atmosphere, camouflage the land-use, aesthetics of the region, absorption of green-house gas, utilization of NPK of the wastewater after treatment.

Methodology

Design of Plantation will be such as:

- No interference for future activities
- Locally grown species with large canopy
- Be nearer to source of water and supervision.
- Capability of securing maximum survival rate with an aim of 100%

Selection of species will be done by detailed considerations:

- A large variety of species selected to have bio-diversity
- Species that will grow rapidly under local dominant stress of soil salinity, high wind, water needs, sustainability in dry months

Sections will be at least four for greening drive:

- Three row curtain on periphery
- Avenue trees near approach road and internal roads
- Ornamental trees in the garden

4.6 MITIGATION MEASURES

Construction:

Construction phase is for small duration. Heavy civil construction is not involved; mostly it will be fabrication erection.

Precautions will be taken for noise, dust and wastewaters control.

As such no major construction impact is expected.

Operations:

Operation phase shows a relatively safe expectation, as compared with many other types of chemical industries. Only one Raw Material, simple manufacturing process, makes this aspect easy and devoid of apprehended accidents. The raw material is brought on JIT (Just in Time) principle from adjacent town centers, and there will be a warehouse to store it.

The emissions from 42m & 80 m tall stack are SPM, SO₂ & NO_x to the tune of 50 mg/NM³ max. after collection in ESP & wet scrubber.

All precautions as per Factory Act shall be taken. Fire protection system will be in place as per Acts and Insurance Companies.

Table No.4.6: Emission Control Measures

#	Source	Pollutant	In-plant Measures & Control Equipment
1	Raw material unloading Yard	SPM road dust	Leveled Roads & land, rubber tyre, slow speed, water sprinkle
2	Raw material handling	SPM	With mechanical help of EOT
3	Furnace and unloading in ladles	Fumes	Furnace covered by swinging hood Cyclone with wet scrubber proposed
4	Finished product handling	Airborne dust,	Leveled Roads, rubber tyre, slow speed. Mechanical loading

CHAPTER 5 - ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

It is necessary that project proponent should look for alternatives and select the one which is environmentally best.

5.1 Raw materials and Technology

Presently this industry produces ingots/billets using induction furnace as main process. Raw materials include iron scrap/sponge iron, coal and small quantities of manganese, silicone, aluminum, chromium, copper, etc as per the order specifications. Use of metal scrap leads to iron ore resource saving and hence, proposed to be continued. There is addition of production of sponge iron & thermal power plant from waste heat recovery & coal fired boiler having capacity 50 MW.

The raw materials for the proposed project shall also be the same based on the experience and technology. The process for production of sponge iron, Thermal power & ingots/billets is quite simple and involves just melting, casting and cooling. A simplified block diagram is given in Figure No.5.1.

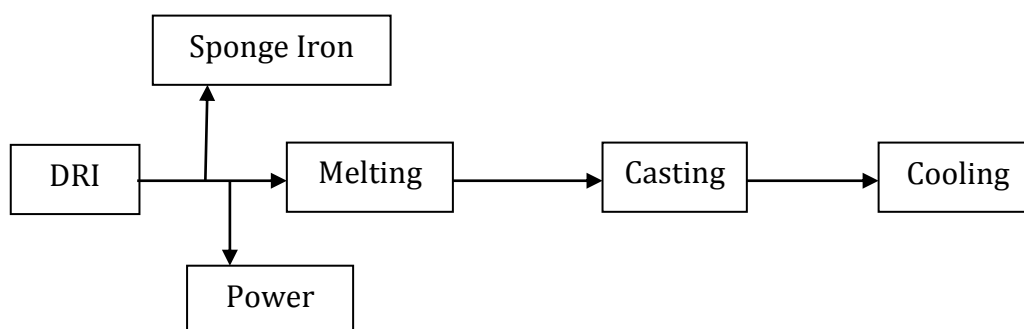


Figure 5.1: Simplified block diagram

The process development and engineering design of this project has been done so that the entire manufacturing will be carried out in a controlled environment with minimal emissions, effluents, and solid waste generation. The material handling and transfer of raw materials will also be done in environmentally safe manner.

MS scrap is outsourced from listed reliable suppliers to ensure uninterrupted supply. Hence a very small raw material inventory will be maintained. MS scrap & Sponge iron is mechanically charged to Induction furnace to minimize air borne pollution.

5.2 Site Alternatives:

No other site has been examined as the existing plot has sufficient land for the installation of additional capacity. This will also help proponents to optimize the use of existing facilities.

It may also be noted that other industrial units are located on all sides of this plot, Table 5.1, and no habitation exists nearby. There are no sensitive receptors in the vicinity.

Table No.5.1: Industries around the Site

Sr. No.	Industry	Towards	Distance from Site, km
1.	Bhagyalaxmi Steel	West	0.3
2.	SRJ Preety Steel Pvt. Ltd.	North-East	0.4
3.	Rajuri Steel Pvt. Ltd.	South	0.1
4.	Kalika Steel Alloys Pvt. Ltd.	East	0.1
5.	Meta Rolls & Modities Pvt. Ltd.	South	0.4
6.	Rhishi Steel & Alloys Pvt. Ltd.	North-East	0.09
7.	Mastyoradi Steel & Alloyed Pvt. Ltd.	East	0.5

5.3 'NO-PROJECT' Option:

The district statistical Census report and Gazetteer of the District states that the socio-economic conditions in this district are very poor. To improve the status, industrialization will be a big boost. In this background, **OSSAPL** has proposed this Project to produce quality steel to meet the market demand.

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CHAPTER 6 – ENVIRONMENTAL MONITORING PROGRAM

6.1 Introduction

The proposed project, though, has minimal environmental impact, nonetheless, to control and limit the pollution level to desired level; an effective EMP is a must.

In view of above, it is proposed to establish a monitoring protocol for air, water, noise and solid waste soil. The stations will be the same as where the samples are taken while preparing this EIA. It is proposed to outsource the EMP to an accredited Consultant.

Table No.6.1: Summary of Sampling

No.	Attribute	Location	Parameters	Frequency
1	Surface Water	6	11	Yearly
2	Ground Water	5	11	Yearly
3	Ambient Air	8	3	Yearly
4	Ambient Noise	8	2	Yearly
5	Soil	8	All	Yearly

For the proposed expansion, as the entire water is used for evaporative cooling, no effluents are generated. Small quantity of domestic waste is generated and it will be disposed using septic tank.

6.2 EMP structure and funds

OSSAPL will have a small environmental cell responsible for pollution control and for coordinating with monitoring laboratory. The cell shall be reporting to the promoter of **OSSAPL**, pl see Figure 6.1.

The structure:

Table No.6.2: Environment Management Cell

S No.	Level	Designation
1.	Promoter	Managing Partner
2.	Top	Gen Manager Works
3.	Manager	Manager Env
4.	Officer	Executive

Manger Environmnet will report to Promoter/General Manager

Table No.6.3: Functions of Environment Management Cell

S. No.	Aspect	Areas of work
1	Construction Phase	Waste minimization, General sanitation, Airborne dust control, noise and accident prevention.
	Post-construction	site remediation

2	Air	AP control system monitoring, Car/truck PUC, Noise mitigation, dust control.
	Water	Water budget, O & M of WTP and STP.
	Solid waste	Collection, segregation and proper disposal
	Greening	Green belt development, landscaping
	Monitoring	Coordinate with third party laboratory, interpretation & reporting to Promoter
3	Occupational Health	Routine surveillance, prevention, accident relief,
	Regulatory	Coordination with MPCB, filing analysis reports/ statements

For the purpose of Pollution Control, Resource Conservation and Environmental Protection, the Project Proponents will set aside suitable amount as capital expenditure and provision for recurring expenditure per year. It is proposed to earmark Rs148 lakhs on pollution control system as detailed below:

Table no. 6.4: Environmental Funds

#	Environmental Aspect	Capital Expenditure Rs in Lakh	Recurring Expenditure Rs in Lakh PM
1	Emission control Engineering	1082.00	25.00
2	Water & Wastewater management	75.00	2.60
3	Solid Waste	62.50	6.50
4	Greening Drive	22.00	3.50
5	Monitoring	0.00	1.35
6	Environmental Cell & PR	3.00	1.50
7	Other aspects like Rain Water Harvesting, Safety, Security etc	35.00	1.10
8	Occupational Health	15.50	1.45
9	Contingency	5.00	1.00
	Total	1300.00	44.00

6.2.1 Environmental Monitoring Schedule:

The monitoring schedule is decided as under (may be modified, if required)

6.2.2 Action Schedules:

There will be three facets to design and follow the schedules viz.: (A) for compliance of responsibilities, (B) for day-to-day operation and management of ETP and control equipment and (C) for routine environmental monitoring, to assess the impact and take timely warning. The schedule, for third aspect is:

Daily Compliance:

1. Take the meter readings - initial and final, for checking the water consumption.
2. Maintain the electricity consumption record for pollution control.
3. Monitor ambient air periodically as per Consent.

Monthly Compliance:

1. Monitor the emission sources through the competent authority and submit the analysis reports to the board.
2. Monitor ambient/work zone noise levels & ensure conformance to standards.

Quarterly Compliance:

1. Monitor the ambient air quality at upwind and downwind locations of the factory.
2. Review the Water Reuse performance.

Yearly Compliance:

1. Carryout “Environmental Audit Statement” of various environmental aspects, reviews the environmental policies with the help of experts and make the up gradation /changes accordingly.
2. Submit the “Environmental Statement” to the State Pollution Control Board in Form V under Rule 14 of the Environment (Protection) Second Amendment Rules 1992 of the Environment (Protection) Act, 1986.
3. Renew the Consent to Operate under the Water and Air Acts.
4. File the Cess returns to the State PCB under the Water (Prevention and Control of Pollution) Cess Act, 1977.
5. Renew the Hazardous Waste Authorization under sub-rule 3 of the Hazardous Waste (Management and Handling) Rules, 1989.

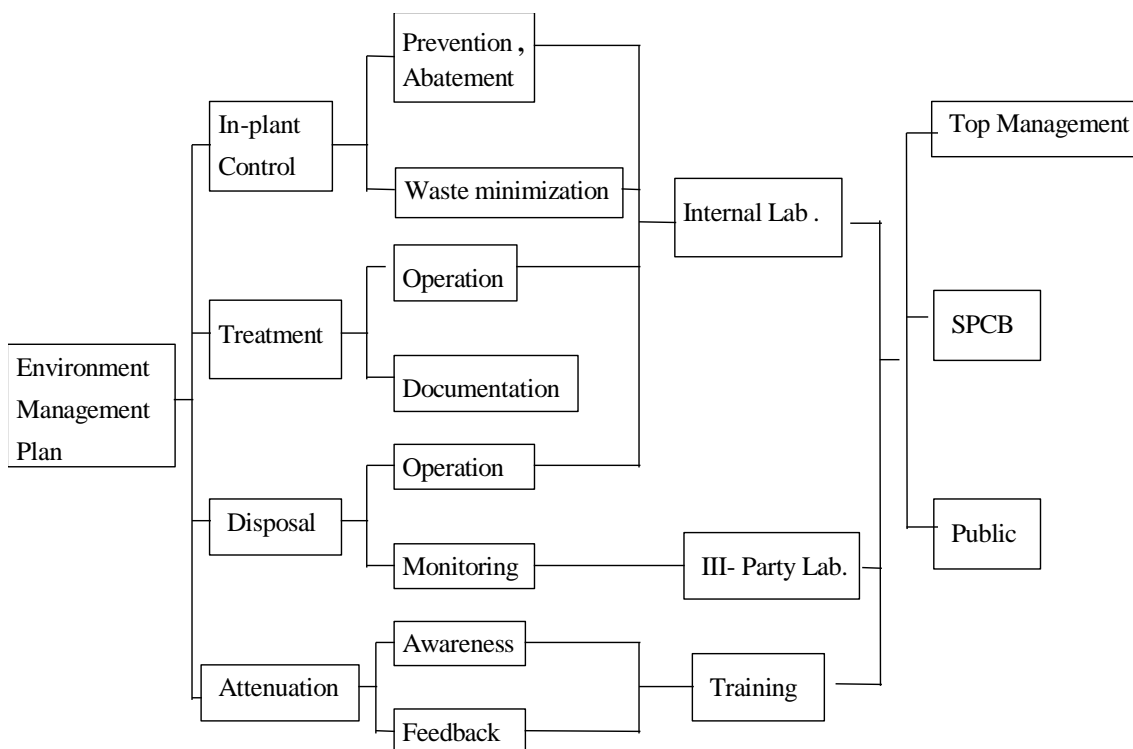


Figure No. 6.1 : Structure and duty of Env Cell

The ultimate aim is that the Proponents is to aim for **Sustainable Production**.

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CHAPTER 7 - ADDITIONAL STUDIES

7.1 Public consultation

This is a proposal for expanding an established Engineering industry of Large Size which is in a notified Government MIDC Industrial Estate, which on adjunct industrial area. This is mainly for one standard product of mild steel in form of billets and ingots but improving the process. The Proponents are M/s Omsairam Steel & Alloys Pvt. Ltd; presently at Plot no. Additional MIDC, Phase –II, Plot No: F-1,2,3,8,9,10 and Survey no.46&63, Daregaon, Jalna, Dist : Jalna Maharashtra and running. However, in order to ascertain the concern of the local persons, who have plausible stake in the environmental impact of this project, the Proponents thought it fit to interview some people as sample survey basis. These interviews were oral and informal. This was not to meet any statutory requirement or a mechanical formality. Proponent really wanted to know as to whether this project is a welcome addition in the minds of surrounding people. They never wanted to force their presence.

The interviews generally brought out the following points –

- The workings of existing steel units of other proponents are working well to give benefit to the local people.
- The payment of materials and wages here will be satisfactory, as also the weighment
- There is a constant rapport, open corridors for discussion and transparency in transactions.
- No odour or noise nuisance is felt.
- Sons of soil are employed and benefited.
- Establishing new venture to convert waste into wealth is a step in right direction for the small suppliers.
- It is however, necessary to see that no water pollution and odour nuisance is created by the unit, for which the proposed arrangement appears to be satisfactory.
- Sons of the soil should get preference in employment.

The MIDC neighboring industrial units, local people and Proponents are generally comfortable with each other.

The project attracts EIA notification and therefore needs Public Hearing and Public Consultation. Public hearing was conducted as per the EIA guidelines.

7.2 Risk assessment

The Environmental risks are inherent in operation of any industry, or any human activity for that matter. Any system failure can lead to disaster.

Steel manufacturing is a simple three step process, as seen earlier. However Risk is posed by (1) Dust in various operational steps and (2) Fuel, which here is in the form of electricity & coal.

Dust is generated in many steps from raw material handling, transfer, heating, cooling, transporting out and waste treatment. In order to reduce this risk, steps like capturing the same, conveying through ducts are attempted. Conveying by smooth internal roads, watering the roads, regular and quick sweeping and monitoring the efforts, are the minimum actions to be taken.

As full fire protection and extinguishing gadgets are provided, any risk from fuel stands automatically covered. All motors are kept TEFC (totally enclosed fan cooled). Temperature and Carbon Monoxide control is undertaken by arranging carbon dioxide correct percent. This minimizes the Risk to a very great extent.

- Vehicles bringing in the materials are run at slow speed. It is neatly tied and secured to the vehicles. Guards patrol the entire length, throughout day and night. There is no public traffic here and warning signals are painted on boards.
- For other raw materials, it is a policy to bring the same in small doses and in closed containers. If sundry raw material comes in bags, hooks and other sharp equipment is not to be used on bags or unit loads. Cranes, tackles and forklift trucks are used for unloading and loading.
- Before storage all units are to be inspected for cleanliness and for damage.
- All bags are to be stacked on pallets. All damaged bags are to be repaired a second impermeable bag which would be sealed properly and kept separately for use.
- Dyke walls, smooth sloping floors provided around storage tanks.

7.2.1 Stocking at work place, loading and maintenance of floor area:

- The raw materials are to be placed very near to the feeding point.
- Housekeeping is most important of all dust control methods.
- Simply cleaning of all possible emission sources as quickly as possible.

7.2.2 Work Environment:

Dust and Heat free work environment is maintained in view of workers’ safety, Health and Hygiene. The efforts taken in this respect are:

Table No. 7.1: Work Environment Care.

#	Source	Attenuation by
1.	Scrap Yard	Avoided by adopting smooth roads and yard.
2.	Plant	Avoided by adopting good foundation, good alignment, well lubricated.
3.	Generators	Fitted enclosure and tall stack
4.	Vibrations	Proper sturdy foundation provided for all the machines and equipments to avoid fugitive escapes.
5	Fumes	Closed and covered by swinging roof

7.3 Disaster Management Plan:

Disaster is an undesirable occurrence of events of such magnitude and nature that adversely affects production and also causes damage to the environment. It is therefore, necessary to ensure the safety and reliability of any new plant by way of identification of possible failure and prevent their occurrence before they actually cause disaster or production losses. This is directly proportional to risk.

Risk Assessment:-

Following are the risk assessment techniques:-

- Hazard and operability study (HAZOP)
- Fault Tree analysis (FTA)
- Monte Carlo Simulation
- Safety Audits
- Safety Indicators

HAZOP:

HAZOP is commonly adopted. It is a systematic technique to identify the hazard and operability problems. In this the consequences of the process are assessed and the means available to detect and correct deviation are examined. Thus all credible deviation that could lead to hazardous events or its handling is identified and mitigative measures can thus look for.

No.	Process /Storage	Physical range of consequences propagation
1	Fire	<ul style="list-style-type: none">• Fire due to electrical cable burning/short circuit & propagated further.
2	Earthquake	<ul style="list-style-type: none">• An earthquake can trigger an outbreak of fire because of leakage of gas, spillage of chemicals, short circuit, explosion etc.

7.3.1 Objectives

- To localize the emergency
- To minimize the consequences
- To ensure that following concepts are considered, namely rescue, first aid, evacuation, rehabilitation, spreading the information

7.3.2 Elements of On-Site Plan:

- Assess the size of event
- Plan formulation and liaison
- Action like: Raise alarm, communication within and outside
- Appoint key personnel and deploy. Appoint Controller.
- Emergency Control Center
- Action on site
- Action off-site.

- Alarm and visual signals at strategic point, first alert sent to Incidence Controller.

7.3.3 Organization

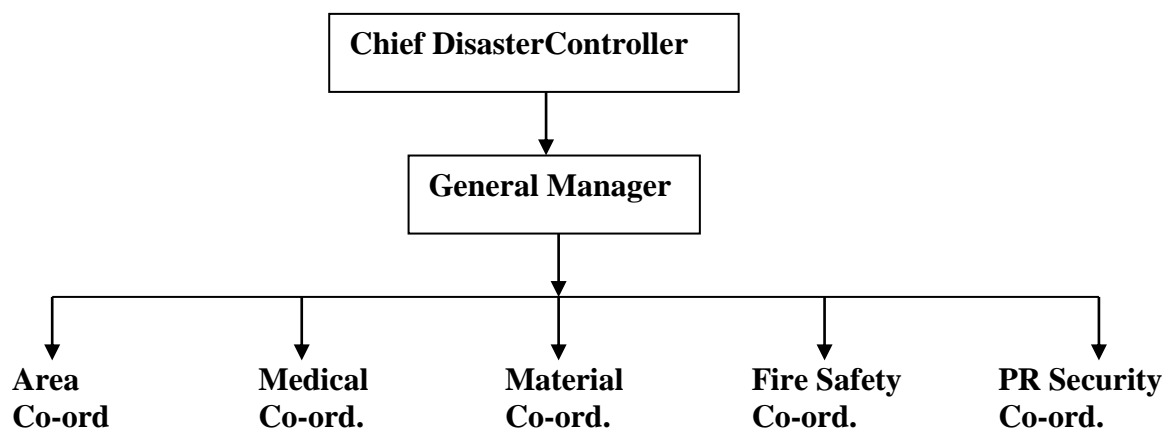


Figure No.7.1: Organization Chart

7.3.4 Duty Allocation

Following types of fire fighting equipments will be made available in the factory

Fire Extinguishers

a. Dry Chemical Powder (Capacity 5 Kg)	05
b. Foam Type (Capacity 9 lit)	05
c. Foam Type (Capacity 15 lit)	01
d. CO2 (Capacity 3.2 Kg)	05
e. CO2 (Capacity 4.5 Kg)	15
f. Sand Buckets	10
g. Neutralizing Agent buckets	05

Chief Disaster Controller (General Manager)

- Take control and declare emergency
- Be there
- Contact Authorities

1 Area Coordinator

- Take steps. Make Emergency shut-down of activities. Put everything in Safe condition.
- Evacuate.
- Commence initial fire-fighting, till Fire Department comes to take up.
- Identify materials requirements and call Material Manager.

2. Medical Coordinator

- Establish Emergency Center. Treat people, Transfer – Remove patients.
- Assign Deploy staff
- Arrange medical supplies

- Summon outside help
- 3. Material Coordinator:**
 - Dispatch necessary supplies
 - Arrange purchases
 - 4. Fire-Safety Coordinator:**
 - Be Overall in-charge for Fire and Safety.
 - Coordinate with Area Coordinator and Direct the Operations
 - Coordinate with City and Other Fire-tenders.
 - 5. PR & Security Coordinator**
 - Remove Crowd
 - Arrange Gate security
 - Contact Police
 - Arrange evacuation
 - Contact outside Agencies if asked.
 - Handle news media
 - Mobilize vehicles
 - Arrange Food, clothing to Officers inside.
 - 6. Emergency Control Center**
 - Adequate Internal phones
 - Adequate external phones
 - Workers Tally
 - Map showing hazardous storages, Fire horns, Safety equipments, Gates and side gates, Assembly points, List of persons.
 - 7. Action on Site**
 - Evacuate. Non-essential people first at Assembly point
 - Persons Accounting
 - Record of Next-of-kins
 - Public Relations
 - 8. Post Disaster Analysis.**
 - Why happened
 - How to avoid in future
 - Whether on-site operations failed? In what respect?
 - How to avoid such failure in future
 - Report to be submitted in detail to Authorities
 - Compensation arrangements if any, commenced?
 - Call suggestions on shortfalls observed.
 - Give rewards openly, pull defaulters individually

7.4 Social Impact Assessment

In such assessment, generally three aspects are considered namely (1) how and to what extent this project will alter the society status, (2) how and to what extent this project will affect the structures of heritage (like monuments, temples etc) that are of emotional local attachments, and (3) how and to what extent this project will solve the delicate issue of oustees.

These points will be dealt herein below, but as a summary it can be stated that

- (1) **Society status** needs an improvement because the unemployed youths are in majority, agricultural employment is limited, and future is bleak without such Industrial developmental efforts.
- (2) **Heritage** structures are too far away as to get any impact and
- (3) This site being already in the possession of Proponents and made Industrial, question of **Rehabilitation** does not arise.

Society Status

The earlier Chapter Three serves to describe in details the existing Social Status in great details as to **Population** (decadal growth, sex ratio, village sizes, literacy rate), **Transportation & Communication** (bus stop or a railway station, road network, surfacing), **Public Health** (Medical facilities, Primary Health Centre, Primary Health Sub-centre, dispensaries, attending Registered Practitioners, drinking water), **Land Use Pattern** (irrigation area, land cultivable but waste and land not available for cultivation), **Agriculture** (Kharif), **Animal Husbandry**, employment, and industries. It is stated at all the levels like the State, District, Tehsil and the Study Area of 10 km radius around. The needs of developmental efforts are arrived and on that background, this Project may be seen.

7.4.1 Employment & Wages:

Table 7.2: Status of working population in the study area

Name	Total Workers	Main workers				Marginal Workers	Non Workers
		Cultivators	Agricultural Laborers	Household Industry	Others		
Total	124382	11473	10947	3921	83560	14481	218378

- Of the total main workers cultivators (10.44%) and agricultural labour (9.96%) together constitute 20.40% of the total main workers, whereas 76.03% of main workers are engaged in others category. It reflects that 76% of the main workers in the study area are engaged in other category such as manufacturing, processing, servicing and repairs, trade and commerce and agricultural sector has absorbed only 20% of the total workers.

All this leads to one conclusion that industrialization has to be stepped up

- To provide more livelihood.
- To provide Male employment with Women participation, for economic independence.
- To improve agriculture by increasing the spending capacity of the people by other avenues and diverting the gains.
- To improve livestock census per sq. km by utilizing employment gains.

New Industrial Trend

Due to the desire of the State Government to provide some additional means of livelihood to the people by way of potential employment in industries, a number of factories have lately commenced considering this area for sitting. Further industrialization is necessary.

Heritage:

From this center of activity we do not have in proximity Archaeological, Monument, Airport, Ports, National Park, Religious places, Resorts, Other Historical places. As all these sensitive points are well outside the influence zone and as nature of production is not complex or chemical oriented, the proposed activity is not capable of creating any significant effect, let alone adverse.

Table 7.3: Heritage

Heritage	Distance (Km)
Rajur (Ganpati)	25
Dattadham (Jalna)	15
Matsyodari Devi Ambad	25
Jamb Samarth	30
Guru Ganesh Samadhi	12

(1) Rehabilitation:

No rehabilitation is necessary; the proposed expansion is within existing MIDC premises.

The proposal is unique in the sense that –

1. The land is of Government MIDC
2. The land is already in possession
3. The extent of required land is limited
4. The land is not prime agricultural land
5. There is no ousters or displaced person here
6. No rehabilitation or resettlement is needed on the above background.

7.5 Conclusion:

Having analyzed the Project so far, in this Chapter it is shown that this project will meet the public acceptability (now and in future) as the proponent has kept cordial and pollution-free relations around. Whatever are the possible risks due to unforeseen act or events are apprehended now and a Management Plan prepared. Any damage to structures of Heritage importance can create sensitive situation. This is studied and results entered. Society needs such development based on the statistics assembled. It is seen that no R & R efforts are freshly required as the land is in peaceful possession of the Proponents.

CHAPTER 8 - PROJECT BENEFITS

It is seen that the Project is aimed to fulfill the objective of Sustainable Development. It will improve economic status of the nearby area in the district.

8.1 Improvements in the physical infrastructure

This Project will improve the physical infrastructure of this area:

- As roof rain harvesting and recharging is proposed, there will not be any incremental run-off causing floods downstream. It will improve the water table in the long run. The nearby nalla is trained by good civil engineering practice and hence physical infrastructure will improve.
- The industry is dependent on raw materials and helping chemicals, which arrives by road. The finished goods will be dispatched by road. All the labour force will come by road. The proponents will assist the administration to maintain the roads in good conditions. This improved physical infrastructure will be an added facility to the community for surface transport.
- Greening drive in the premises will give a pleasant look to the land. It will absorb some portion of the CO₂ produced by fuel burning (utilities) as well as created by induction furnace (process). It is proposed to use treated domestic wastewater for green area development. Canopy of trees will arrest dust fugitive SPM as well as the noise.

8.2 Improvements in the social infrastructure

The Project will aid in the improvement of the social infrastructure of this area:

- In the District Similar industries are already running their units over the years. These are not only running with efficiency but are running with no disturbance to the local people. Local people have even encouraged the expansion of such mills for production. The same is the case for diversification.
- PP will employ sons of the soil without discrimination, wherever feasible. The Proponent's management keeps the transparent account.
- Education level goes along with flow of funds and avenue of livelihood. Dependence on Government subsidy also goes along with political stability of the area. The level of education and literacy (especially rural and women) is very poor, needing improvement. This activity by this Proponent will certainly play a catalytic role in this.
- Likewise the health level goes along with flow of funds and avenue of livelihood. Dependence on Government institutes like PHC (Primary Health Centre) also goes along with political stability of the area. The level of health and medication (especially children and women) is very poor, needing improvement. This activity by this Proponent will certainly play a catalytic role in this.
- Health awareness and economic independence may also help in Family Planning decision-making.
- Living in harmony is an important aspect of the society. This can happen only if all the components are comfortably placed. Persons engaged in their respective

vocation and accruing job satisfaction leads to this. This will become possible by this venture.

8.3 Employment potential – skilled, semi-skilled and unskilled

The industry and its supporting activity need many types of people right from manual to managerial strength, in a pyramid. The raw material growing may need unskilled workers with people on tractors and tractor repairers as skilled ones. So in manufacturing activity all three types i. e. skilled, semi skilled and unskilled people are required. The overall potential including the garages, loading-unloading actions, eateries, small repair shops, etc is essential. The local people can get a good share out of this. If the second generation local people acquire that skill, they too will be able to fill the gap and accrue benefit of higher jobs.

8.4 Other tangible benefits

Both tangible and non-tangible benefits will result from this activity and many of those are described above. Apart from direct employment, many other benefits will accrue like

- Flood control by rain-water arresting and harvesting
- Groundwater level enhancing by recharging
- Time saving by quicker transport
- Aesthetics improvement by general greening with emphasis on biodiversity
- Strengthened democratic set-up will bring weightage to secure better school-subsidy and health-institutes
- Improved safety-security in surrounding with better Law and Order.

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CHAPTER 9 - ENVIRONMENT MANAGEMENT PLAN (EMP)

9.1 Need:

The economic development of any country depends mainly on the core sector development such as infrastructure, agriculture, etc. Iron and steel products form the backbone of infrastructure development. This type of plant is likely to be more viable in view of present situation, when the steel has demand in the market and global inflow of money is permissible. This has a foreign-exchange saving potential.

9.2 Objectives:

- a) To define the components of environmental management..
- b) To prepare an environmental hierarchy.
- c) To prepare a checklist for statutory compliance.
- d) To prepare environmental organization.
- e) To prepare a schedule for monitoring and compliance.
- f) To establish a watchdog committee voluntarily with an ultimate aim to get ISO 14000 certification.

9.2.1 Environment Components:

Om Sairam Steel & Alloyed Pvt. Ltd. is aware that environmental management is not a job, which can be handled without a careful planning. The success lies if three components are simultaneously present viz. (1) management support, (2) efficiency of the environment management cell and (3) acceptability of resulting environmental quality, both by SPCB and by public. A structure of this plan and hierarchy of process flow for environmental management is prepared and enclosed as logics, which is self-explanatory. This industry will adopt this structure and hierarchy, which is akin to principles and practice.

Air Environment:

- a) Monitor the consented parameters at ambient stations.
- b) Monitor the work zone at various stations to satisfy the corporate requirements for health and environment.
- c) Maintain a record of running of DG (diesel generating) sets
- d) Monitor the stacks or vents fitted to sections of raw material, manufacture, thermal and DG power plants.

Water Environment:

- a) Keep record of input water every day for quantity and periodically of quality.
- b) Measures are taken to segregate the sub-streams of effluent as per their characterization.
- c) Water conservation is accorded high priority in every section of the factory.
- d) Keep record of wastewater returned back to process, to utilities and to gardening, both the quantity and quality details.

Aesthetic (Noise & Odour) Environment:

- a) Monitor the ambient noise level and work zone noise level to conform the stipulated norms.
- b) Creation of awareness for noise attenuation and mitigation program.
- c) Monitor the ambient Odour level and work zone Odour level by sensing.
- d) Creation of awareness for Odour attenuation and mitigation program

Biological Environment:

- a) Special attention is planned to maintain green belt in and around the factory premises.
- b) Adequate provisions are made to facilitate daily watering of all plants and lawns. Special attention provided during summer to ensure that the green belt does not suffer from water shortage.
- c) Development & maintenance of green belt to be considered as a priority issue.
- d) No outside soil is brought for any building/ greenery developments.

Work-zone Comfort Environment:

- a) Monitor the work zone temperature levels.
- b) Monitor the work zone humidity.
- c) Examine the health of workers and keep record.

Socio- Economic Environment:

- a) The operators and workers are trained in various aspects of ESH (Environment, Safety and Health).
- b) The managers and officers involved in Environment Management Cell shall undergo refresher workshop and up gradation of information on various environmental issues.
- c) The industry shall help in promoting the activities related to environmental awareness in nearby villages/ neighbours.
- d) The industry shall help in promoting local people for livelihood commensurate with their will, skill and abilities.

9.2.2 Environmental Monitoring Schedule:

A judgment can become truncated if it is not scientifically supported. This work is done by an appropriate monitoring which is a technique of drawing a sample and deriving inferences from the same for knowledge and improvements.

A scheme for this is already prepared and presented in chapter six above. Watch-dog committee will also help in examining this physically for organolyptic tests.

A judgment can become truncated if it is not scientifically supported. This work is done by an appropriate monitoring which is a technique of drawing a sample and understanding from it the universe. The sampling station, the parameters and frequency is of extreme importance as also the careful analysis, reporting and interpretation. The schedule decided for a small activity like that of this industry is as given in chapter six:

9.2.3 Schedules:

There will be three facets to design and follow the schedules viz.: (A) for compliance of responsibilities, (B) for day-to-day operation and management of ETP and ECE, and (C) for routine environmental monitoring, to assess the impact and take timely warning. The schedule:

Daily Compliance:

1. Take the meter readings - initial and final, for checking the water consumption.
2. Maintain the electricity consumption record for pollution control.
3. Monitor ambient air periodically as per Consent.

Monthly Compliance:

1. Monitor the emission sources through the competent authority and submit the analysis reports to the board.
2. Monitor ambient/work zone noise levels & ensure conformance to standards.

Quarterly Compliance:

1. Monitor the ambient air quality at upwind and downwind locations of the factory.
2. Review the Water Reuse performance.

Yearly Compliance:

1. Carryout "Environmental Audit Statement" of various environmental aspects, review the environmental policies with the help of experts and make the up-gradation /changes accordingly.
2. Submit the "Environmental Statement" to the State Pollution Control Board in Form V under Rule 14 of the Environment (Protection) Second Amendment Rules 1992 of the Environment (Protection) Act, 1986.
3. Renew the Consent to Operate under the Water and Air Acts.
4. File the Cess returns to the State PCB under the Water (Prevention and Control of Pollution) Cess Act, 1977.
5. Renew the Hazardous Waste Authorization under sub-rule 3 of the Hazardous Waste (Management and Handling) Rules, 1989.

Consent Compliance

This industry undertakes to comply the conditions prescribed by the Consent. In this direction, the following discipline will be followed:

Table No.9.1: Consent Compliance

#	Condition Regarding	Mode of Compliance
1	Validity Period	Keeping a watch, Application for renewal will be submitted in advance
2	Production Quantity	Not to exceed the permitted quantity. Feed will be adjusted to recovery
3	Quantity of Effluent	To be measured daily and in-plant control. Not to exceed any time
4	Quantity of Sewage	To be measured periodically. Not to exceed
5	Total water input	To be measured daily. Repair meters. Not to exceed. Make break-up as per usages. Fill monthly Cess returns. Pay as per assessment
6	Quality of Effluents	By running treatment units in correct fashion. Monitor. Report
7	Disposal of treated effluent	Not over application. No percolation, no spillages. Monitor.
8	Fuel Quantity	Not to exceed permitted quantity
9	Emission System	Regular running, monitoring & maintenance
10	Ambient	Keep monitoring.
11	Noise levels	Check foundation for vibrations, Tree plantation
12	Solid Waste	Quantity to be measured & record kept.
13	Environ. Audit	To be complied every year before 30 th Sept.
14	Inspections	Inspection Book to be opened. Instructions given by SPCB visiting officer to be complied and reported.

For above compliance Action will be taken by the Cell under the Managing Director himself.

9.2.4 Watch-dog Committee:

A high power watch dog committee will be set up which will have a power of sudden spot inspections, checking of documents and listening to complaints if any. This committee will supervise over the monitoring and environmental management cell as may be necessary, generally over the following facets of works:

1. Permit management
2. Construction management
3. Treatment and emission management
4. Transport management
5. Disposal management
6. Monitoring
7. Documentation
8. Law enforcement

9.2.5 Construction Phase Management:

Site Preparation:

There is no need of site preparation, it is expansion project in existing premises. No major leveling operations are envisaged. During dry weather conditions it is necessary to control dust nuisance created by excavation and transportation activities in minor amount. However, because the proposed built-up area is of considerable low requirement, this problem should not be insurmountable, or else some water sprinkling will be resorted to.

Sanitation:

The construction site shall be provided with sufficient and suitable toilet facilities for construction workers to allow proper standards of personal hygiene. These facilities shall be connected to a STP and maintained to ensure minimum or no environmental impact.

Noise:

Though the noise effect on the nearest inhabitants due to construction activity will be negligible (being away) it is advisable that on site workers using high noise equipment adopt noise protection devices like earmuffs.

Construction Equipment and Waste:

It shall be ensured that both gasoline and diesel powered construction vehicles are properly maintained to minimize smoke in the exhaust emissions. The vehicle maintenance area shall be located in such a manner to avoid sources by accidental spillage of oil. Unauthorized dumping of waste oil should be prohibited. Wastes shall be disposed off at an approved site.

Storage of Hazardous Material:

The following hazardous materials if used for site preparation and construction activity, shall be stored as per international standards.

1. Explosives for rock blasting (This will not be permitted)
2. Petrol and diesel
3. LPG
4. Painting materials
5. Asbestos products

Site Security:

Construction site is a potential hazardous environment. To ensure that the local inhabitants and stray cattle are not exposed to these hazards, the site shall be secured by fencing and manned entry points. It will be fully illuminated.

Land Environment:

This is an expansion project, so there is no need of major construction work. There is only fabrications work. An inventory shall be prepared of standing trees and bushes of significance. To prevent unauthorized felling of trees by construction workers for their fuel needs it will be ensured that the contractor provides fuel to them.

9.3 Conclusion:

Commencing from Introductory, this EIA study has reported the details on Proponents, Project, natural and manmade facets of background environment, how and how much residual pollution will be added after prevention, abatement, control and mitigation. Whether the overall impact will be adverse, beneficial or marginal is found out by two accredited systems. This, however, is required to be manned properly. Unless an EMP is prepared in advance, as like production campaign the environmental protection will not automatically happen. Such EMP, and its implementation with commitment from the higher management is stated. This Study when scrupulously followed, will meet the objectives of fulfilling the legal requirements and not causing any hardships to people.

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CHAPTER 10 CONSULTANTS ENGAGED

This EIA report is prepared on behalf of the proponents, taking inputs from proponent's office staff, their R & D wing, Architects, Project Management Professionals etc. by Environmental Consultants M/s. Ultra-Tech Environmental Consultancy & Laboratory, Thane, Mumbai, who have been accredited by QCI-NABET vide official memorandum of MoEF S.N. 93 of LIST 'A' of MoEF - O.M. No. J 11013/77/2004/IA II(I) dated September 30, 2011, S. No. 158 of list of Consultants with Provisional Accreditation* (Rev.31A) of dated 15th June 2015.

M/s Ultra-Tech Environmental Consultancy & Laboratory:

Ultra-Tech Environmental Consultancy & Laboratory [Lab Gazetted by MoEF – Govt. of India] not only give environmental solutions for sustainable development, but make sure that they are economically feasible. With innovative ideas and impact mitigation measures offered, make them distinguished in environmental consulting business. The completion of tasks in record time is the key feature of Ultra-Tech. A team of more than hundred environmental brigadiers consists of engineers, experts, ecologists, hydrologists, geologists, socio-economic experts, solid waste and hazard waste experts apart from environmental media sampling and monitoring experts and management experts, strive hard to serve the clients with up to mark and best services.

Ultra-Tech offers environmental consultancy services to assist its clients to obtain environmental clearance for their large buildings, construction, CRZ, SEZ, high rise buildings, township projects and industries covering sugar and distilleries from respective authorities. Ultra-Tech is in the process of getting QCI-NABET final accreditation for its EIA organization.

Ultra-Tech also provide STP/ETP /WTP project consultancy on turn-key basis apart from Operation and Maintenance of these projects on annual contract basis. Also, having MoEF approved environmental laboratory, Ultra-Tech provide laboratory services for monitoring and analysis of various environmental media like air, water, waste water, stack, noise and meteorological data to its clients all over India and abroad.

Functional area experts and assistance to FAE involved in the EIA study for **M/s. Om sairam Steel & Alloyed Pvt. Ltd.**, at Additional MIDC, Phase –II, Plot No: F-1,2,3,8,9,10 and Survey no.46&63, Daregaon, Jalna Dist : Jalna Maharashtra . is as follows;

FUNCTIONAL AREA EXPERTS IN THE EIA:

Table No. 10.1: List of Functional Area Experts

S. NO.	NAME OF SECTOR	NAME OF PROJECT	NAME OF CLIENT	NAME OF EIA COORDINATOR	FUNCTIONAL AREA EXPERTS INVOLVED	
					FA	NAME/S
1.	Metallurgical 3(a)	Secondary Metallurgical Project	M/s. Om sairam Steel & Alloyed Pvt. Ltd. , at Additional MIDC,	Mr. Santosh Gupta Associates: Ms. Pradnya Parkhi	AP	Mr. Shekhar Tamhane Associate: Ms. Pradnya Parkhi
					WP	Mrs. Deepa Tamhane – Karnik

S. NO.	NAME OF SECTOR	NAME OF PROJECT	NAME OF CLIENT	NAME OF EIA COORDINATOR	FUNCTIONAL AREA EXPERTS INVOLVED	
					FA	NAME/S
			Phase –II, Plot No: F-1,2,3,8,9,10 and Survey no.46&63, Daregaon, Jalna		EB	Dr. T. K. Ghosh Associate: Ms. Bharti Khairnar
					SE	Ms. Kishore Wankhede Associate: Mr. Shrikrishna Kulkarni
					SHW	Mrs. Deepa Tamhane – Karnik Associate: Ms. Pradnya Parkhi
						LU
					RH	Dr. Ravindra Kode Associate: Ms. P. Parkhi

LABORATORY FOR ANALYSIS:

Table No. 10.2: Laboratory Details

NAME OF LABORATORY	SCOPE OF SERVICES	ACCREDITATION STATUS
ENalyse Recognized by Ministry of Environment and Forest (MoEF), Govt. of India ISO 9001: 2008 and OHSAS ISO 18001: 2007 Certified Company	Monitoring and Analysis of: 1.Ambient Air Quality Monitoring 2.Ground and Surface Water Quality Monitoring 3.Noise Level Monitoring and 4.Soil Quality Monitoring 5.Metrological data collection	Gazetted by MoEF- Govt. of India