EXECUTIVE SUMMARY

1.0 INTRODUCTION

JSW Ispat Steel Limited (JSWISL) is contemplating to expand the integrated steel plant to 5.0 MTPA from existing 3.0 MTPA at Geetapuram, Dolvi in Raigad (MS). The existing steel plant is based on the gas based Directly Reduced Sponge Iron (DRI) - Blast Furnace-CONARC–Ladle Furnace & VD/VOD - Continuous Casting – Rolling Mill (HSM) route. The expansion shall be based on proven BF- route.

2.0 PROJECT DESCRIPTION

The production facilities after the expansion shall be as shown in **Table-ES.1.**

Table ES.1: Expansion of JSWISL (existing 3.0 MTPA to 5.0 MTPA)

Sl. No.	Technological facility	Existing Capacity	Proposed Expansion	Plant Capacity After Expansion
1.	DRI (Gas based Mega Module)	1.2 MTPA	0.8 MTPA by augmenting	2.0 MTPA
2.	Pellet Plant	-	4.0 MTPA	4.0 MTPA
3.	Coke Ovens including By-product plant	1.0 MTPA (under Implementation)	1.0 MTPA (New)	2.0 MTPA
4.	Sinter Plant	2.8 MTPA	3.2 MTPA	6.0 MTPA
5.	Blast Furnace including Pig casting	2.0 MTPA	1.6 MTPA	3.6 MTPA
6.	SMS (CONARC)	3.0 MTPA	2.2 MTPA (By Augmenting the existing facilities)	5.2 MTPA
7.	Ladle Furnace(LF)	2x200 t Twin shell	1x205 t	2x200 t + 205 t
8	VD/VOD	1x200t	1x205 t	1x200 t + 1x205 t
9.	CSP(HRC Coil) Thin Caster-cum-Hot Strip Finishing Train	3.0 MTPA	0.5 MTPA (By Augmenting)	3.5 MTPA
10.	Conventional Slab Caster	-	2x1 strands	2x1 strands
11.	Plate Mill	-	1.5 MTPA	1.5 MTPA
12.	CRM	-	1.0 MTPA	1.0 MTPA
13.	Galvanizing	-	0.6 MTPA	0.6 MTPA
14.	Electrical Steel CRGO	-	0.4 MTPA	0.4 MTPA

Sl. No.	Technological facility	Existing Capacity	Proposed Expansion	Plant Capacity After Expansion
15.	Tin Plate Mill	-	0.4 MTPA	0.4 MTPA
16.	Colour Coating Plant	-	0.5 MTPA	0.5 MTPA
17.	Lime /Dolo Plant	600 TPD	1200 TPD	1800 TPD
18.	Oxygen Plant	1600 TPD	2000 TPD	3600 TPD
19.	Captive Power Plant	-	300 MW (from surplus gases of BF & CO)+55 MW from WHRB of various unit	300 MW (from surplus gases of BF & CO) +55 MW from WHRB of various unit

3.0 DESCRIPTION OF THE ENVIRONMENT

3.01 Introduction

The study area has been taken as 10.0 km radius around the existing plant at Dolvi. The baseline environmental data was generated during summer season (March to May, 2011) for meteorology, air quality, water quality, noise levels and soil characteristics, by setting up a number of monitoring stations. Further, existing ecological and socio-economic features were also studied. The collected data were analysed for identifying, predicting and evaluating environmental impacts. The maximum anticipated impacts were assessed and based on these an environmental management plan has been drawn.

3.02 Meteorology

A meteorological station was set up at JSWISL Office building. In summer season overall, the predominant wind directions for March 2011 –May 2011 were WNW (prevailing for 21.72% of the time), NW (18%), SSE (16.46%), S (9.70%), W (6.35%) and SW (6.17%). Calm conditions prevailed for 1.77% of the time. The wind velocity was mostly between 0.5 to 10.5 m/s.

3.03 Air Environment

Ambient Air Quality (AAQ) was monitored at nine monitoring stations. The results are compared with National Ambient Air Quality Standards (NAAQS) of Ministry of Environment & Forest (MOE&F) vide notification GSR 826 (E) dated Nov 16, 2009. The results of PM 10, PM 2.5, SO_2, NOx and CO at all the monitoring stations (Table-ES.2) were found to be well within the respective permissible limit for industrial, residential, rural and other areas.

Table ES.2: Summarise Values of AAQ Monitoring during summer season

Parameters		Results (µg/m^3)								
		Gadab Village (A1)	Dolvi Village (A2)	Navegaon Village (A3)	Vadkhal Village (A4)	Shirki Village (A5)	Vashinaka Village (A6)	Dharamtar Village (A7)	Ghaswad Village (A8)	Kusumble Village (A9)
PM 10	Max	96	85	98	96	46	94	91	45	58
	Min.	44	33	58	29	20	39	38	21	28
	Avg.	75	63	78	49	33	61	62	31	48
PM 2.5	Max	27	23	33	25	20	33	31	17	20
	Min.	21	15	25	18	10	28	22	12	12
	Avg.	24	19	29	21	16	31	26	14	20
SO_2	Max	8	8	7	9	6	10	11	6	6
	Min.	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Avg.	-	-	-	-	-	-	-	-	-
NO_X	Max	22	24	23	21	22	24	24	19	20
	Min.	10	10	13	9	8	10	10	10	9
	Avg.	14	15	18	13	14	15	17	13	15
CO	Max	2235	2471	2514	2151	1825	2587	2351	1846	1536
	Min.	1388	1425	1425	1248	1258	1354	1248	1235	1358
	Avg.	1700	1722	1704	1666	1510	1961	1604	1460	1447
Benzo (a) Pyrene (BaP) ng/m^3	Max	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Min.	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Avg.	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

3.04 Water Environment

Ten surface water and ground water samples were collected and analysed**.** All the parameters in different surface waters were within the CPCB norms for Classes C and D of surface water.

Results of ground water analysis were compared with IS: 10500 (IS: 10500; 1991, amendment no.1, 1993 - norms for drinking water) and all the parameters are well within the prescribed limits.

Quality of all the surface water locations is within the norms for Class A, except SW1 (Amba River upstream of plant) and SW2 (Amba River downstream of plant) where in

the samples the BOD levels were exceeding the norm for Class C (3mg/l max.). However, the water analysis reports indicating the tidal impacts on SW1 & SW2 samples.

3.05 Soil

Five samples of topsoil were collected and analysed. In the study area the soil pH is near to neutral and varied from 6.5 to 7.4. The test result of pH from different locations indicates that there is no acidic impact on soil due to the industrial activity.

In the tested soil samples most of the nutrients are available in the low to high concentration ranges. Organic carbon was found to be medium to high concentration ranges. Available Phosphorus and Nitrogen is found to be in low to medium concentration ranges, whereas availability of Potassium is found to be low to high ranges. As the major nutrients are not showing any major deviation among the tested soil samples it can be concluded that there is no impact on nutrient contents of soil due to industrial activity.

3.06 Ambient Noise

The noise monitoring was done at ten locations. The results show that near Near Goa Gate (N2) & Dharmatar Alibag road near Port Junction (N9) both day and night time noise levels are well within the norm for Industrial area. At commercial area the values are within the norm for day & night time. In residential areas all values are well within the prescribed norm.

3.07 Ecological Features

The species commonly found around human settlement are mostly of economic importance. Among the fruit trees, which are common are Mango, Drumstick, Jackfruit, Bel, Jamun, Coconut, Areca-nut, Banana, Papaya, etc.

The study area is poor in wildlife as there are few good forests in the region and that too away from the study area. In the study area, Hare, Jackals and foxes are seen adjacent to the rocky hills. Langurs and Bonnet monkeys are present in the forest areas as well as in the villages. Wild Boar is found in scrub jungle. Of the reptiles Rat snake, Cobra, Vipers and Phorsa are seen. There is no good forest in the study area due to which wild fauna are poorly represented.

3.08 Socio-Economic Environment

Basic Socio-economic Conditions and Land-use in the study area are as follows:

- The social structure of the study area is dominated by rural area culture, on one hand and urbanized on the other.

- Literacy level among the respondents is average.
- Educational facilities are not job-oriented which is required to improve skill-diversification among people, specifically, local youth so that they get jobs in the small-scale industries in the vicinity of JSWISL.
- The employment rate is moderate. Agriculture still plays an important role in rural economy. However, many people are engaged in service and other activities.
- People are having very small plot of land holding. The land is not enough to meet their needs and therefore rural people of the area prefer to work in construction related activities.

3.09 Baseline Status of Existing JSWISL plant

Stack Emissions

The stack monitoring of major units was carried out during the study and results indicate that values of PM are within the norm of 150 mg/Nm3 as stipulated by MPCB for various units of the Plant.

Work –zone emissions

Work zone SPM values were found within the norms of Factory Act.

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS

4.01 Impact During Construction

All of the major construction activity will be limited within the existing JSWISL plant premises having all infrastructure facilities. As such no large-scale construction activity covering a large area and contributing considerable pollution is expected. Further, the impact of such activities will be temporary and will be restricted to the construction phase only.

4.02 Operational Phase Impact

During operation of the plant, environmental releases in the form of air emissions, wastewater discharges, solid waste, noise, etc, may affect air, water, land and ecological environment directly. In addition to the above primary impact, some indirect impact on the surrounding socio-economic environment may also take place. These are mentioned below in brief.

Air Environment

The principal impacts on ambient air quality due to operation of the proposed units will be due to emissions from the stacks of the proposed units and emissions of fugitive dust from the iron ore and coal handling areas. The predicted maximum contribution of all the proposed major stacks to GLC is 12.96 ug/m3 for PM10, 3.08 ug/m3 for SO2 and 7.58

ug/m3 for NOx respectively. The nearest AAQ monitoring station where maximum GLC values have occurred is in southeast direction close to plant. The monitored background mean value for AAQ in predominant direction is 75 ug/m3 for PM 10, 8.0 ug/m3 for SO_2 and 14.0 ug/m3 NOx_x for summer season respectively. The predicted contributions of different pollutants from the proposed steel plant when added with the monitored existing background levels in predominant direction indicate that the maximum concentrations will be 87 ug/m^3, 11.8 ug/m^3 and 29.58 ug/m^3 for PM-10, SO_2 and NOx respectively. The concentration is within the norms of Industrial, Residential, Rural & Other Area norms. Since the values are much less then the norms for industrial areas, no significant impacts are expected from the proposed expansion of steel plant provided steel plant authority incorporates pollution control measures indicated in the report and implemented holistically. From the results it is observed that impact from operation of its rated capacity of 5.0 MTPA will be within the norms of ambient air quality.

Habitation centers such as Pen and Alibag are about 8 and 22 km away from plant in reference direction respectively and the levels of air pollutants expected are much less. Hence no significant impact is envisaged.

Impact on Water Environment

Water Usage and Effect of Water Withdrawal

The requirement of make-up water for the proposed expansion will be 2590 m3/h. This will be met from dam on Amba River at Nagothane KT Bhandara. No impact on ground water is envisaged since no ground water will be drawn by JSWISL for the proposed expansion programme.

Surface Water Pollution

JSWISL proposes maximum recirculation/reuse of waste water in normal circumstances. The anticipated wastewater generation after capacity expansion will be about 50 m3/hr (including floor washings, etc), which will meet the statutory norm and will be used for green belt development. However, during monsoon season JSWISL may be allowed to discharge treated wastewater of 50 m3/h (max) outside the plant premises through storm water drains.

Impact of Solid Waste

The major solid wastes expected to be generated from the various facilities of integrated steel plant are as follows:

Table ES.3: Solid Waste Generation and its probable Re-use

Sl. No	Solid waste	Generation tpa @ 5.0 MTPA	Proposed disposal
1	**Slag**		
a.	Iron Making slag	1,080,000	Granulated partially used in slag grinding unit within plant and remaining sold to

Sl. No	Solid waste	Generation tpa @ 5.0 MTPA	Proposed disposal
			outside.
b.	Steel making slag	1,000,000	Additional slag will be generated. Partly will be used after processing in slag atomizing plant. balance in filling low lying area, boulder soling, internal road making etc
2	**Sludge**		
a.	Iron making / Filter plant sludge	70,100	Used in Pellet and Sinter Plants after dewatering
b.	SIP process water sludge	73,300	Used in Sinter plants after dewatering
3	**Mill scales**		
a.	Steel making shop	26,000	Used in CONARC
b.	Rolling mills	41,500	Used in Sinter plants
c.	SIP Fines	439,400	Used in Sinter plants
4	**Dusts**		
a.	Flue dust from Blast furnace	62,100	Used in Sinter plants
b.	Dust from bag filter of CONARC	87,700	Used in Sinter plants
c.	CONARC de-dusting dust	2,800	Used in Sinter plants
5	Lime / Dolo dusts	-	Lime + Dolo fines converted to briquettes and used in CONARC and Sinter plants

Impacts on Noise Levels

During plant operations noise generated will be close to the compressors and blowers and as a result will be confined within plant boundary and will not have any impact outside the plant boundary. In high noise work-zone, protective measures as given in Environmental Management Plan will be followed to minimize the impact on workers.

Impact on Ecological Features

Since the change in ambient air quality due to emissions from the proposed capacity expansion will be small, vegetation in study area will not be damaged. The waste water discharge from the plant will be minimal and will meet the surface water discharge norm. Thus there will be no impact / positive impact on the ecological components of surface water bodies in the area.

5.0 ENVIRONMENTAL MANAGEMENT PLAN

5.01 Air Pollution Management

All stack emission will be designed on PM emission of 50 mg/Nm3 from pollution control equipment. To reduce fugitive dust emission due to handling of iron ore, coal, dust extraction and dust suppression systems will be installed at appropriate locations. Plain water type dust suppression system will be provided at the all around the coal/ raw material stockpiles. The dust suppression systems will consist of water sprinkling systems.

Following are the pollution control equipment to be provided in the expansion project.

Table-ES 4: List of Pollution Control Equipment

SN.	Production Unit/ Facilities	Proposed Emission Control Devices		Design Target
		Non-Point Sources	Point Sources	
1.	Coal Handling / Coke Sorting Plant	- Dust suppression: water sprinkler & DFDS - DE system bag filter based: Coal crusher house / Coke sorting plant.	-	Dust outlet: $\leq$ 50 mg/N m^3 Work zone Dust level: < 5 mg/ m^3
2.	Raw Materials Handling Section	- Covered conveyor - Dry Fogging - Water sprinkling - Bag filter - DE system	DE Stacks	Dust outlet: $\leq$ 50 mg/N m^3 Work zone Dust level: < 5 mg/ m^3
3.	Coke Oven Battery	- On-main charging by HPLA - Coke side dust extraction	Combustion Stack	Fugitive Emissions: 5% PLD 1% PLL 4% PLO BaP: Work Zone (Battery Top) : $\leq$ 5 ug/m^3 Stack emissions: SPM $\leq$ 50 mg/ m^3 SO_2 $\leq$ 800 mg/ m^3 NOx $\leq$ 500 mg/ m^3
4.	Sinter Plant/ Pellet Plant	- Raw feed proportioning building, Sinter Cooler, Air Cleaning by DE System comprising of ESP	- Waste flue gas cleaning by ESP - Sinter Process De-dusting by ESP - Sinter process: low NOx burners	Dust outlet: $\leq$ 50 mg/N m^3 Work zone Dust level: < 5 mg/ m^3
6.	SIP Plant	- Raw material preparation & Handling centralized de-dusting facility bag filter	- MIDREX Shaft Feed end scrubber. - Product screening end Bag Filter	Dust outlet: $\leq$ 100 mg/N m^3 Work zone Dust level: < 5 mg/ m^3
7.	Blast Furnaces	- BF Stock House by DE system - BF Cast House by DE system: ESP	- BF Stove Stack - BF Stove : low NOx burners	Dust outlet $\leq$ 50 mg/N m^3 Work zone Dust level: < 5 mg/ m^3

SN.	Production Unit/ Facilities	Proposed Emission Control Devices		Design Target
		Non-Point Sources	Point Sources	
8.	Steel Melting Shop	SMS Material Handling - DE system by Bag filter	- Centralised secondary fume extraction system for CONARC / LFs with Bag filter.	Dust outlet $\leq$ 100 mg/N m^3 Work zone Dust level: < 5 mg/ m^3
9.	Lime & Dolo Plant	- Lime Plant Raw Material Bunker Building - De-dusting by Bag Filter. - Lime sizing plant – De-dusting by Bag Filter.	Waste flue gas through Bag filter (fabric)	Dust outlet $\leq$ 50 mg/N m^3 Work zone Dust level: < 5 mg/ m^3
10	HSM/Plate Mill Reheating Furnace	-	Low NOx burners	Dust outlet $\leq$ 50 mg/N m^3
11	Power Plant	-	- Low NOx burners	Work zone Dust level: < 5 mg/ m^3

5.02 Water Pollution Management

The prevention and control of water pollution aim at conserving make-up water by recycling the wastewater after treatment. During the operation of the plant, three major categories of wastewater, viz. blow down water from the cooling tower, slurry water and sanitary waste water streams would be generated. Efforts shall be made to reuse most of the water in the plant itself.

Thus, proposed plant will recycle water to the maximum extent possible. However in abnormal cases periodically small quantities (50 m3/h max) of effluents if and when required shall be discharged to prevent build up of excess dissolved solids through stabilization in pond and will be well within the stipulated norms of quality.

Efforts will be made to harvest rainwater in the plant. Run-off water from the office areas, shop roofs will be collected and used for future use.

Oil sewer will collect water from areas where there are possibilities of contamination by oil (transformer yard, fuel & lubricating oil storage areas, and workshop) and the drains from such areas will be routed through an oil-water separator. The collected oil shall be sold to re-refiner approved by MPCB/CPCB.

All storm water drains from the raw materials and solid waste handling areas will be routed through garland drains into catch pits of sufficient volume to settle out suspended solids present in the storm water run-offs. The clear water will be discharged into natural drainage channels. This type of effluent is anticipated only in monsoon season.

The sewage from the Plant and Canteen will be treated in STP. The treated sewage will be diverted for irrigation of green cover inside plant premises.

5.03 Solid Waste Management

The principal solid waste produced by any steel plant is slag, scrap, scale and dust. The dust from dust catcher unit of BF and SMS section will be recycled to the extent possible in the sinter plant itself.

SMS slag will be treated and shall be partly used in BF for its basic property. A part of SMS slag will be used to fill low-lying areas. Slag from Blast furnace will be granulated and sold to the cement plants for slag cement. Scrap from SMS and other areas will be recycled in the steel plant to the extent possible. Scale and debris from HSM & CRM will be recycled to the maximum extent possible in the plant itself. The solid waste generated and their probable uses are indicated in the **Table-ES 3**. All the scrap & scales will be recycled fully.

5.04 Noise Level Management

The following measures will be undertaken to reduce noise and its impact:

- Equipment will be placed on rubber bushes to reduce Noise level at 1m distance to 85 dB (A).
- Sound proof enclosures will be provided to operators in high noise zone. Workers will be provided with ear muffs/ earplugs and the duration of exposure of the personnel will be regulated as per applicable norms.
- Regular check-up of workers for noise related health problem and if detected alternative duty will be provided.

6.0 PROJECT BENEFITS

The following benefits are anticipated in the study area:

i) The project is not going to cause any impact on the existing agricultural situation.
ii) There will be change in pattern of demand among people by way of shift from food items to non-food items.
iii) There will be a positive employment and income effects, both direct as well as indirect.
iv) There is a possibility of increase in industrialisation in the vicinity of JSWISL. This is likely to bring more skill diversification among local people.
v) Overall peoples' perception on the project is good. However, some people have a few grievances, which can be mitigated judiciously.

7.0 EMP IMPLEMENTATION AND MONITORING

All necessary steps will be taken to implement the measures suggested by MPCB & CPCB and the Charter on Corporate Responsibility for Environmental Protection

(CREP) for Integrated Iron and Steel Industry. The suggestions given in the EMP shall be implemented by following an implementation schedule. ISO-14001:EMS will be implemented for the total plant.

8.0 COST CONSIDERATIONS

- The total project cost has been estimated to be Rs. 9000/- crores.
- The capital outlay for environmental control measures and CSR commitment estimated to be Rs. 450/- crores.