



## VIKAS METALIKS & ENERGY LTD.

F-4, 1st Floor, Modern Complex,  
Motibagh Chowk, Raipur - 492 001 (C.G.)  
Ph : (0771) 2236690, 3294290, Fax : 2236690,  
E-mail : vspower@rediffmail.com  
CIN:-U27102CT2004PLC017119

6<sup>th</sup> April 2018

To,  
Director (Industry-1)  
Ministry of Environment, Forests & Climate Change  
Indira Paryavaran Bhavan, Jor Bagh,  
Jor Bagh Road, New Delhi - 110 003

**Sub:** Environment Clearance for proposed Sponge Iron plant (1,20,000 TPA), Induction Furnace with CCM & LRF (1,35,000 TPA), Rolling Mill (90,000 TPA), Power Plant through WHRB of 8 MW and FBC of 8 MW at Village Bartori, Tehsil Tilda, District Raipur, Chhattisgarh – Reply to the Additional Information sought – Reg.

- Ref:**
- TOR letter issued vide no. F.No.J-11011/80/2008-IA II (I) dated 7<sup>th</sup> February 2017 for Vikas Metaliks & Energy Limited
  - Public Hearing held on 27<sup>th</sup> November 2017
  - Final EIA report submitted for grant of Environment Clearance vide dt. 2<sup>nd</sup> February 2018
  - EDS generated by MoEF&CC vide dated 27<sup>th</sup> February 2018
  - Additional Information sought by MoEF&CC vide dated 16<sup>th</sup> March 2018

Respected Sir,

We thank the honorable ministry for considering our project for grant of Environment Clearance in the 29<sup>th</sup> EAC meeting scheduled on 12<sup>th</sup> to 14<sup>th</sup> March 2018. Following is the reply to additional information sought by Ministry vide dt. 16<sup>th</sup> March 2018.

<b>Point No. 1</b>	<i>The project land comprises non-agricultural land and agricultural land which is yet to be converted into Non-agricultural land. The total land area breakup into agricultural and non-agricultural along with their respective khasra numbers.</i>
<b>Reply No. 1</b>	Project site is located at Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh. The total land acquired for the proposed project will be 34.26 acres / 13.86 Ha. Khasra nos. involved in project site are 149/5, 6, 8, 9, 10, 15, 16, 20, 21, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 158/1, 158/3, 180, 181/3, 215, 217/3. Total land is in possession of management.  Kindly refer to <b>Annexure – 1</b> for detailed break up of land comprising of non-agricultural land and agricultural land which is yet to be converted into Non-agricultural land along with khasra numbers.
<b>Point No. 2</b>	<i>Stack heights to be revised for 1% sulphur content in the coal.</i>



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**Reply  
No. 2**

- 2 no. of combined stacks each of 71 m will be provided to each 2 x 100 TPD DRI Kilns for effective dispersion of emission into the atmosphere.
- Stack of 62 m height will be provided to the FBC boiler for effective dispersion of emissions into the atmosphere.

Following is the Stack height Calculation:

a) For Sponge Iron (for 4 x 100 TPD DRI Kiln attached to WHRB)

i. With Indian Coal

No. of Kilns	:	4 x 100 TPD
Coal consumption for 2 x 100 TPD Kilns	:	260 TPD
Max. Sulphur content in coal	:	1.0 % (by mass max.)
Total Sulphur dioxide Emission	:	$260 \times 1000 \times 1.0 \times 2 / 24 \times 100$
	:	216.67 kg / hour
Stack height H	:	$14 (Q)^{0.3}$
	:	$14 (216.67)^{0.3}$
	:	<b>70.29 SAY 71 m</b>

ii. With Imported Coal

Coal consumption for 2 x 100 TPD Kilns	:	185 TPD
Max. Sulphur content in coal	:	1.0 % (by mass max.)
Total Sulphur dioxide Emission	:	$185 \times 1000 \times 1.0 \times 2 / 24 \times 100$
	:	154.17 kg / hour
Stack height H	:	$14 (Q)^{0.3}$
	:	$14 (154.17)^{0.3}$
	:	<b>63.46 m SAY 64 m</b>

**2 no. of combined stacks each of 71 m will be provided to each 2 x 100 TPD DRI Kilns for effective dispersion of emission into the atmosphere.**

b) For 8 MW Power Plant (through FBC boiler - 40 TPH)

Entire dolochar generated from the plant i.e. 120 TPD will be used as fuel in FBC boiler. The following will be the fuel requirement which represents the worst environmental scenario.



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	<p>i. <u>With Indian Coal</u></p> <p>Coal consumption : 168 TPD</p> <p>Max. Sulphur content in coal : 1.0 % (by mass max.)</p> <p>Total Sulphur dioxide Emission : <math>168 \times 1000 \times 1.0 \times 2 / 24 \times 100</math></p> <p>: 140.0 kg / hour</p> <p>Stack height H : <math>14 (Q)^{0.3}</math></p> <p>: <math>14 (140)^{0.3}</math></p> <p>: <b>61.65 SAY 62 m</b></p> <p>ii. <u>With Imported Coal</u></p> <p>Coal consumption : 120 TPD</p> <p>Max. Sulphur content in coal : 1.0 % (by mass max.)</p> <p>Total Sulphur dioxide Emission : <math>120 \times 1000 \times 1.0 \times 2 / 24 \times 100</math></p> <p>: 100.0 kg / hour</p> <p>Stack height H : <math>14 (Q)^{0.3}</math></p> <p>: <math>14 (100.0)^{0.3}</math></p> <p>: <b>55.74 m SAY 56 m</b></p> <p><b>Hence a stack of 62 m height will be provided to the FBC boiler for effective dispersion of emissions into the atmosphere.</b></p>																								
<p><b>Point No. 3</b></p>	<p><i>Budget allocation towards Environmental Monitoring should be revised along with the details of CEEMS, calibration frequencies.</i></p>																								
<p><b>Reply No. 3</b></p>	<p>Rs. 14.1 Lakhs/annum is earmarked for Environmental Monitoring. Following is the detailed break up of Budget allocation towards Environmental monitoring.</p> <p style="text-align: center;"><b><u>Detailed break up of recurring cost for Environmental Monitoring</u></b></p> <table border="1"> <thead> <tr> <th>S.No.</th> <th>Monitoring Item</th> <th>No. of units Proposed</th> <th>Monitoring Parameters</th> <th>Frequency of Monitoring</th> <th>No. of Samples /annum</th> <th>Cost / Sample (Rs.)</th> <th>Total cost in (Rs. In lakhs)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Stack</td> <td>10</td> <td>SO<sub>2</sub> &amp; NOx</td> <td>Once in a month</td> <td>120</td> <td>6000</td> <td>720000</td> </tr> <tr> <td>2</td> <td>Effluent</td> <td>3</td> <td>pH, TDS, TSS, O&amp;G, Free Available</td> <td>Twice in a month</td> <td>72</td> <td>600</td> <td>432000</td> </tr> </tbody> </table>	S.No.	Monitoring Item	No. of units Proposed	Monitoring Parameters	Frequency of Monitoring	No. of Samples /annum	Cost / Sample (Rs.)	Total cost in (Rs. In lakhs)	1	Stack	10	SO <sub>2</sub> & NOx	Once in a month	120	6000	720000	2	Effluent	3	pH, TDS, TSS, O&G, Free Available	Twice in a month	72	600	432000
S.No.	Monitoring Item	No. of units Proposed	Monitoring Parameters	Frequency of Monitoring	No. of Samples /annum	Cost / Sample (Rs.)	Total cost in (Rs. In lakhs)																		
1	Stack	10	SO <sub>2</sub> & NOx	Once in a month	120	6000	720000																		
2	Effluent	3	pH, TDS, TSS, O&G, Free Available	Twice in a month	72	600	432000																		



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				Cl, Cu, Fe, Zn, Chromium, PO <sub>4</sub>				
3	Ground water	1	As per IS: 10500	Once in a month	12	700	84000	
4	Noise levels	6	---	Once in a month (hourly)	1728	100	172800	
						<b>Total</b>	<b>1408800</b>	
<b>Note : CAAQMS &amp; Continuous Weather Monitoring Station will be provided</b>								

Capital cost earmarked for Continuous Emission Monitoring System for 5 Stacks will be Rs.25 Lakhs.

**Point No. 4** *Accidental release of pollutants shall be considered for preparation of DMP/ERP.*

**Reply No. 4** In some situations, ESP may fail hence we have considered AIR quality modeeling considering the APCS failure scennario and predicated the icremental concentrations of PM. For this scenario net resultants glcs have been shown in page no. 4.9 of Ch-4 of EIA report.

The net resultant conc. During operation (during APCS failure scenario) 978.1 µg/m<sup>3</sup>, which is much higher than the NAAQS standards.

The following measureing will be taken up to mitigate the impacts:

- Interlocking system will be provided and whenever APCS is not working, then raw material feed will be stopped. Consequently there will be no production in the unit till APCS is rectified.
- The unit cannot be stopped immediately and it will take some time to stop. During this period release of particulate matter will take place, hence mobile dust suppression system will be provided to suppress the particulate matter immediately to mitigate the impact of PM on surroundings.
- Depending upon the wind direction at the time of emergency, Mobile dust suppression equipments will be provided to suppress the dust within the plant and also outside the plant to reduce the impact on habitation, water body, crops etc.
- Immediaterly upon failure of any APCS, emergency siren will be blown to inform the employees and nearby villagers about the emergency.
- Dust masks will be provided to the employees and near by villagers. Immediately upon hearing siren, every employee and villager must wear the dust mask.
- Mock drills will be conducted in the nearby villages for the emergency preparedness.

**Point No. 5** *ESC details to be furnished based on SIA and Public consultation. The time period of completion of ESC shall be inline with time schedule for project completion.*

**Reply No. 5** Total cost of the proposed project : Rs. 125 Crores  
Expenditure earmarked towards ESC : 2.5 % of project cost (as per TOR condition)  
Work out to : Rs. 3.2 Crores



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Project will be implemented in 3 years, hence will be ESC will be completed in 3 years span. Following is the detailed break up of expenditure to be incurred in 3 Years.

S.No.	Major Activity Heads	Years (Rs. In Crores)			Total Expenditure (Rs. In Crores)
		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	
<b>A</b>	<b>Based on Social Impact Assessment (SIA)</b>				
1	Community & Infrastructure Development Programmes (construction toilets in villages which are not covered under Swachh Bharat)	0.3	0.3	0.2	0.80
2	A Community Centre will be established in the Bartori village which will consist of the following: i. Vocational Training Institute with latest tools, machinery & softwares etc. for making them Industry ready. ii. Workshop centre with latest tailoring machines for training women (like tailoring, stitching etc.) iii. Computer / IT Training Centre for improving computer knowledge and making Industry ready.	0.3	0.3	0.4	1.00
3	Education and Scholarship Programmes (construction of class rooms in schools, providing computers in class rooms, development of library facility)	0.12	0.12	0.12	0.36
4	RWH in nearby villages	---	0.05	0.05	0.10
<b>B</b>	<b>Based on Public Hearing / Consultation</b>				
1	Laying of 15 feet village road within the plant site (as per request made by public during PH, construction of over-head tank.)	0.50	---	---	0.50
2	School & Hospital (Basic facilities along with ambulance) should be open in the village	---	0.20	0.24	0.44
<b>Grand Total</b>					<b>3.20</b>

**Point No. 6**

EIA report shall be revised as per the Annexure-III of EIA Notification, 2006

**Reply No. 6**

Kindly refer to **Annexure – 2** for Revised EIA report.



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<b>Point No. 7</b>	<i>The Corporate Environment Policy should clearly state the reporting mechanism to the board of directors immediately in case of any non-compliances / deviations / violations of Environmental Clearance conditions</i>
<b>Reply No. 7</b>	Kindly refer to <b>Annexure – 3</b> for Corporate Environment Policy
<b>Point No. 8</b>	<i>Ground water with drawl permission for the proposed quantity</i>
<b>Reply No. 8</b>	Ground Water drawl permission from CGWA has been obtained NOC no. CGWA/NOC/IND/ORIG/2018/3370. Letter is yet to be issued.  Kindly refer to <b>Annexure – 4</b> for screenshot from the CGWA website showing Approval of NOC for drawl of ground water.

In this regard, we request your goodselves to kindly process our application and place our proposal in the forthcoming EAC meeting for issue of Environment Clearance.

Thanking you,  
Regards

Yours sincerely

for **VIKAS METALIKS & ENERGY LIMITED**

**UMESH SHARMA**  
**MANAGING DIRECTOR**

Project site is located at Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh.

The total land acquired for the proposed project will be 34.26 acres / 13.86 Ha. Khasra nos. involved in project site are 149/5, 6, 8, 9, 10, 15, 16, 20, 21, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 158/1, 158/3, 180, 181/3, 215, 217/3. Total land is in possession of management.

Out of total land 34.26 acres / 13.86 Ha. of land,

- Land diverted for Industrial Purpose - 31.94 acres / 12.90 Ha.
- Land undiverted - 2.32 acres / 0.96 Ha.

S.No.	Khasra No. as per EIA report	Extent (in Ha.)	Extent (in Acres)	Status of Land (Diverted / Undiverted)
1	149/5	0.308	0.76	Diverted for Industrial Purpose
2	149/6	0.372	0.92	Diverted for Industrial Purpose
3	149/8	0.202	0.50	Diverted for Industrial Purpose
4	149/9	0.279	0.69	Diverted for Industrial Purpose
5	149/10	0.243	0.60	Diverted for Industrial Purpose
6	149/15	0.437	1.08	Diverted for Industrial Purpose
7	149/16	0.405	1.00	Diverted for Industrial Purpose
8	149/20	0.036	0.09	Diverted for Industrial Purpose
9	149/21	0.656	1.66	Diverted for Industrial Purpose
10	149/25	0.308	0.76	Diverted for Industrial Purpose
11	149/26	0.308	0.76	Diverted for Industrial Purpose
12	149/27	0.304	0.75	Diverted for Industrial Purpose
13	149/28	0.373	0.92	Diverted for Industrial Purpose
14	149/29	0.373	0.92	Diverted for Industrial Purpose
15	149/30	0.373	0.92	Diverted for Industrial Purpose
16	149/31	0.243	0.60	Diverted for Industrial Purpose
17	149/32	0.243	0.60	Diverted for Industrial Purpose
18	149/33	0.243	0.60	Diverted for Industrial Purpose
19	149/34	0.499	1.23	Diverted for Industrial Purpose
20	149/35	0.069	0.17	Diverted for Industrial Purpose
21	149/36	0.069	0.17	Diverted for Industrial Purpose
22	149/37	0.101	0.25	Diverted for Industrial Purpose
23	149/38	0.101	0.25	Diverted for Industrial Purpose
24	149/39	0.101	0.25	Diverted for Industrial Purpose
25	149/40	0.101	0.25	Diverted for Industrial Purpose
26	149/41	0.069	0.17	Diverted for Industrial Purpose
27	149/42	0.591	1.46	Diverted for Industrial Purpose
28	149/43	0.591	1.46	Diverted for Industrial Purpose

S.No.	Khasra No. as per EIA report	Extent (in Ha.)	Extent (in Acres)	Status of Land (Diverted / Undiverted)
29	149/44	0.405	1.00	Diverted for Industrial Purpose
30	149/45	0.405	1.00	Diverted for Industrial Purpose
31	149/46	0.405	1.00	Diverted for Industrial Purpose
32	149/47	0.291	0.72	Diverted for Industrial Purpose
33	149/48	0.202	0.50	Diverted for Industrial Purpose
34	149/49	0.091	0.22	Diverted for Industrial Purpose
35	149/50	0.607	1.50	Diverted for Industrial Purpose
36	149/51	0.809	2.00	Diverted for Industrial Purpose
37	149/52	0.607	1.40	Diverted for Industrial Purpose
39	149/53	0.607	1.40	Diverted for Industrial Purpose
40	149/54	0.607	1.40	Diverted for Industrial Purpose
38	149/55	0.607	1.40	<b>Undiverted Land</b>
41	158/1	0.153	0.40	<b>Undiverted Land</b>
42	158/3	0.085	0.21	<b>Undiverted Land</b>
43	180	0.061	0.15	<b>Undiverted Land</b>
44	181/3	0.024	0.06	<b>Undiverted Land</b>
45	215	0.024	0.06	<b>Undiverted Land</b>
46	217/3	0.016	0.04	<b>Undiverted Land</b>
	<b>Total</b>	<b>13.86</b>	<b>34.26</b>	

# Vikas Metaliks & Energy Limited

[Proposed Sponge Iron Plant of 1,20,000 TPA, Induction furnace with CCM & LRF of 1,35,000 TPA, Rolling Mill of 90,000 TPA, Power Plant through WHRB of 8 MW, Power Plant through FBC Boiler of 8 MW]

Category – A Project

at

Bartori Village, Tilda Tehsil,  
Raipur District, Chhattisgarh

## Revised Final Environmental Impact Assessment Report

[Based on TOR letter vide No. F. No. J-11011/80/2008-IA II (I) dt. 7<sup>th</sup> February 2017]

Monitoring Period

March 2017 to May 2017

Laboratory

M/s. Universal Enviro Associates, Hyderabad (MoEF&CC recognised Laboratory)

APRIL 2018

Prepared by:



ISO 9001: 2008 Certified



Accredited by NABET - QCI

6-3-652 | Flat # 7-3 | Dhruvatara Apartments | Amrutha Estates | Erramanjil | Somajiguda |  
Hyderabad- 500082



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### **UNDERTAKING**

I, **UMESH SHARMA, Managing Director** of **VIKAS METALIKS & ENERGY LTD.** give this undertaking to the effect that the ToRs prescribed by MoEF&CC, New Delhi vide letter no. F. No. **J-11011/80/2008-IA II (I) data. 7<sup>th</sup> February 2017**, for our proposed Sponge Iron Plant of 1,20,000 TPA, Induction furnace with CCM & LRF of 1,35,000 TPA, Rolling Mill of 90,000 TPA, Power Plant through WHRB of 8 MW, Power Plant through FBC Boiler of 8 MW at Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh has been complied with and the data submitted are factually correct.

Date : 01<sup>st</sup> August 2017

Place : Raipur

**For & behalf of M/s. Vikas Metaliks & Energy Ltd.**

**(Shri. Umesh Sharma, Director)**

## DECLARATION

Declaration by Experts contributing to the Final EIA report for the proposed Steel Plant by **M/s. Vikas Metaliks & Energy Ltd.** at Village Bartori, Tehsil Tilda, District Raipur, Chhattisgarh.

We, hereby, certify that we were part of the EIA team in the following capacity that developed the above EIA.

**EIA Coordinator** : Metallurgical Industries (Ferrous & Non-ferrous)



**Name** : Mr. Y. Maheshwara Reddy

**Signature** : *Y M Reddy*

**Date** 30/01/2018

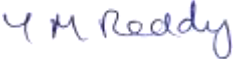
### DECLARATION BY FUNCTIONAL AREA EXPERTS INVOLVED IN THE PREPARATION OF EIA REPORT

Functional Area	Name of the Expert	Involvement (Period)	Signature
AP	Mr. Y. Maheshwara Reddy	Commnced from March 2017	<i>Y M Reddy</i>
WP	Mr. Y. Maheshwara Reddy	Commnced from March 2017	<i>Y M Reddy</i>
SW	Mr. Y. Maheshwara Reddy	Commnced from March 2017	<i>Y M Reddy</i>
SE	Mr. I. Durga Prasad	Commnced from March 2017	<i>I Durga Prasad</i>
EB	Prof. Bayyapu Reddy	Commnced from March 2017	<i>Prof. Bayyapu Reddy</i>
HG	Mr. V. Tarun Chander	Commnced from March 2017	<i>V. Tarun Chander</i>
GEO	Mr. V. Tarun Chander	Commnced from March 2017	<i>V. Tarun Chander</i>
SC	Prof. Bayyapu Reddy	Commnced from March 2017	<i>Prof. Bayyapu Reddy</i>
AQ	Mr. Y. Maheshwara Reddy	Commnced from March 2017	<i>Y M Reddy</i>
NV	Mr. B. Kotaiah	Commnced from March 2017	<i>B. Kotaiah</i>
LU	Dr. Y. Ramamohan	Commnced from March 2017	<i>Dr. Y. Ramamohan</i>
RH	Mr. D.H. Patel	Commnced from March 2017	<i>D.H. Patel</i>

Involved as	Name of the person	Involvement (Period)	Signature
Team Member	Mr. Nagarjuna SRD	Commnced from March 2017	
Team Member	Mr. B. Shravan Goud	Commnced from March 2017	

**Declaration by the Head of the Accredited Consultant Organization**

I, **Y. MAHESHWARA REDDY**, hereby, confirm that the above-mentioned experts prepared the EIA for **M/s. VIKAS METALIKS & ENERGY LIMITED** for their proposed Steel Plant situated at Village Bartori, Tehsil Tilda, District Raipur, Chhattisgarh. I also confirm that I shall be fully accountable for any misleading information mentioned in this statement.

**Signature** :   
**Name** : Y. Maheshwara Reddy  
**Designation** : Managing Director  
**Organization** : Pioneer Enviro Laboratories & Consultants Pvt. Ltd., Hyderabad  
**Date** : 30/01/2018

## INDEX

S.No.	Contents	Page No.
	TOR LETTER	
	TOR COMPLIANCE	i to xiii
<b>Chapter – 1 : Introduction</b>		
1.1	Purpose of the Report	1.1
1.2	Identification of Project & Project Proponent	1.2
1.3	Brief Description	1.4
1.3.1	Nature of the Project	1.4
1.3.2	Size of the Project (Existing & Proposed)	1.5
1.3.3	Location of the Project	1.5
1.3.4	Importance of Project	1.5
1.4	Scope of the Study	1.6
1.5	Environmental Clearance Process (Category – A Projects)	1.7
<b>Chapter – 2 : Project Description</b>		
2.1	Type of Project	2.1
2.2	Need for the Project	2.1
2.3	Location of the Project	2.2
2.3.1	Environmental Setting Within 10 Km. Radius of the Project Site	2.6
2.3.2	List of industries within 10 km. Radius of the project site	2.7
2.4	Details of Land	2.7
2.5	Size / Magnitude of Operation	2.12
2.6	Proposed Schedule for Approval and Implementation	2.13
2.7	Project Cost	2.14
2.8	Technology & Process Description	2.14
2.8.1	Raw Materials	2.14
2.8.2	Raw Material Transport, Storage & Handling	2.15
2.8.3	Material Balance	2.15
2.8.4	Manufacturing Process	2.17
2.8.4.1	DRI Plant	2.17
2.8.4.2	Steel Melting Shop (SMS)	2.20
2.8.4.3	Rolling Mill	2.22
2.8.4.4	Power Generation (WHRB & FBC)	2.27
2.8.5	Power Requirement	2.29
2.9	Environmental Mitigation Measures	2.29
2.9.1.	Air Emission Control	2.29
2.9.1.1	Dust Extraction And Dust Suppression System	2.31
2.9.1.2	Sources Of Air Pollution (DRI Kilns)	2.32
2.9.1.3	Technical Specifications Of Control Systems	2.34
2.9.2.	Waste Water Management	2.36
2.9.3.	Noise Level Management	2.37
2.9.4.	Solid Waste Management	2.38
2.9.5.	Green Belt Development	2.40

2.10	Assessment of new & Untested Technology for the Risk of technological Failure	2.40
<b>Chapter – 3 : Description of Environment</b>		
3.1	Baseline Environmental Status	3.1
3.2	Air Environment	3.1
3.2.1	Meteorology	3.1
3.2.2	Meteorological Data Recorded at Site	3.2
3.2.3	Air Quality	3.5
3.2.3.1	Selection of Sampling Stations	3.5
3.2.3.2	Parameters Monitored	3.5
3.2.3.3	Sampling & Analytical Techniques, Instruments used For Sampling	3.6
3.3	Noise Environment	3.12
3.3.1	Reconnaissance	3.13
3.3.1.1	Background Noise	3.13
3.3.1.2	Sources of Noise	3.13
3.3.2	Community Noise	3.13
3.3.2.1	Occupational Exposure	3.14
3.3.3	Methodology Adopted for Noise Level Observation	3.15
3.3.4	Noise Level Observations in the Study Area	3.15
3.4	Water Quality Impacts	3.19
3.4.1	Surface Water Quality	3.19
3.4.2	Ground Water Quality	3.20
3.5	Land Environment	3.31
3.5.1	Geological & Hydrogeological Status of the Area	3.31
3.5.2	Mineral Reserves	3.32
3.5.3	Seismic Effect	3.32
3.5.4	Land Use Pattern	3.33
3.5.5	Soil Environment	3.37
3.6	Biological Environment	3.41
3.6.1	Objectives Of The Study	3.41
3.6.2	Methodology Of The Floral And Faunal Study	3.41
3.6.3	Description Of The Project Site & Study Area	3.42
3.6.4	Details Of Flora In The Study Area	3.43
3.6.5	Details Of Fauna In The Study Area	3.44
3.6.6	Interpretation Of Biological Environment Study	3.47
3.7	Social Impact Assessment	3.49
3.7.1	Legislative & Regulatory Considerations	3.50
3.7.2	Objective	3.50
3.7.3	Scope	3.50
3.7.4	Approach & Methodology	3.51
3.7.5	Study Area	3.52
3.7.6	Project Impact Zones	3.53
3.7.7	Baseline Data And Analysis of Surveyed Villages	3.56
3.7.7.1	Desktop Review / Research	3.56

3.7.7.2	Field Survey	3.57
3.7.7.3	Data Analysis & Its Interpretation	3.58
3.7.8	Socio Economic Status	3.63
3.7.9	Interpretation On Socio-Economic	3.66
3.7.10	Conclusion	3.68
<b>CHAPTER – 4 : Anticipated Environmental Impacts &amp; Mitigation Measures</b>		
4.1	Introduction	4.1
4.2	Air Environment	4.1
4.2.1	Impact on Topography and Climate	4.2
4.2.1.1	Impact on Topography	4.2
4.2.1.2	Impact on Climate	4.2
4.2.2	Predictions of Impact on Air Environment	4.2
4.2.3	Stack Height Calculation	4.4
4.3	Prediction of Impacts on Water Environment	4.16
4.3.1	Water Requirement	4.16
4.3.2	Wastewater Generation	4.18
4.3.3	Impact on Surface Water Bodies	4.18
4.4	Prediction of Impacts due to Noise	4.19
4.4.1	Prediction of Impact Due to the Proposed Activity	4.19
4.4.2	Prediction of Impacts on Community	4.20
4.4.3	Prediction of Impact on Occupational Health	4.21
4.5	Prediction of Impacts on Land Environment	4.21
4.6	Prediction of Impacts Due to Vehicular Movement	4.21
4.7	Prediction Of Impacts On Flora & Fauna	4.24
4.8	Prediction of Impacts on Socio Economic Environment	4.24
<b>CHAPTER – 5 : Analysis of Alternatives [Technology &amp; Site]</b>		
5.1	Alternative Technologies	5.1
5.2	Alternative Sites	5.1
<b>CHAPTER – 6 : Environmental Monitoring Programme</b>		
6.1	Technical Aspects	6.1
6.1.1	Methodologies	6.1
6.1.2	Frequency & Locations of Environmental Monitoring	6.2
6.1.3	Data Analysis	6.2
6.1.4	Reporting Schedule	6.3
6.1.5	Emergency Procedures	6.3
6.1.6	Detailed Budget & Procurement Schedules	6.3
<b>CHAPTER – 7 : Additional Studies</b>		
7.1	Introduction	7.1
7.2	Public Consultation	7.1
7.2.1	Proceedings Of Public Hearing	7.1
7.2.2	Public Hearing Advertisement	7.2

7.2.3	Management Response For The Issues Raised During Public Hearing & Action Plan	7.3
7.2.4	Summary Of Esc Activities, Budget Allocation With Time Schedule	7.12
7.3	Risk Assessment	7.13
7.3.1	Introduction	7.13
7.3.2	Scope of Study	7.13
7.3.3	Fire Protection System	7.13
7.3.4	Methodology of MCA Analysis	7.14
7.3.5	Fire & Explosion and Toxicity Index	7.15
7.3.6	Assessment of Risk at M/s. Vikas Metaliks & Energy Limited	7.16
7.3.7	Risk & Consequence Analysis of Fire	7.19
7.3.7.1	Methodology	7.19
7.4	Disaster Management Plan	7.21
7.4.1	Disasters	7.21
7.4.2	Objectives of Disaster Management of Plan	7.21
7.4.3	Emergencies	7.22
7.4.3.1	General, Industrial, Emergencies	7.22
7.4.3.2	Specific Emergencies Anticipated	7.23
7.4.3.3	Emergency Organization	7.23
7.4.3.4	Emergency Communication	7.23
7.4.3.5	Emergency Responsibilities	7.24
7.4.3.5.1	Site Controller	7.24
7.4.3.5.2	Incident Controller	7.25
7.4.3.5.3	Emergency-Coordinator, Rescue, Fire Fighting	7.25
7.4.3.5.4	Emergency-Coordinator, Medical, Mutual Aid, Rehabilitation, Transport and Communication	7.26
7.4.3.5.5	Emergency-Coordinator, Essential Services	7.27
7.4.3.5.6	General Responsibilities of Employees during an Emergency	7.27
7.4.3.6	Emergency Facilities	7.27
7.4.3.6.1	Emergency Control Centre	7.27
7.4.3.6.2	Emergency Power Supply	7.28
7.4.3.6.3	Fire Fighting Facilities	7.28
7.4.3.6.4	Location of Wind Sock	7.28
7.4.3.6.5	Emergency Medical Facilities	7.28
7.4.3.7	Emergency Actions	7.29
7.4.3.7.1	Emergency Warning	7.29
7.4.3.7.2	Emergency Shutdown	7.29
7.4.3.7.3	Evacuation of Personnel	7.29
7.4.3.7.4	All Clear Signal	7.29
7.5	Occupational Health and Surveillance	7.30
7.5.1	Occupational Health	7.30
7.5.2	Construction & Erection	7.30
7.5.3	Operation & Maintenance	7.30
7.5.4	Occupational Health	7.31
7.6	Safety Plan	7.34

7.6.1	Safety Organization	7.35
7.6.1.1	Construction and Erection Phase	7.35
7.6.1.2	Operation & Maintenance Phase	7.35
7.6.1.3	Safety Circle	7.35
7.6.2	Safety Training	7.35
7.6.3	Health and Safety Monitoring Plan	7.36
7.7	Social Impact Assessment	7.36
7.8	R & R Action Plan	7.36
<b>CHAPTER – 8 : Project Benefit</b>		
8.1	Physical Infrastructure	8.1
8.2	Socio Infrastructure	8.1
8.3	Employment Potential	8.1
8.3.1	Skilled	8.1
8.3.2	Semi-Skilled	8.1
8.3.3	Unskilled	8.1
8.4	Socio-Economic Developmental Activities Proposed (ESC)	8.2
<b>CHAPTER – 9 : Environmental Cost Benefits</b>		
9.0	Environmental Cost Benefit Analysis	9.1
<b>CHAPTER – 10 : Environmental Management Plan</b>		
10.1	Introduction	10.1
10.2	Management during Construction phase	10.2
10.2.1	Site Preparation	10.2
10.2.2	Water Supply & Sanitation	10.2
10.2.3	Noise	10.2
10.2.4	Maintenance of Vehicles	10.2
10.2.5	Waste	10.3
10.2.6	Storage of Hazardous Material	10.3
10.2.7	Land Environment	10.3
10.3	Post Construction Phase	10.3
10.3.1	Air Emission Management	10.3
10.3.1.1	Dust Extraction And Dust Suppression System	10.4
10.3.1.2	Technical Specifications of Control Systems	10.7
10.3.1.2.1	Technical Specifications of Electrostatic Precipitator	10.7
10.3.1.2.2	Technical Specifications Of Bagfilter (To Induction Furnace)	10.7
10.3.2	Action Plan for Control and Monitoring of Fugitive Emissions	10.8
10.3.2.1	Control of Fugitive Emissions from Sponge Iron Plant	10.8
10.3.2.2	Monitoring of Secondary Fugitive Emissions	10.8
10.3.2.3	Dust Suppression System	10.9
10.3.2.4	Internal Roads	10.9
10.3.2.5	Interlocking System	10.9
10.3.3	Compliance on CREP Recommendations	10.9
10.3.4	Wastewater Management	10.10

10.3.5	Solid Waste Generation & its Disposal	10.12
10.3.6	Noise Level Management	10.14
10.3.7	Land Environment	10.14
10.3.8	Measures for Improvement of Ecology	10.15
10.3.8.1	Green Belt Development	10.15
10.3.9	Rainwater Harvesting	10.18
10.4	Post Project Monitoring Strategy	10.19
10.5	Cost for Environmental Protection	10.20
<b>CHAPTER – 11 : Summary</b>		
11.1	Description of the Project	11.1
11.2	Details About the Project	11.1
11.3	Environmental Setting Of The Proposed Project Site	11.2
11.4	Environmental Impacts & Mitigation Measures	11.2
11.5	Environmental Management Plan	11.4
11.6	Environmental Monitoring Program	11.5
11.7	Public Consultation	11.6
11.8	Project Benefits	11.6
11.9	Social Impacts	11.6
<b>CHAPTER – 12 : Disclosure of Consultant</b>		
12.0	Disclosure of Consultant Engaged	12.1

## List of Annexures

<b>Annexure</b>	<b>Documents</b>
Annexure – 1	Executive Summary
Annexure – 2	Earlier Environment Clearance
Annexure – 3	A letter issued by DFO confirming there are no National Parks, Wild life Sanctuaries, eco-sensitive zones, elephant / tiger reserves, migratory routes and Bird Sanctuaries within 10 Km radius.
Annexure – 4	Complete AAQ One season data
Annexure – 5	Socio-economic details
Annexure – 6	Expression of Interest for Utilization of Ash
Annexure – 7	Corporate Environment Policy
Annexure – 8	MoU for Imported Coal
Annexure – 9	CGWB approval
Annexure – 10	Public Hearing proceeding

**F. No. J-11011/80/2008-IA.II(I)**  
Government of India  
Ministry of Environment, Forest and Climate Change  
(I.A. Division)

Indira Paryavaran Bhawan  
Jor Bagh Road, Aliganj,  
New Delhi - 110003  
E-mail: ad.raju@nic.in  
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Dated: 7<sup>th</sup> February, 2017

To

✓ **M/s Vikas Metaliks & Energy Ltd.,**  
Village Bartori, Tehsil Tilda,  
District Raipur, Chhattisgarh.

**Subject: Sponge Iron Plant (1,20,000 TPA), Induction furnace with CCM & LRF(1,35,000 TPA, Rolling Mill (90,000 TPA), Power Plant through WHRB of 8 MW (after Dropping 10 MW) capacity, Power Plant (8 MW) of M/s Vikas Metaliks & Energy Ltd., located at Village Bartori, Tehsil Tilda, District Raipur, Chhattisgarh - prescribing of ToRs regarding.**

Sir,

This has reference to your online application No. IA/CG/IND/60150/2016 dated 4th November, 2016 along with the application in prescribed format (Form-I), copy of pre-feasibility report and proposed TORs for undertaking detailed EIA and EMP study as per the EIA Notification, 2006 for the project mentioned above. The proposed project activity is listed at S.No. 3(a), under category 'A' of the Schedule of EIA Notification, 2006 and appraised at the Central level.

2.0 The project of M/s Vikas Metaliks & Energy Limited, located at Village Bartori, Tilda Tehsil, District Raipur, Chhattisgarh was earlier accorded Environmental Clearance (EC) by the Ministry vide letter No. J-11011/80/2008 - IA II (I) dated 9<sup>th</sup> June 2009. The EC was accorded for the following components.

S.No.	Details	EC Obtained on 9 <sup>th</sup> June 2009
1.	Pelletizing Unit	6,00,000 TPA (1x2000 TPD)
2.	Pig Iron through Blast Furnace	1,65,000 TPA (1x250 m <sup>3</sup> )
3.	DRI Kiln for Production of Sponge Iron	1,05,000 TPA (2x175 TPD) 1,50,000 TPA (1 x 500 TPD)
4.	Induction furnace with CCM & LRF	1,80,000 TPA (4x15 MT/heat)
5.	Rolling Mill	90,000 TPA (1x300 TPD)
6.	Ferro Alloy plant for production of Si-Mn	15,000 TPA (1x9 MVA)
7.	Power Plant through WHRB	18 MW (1 x 12 MW & 2x 3 MW)
8.	Power Plant through FBC Boiler	15 MW (1x15 MW)

3.0 The Project Proponent could not implement any of the Units for which Environmental Clearance was accorded, due to sluggish market conditions and non-availability of Funds. Further, the proponent mentioned that the EC validity of 7 years has already been expired on 8<sup>th</sup> June 2016 and they could not submit the request letter to MoEFCC for extension of validity of EC before the expiry of validity period. Therefore, a fresh proposal has been submitted to the Ministry for grant of EC as per the provisions of EIA notification, 2006.

4.0 The PP has now proposed reduced capacities of Sponge Iron, SMS, Power, dropping of Pellet plant, BF, Ferro Alloys. An area of 34.26 acres of land is envisaged and is already acquired by the Project Authorities. Revised plant configuration and production capacity is as following:

S.No.	Details		Plant Configuration	Production Capacity
1.	DRI Kiln for Production of Sponge Iron		4 x 100 TPD	1,20,000 TPA
2.	Induction furnace with CCM & LRF		3 x 15 MT/heat	1,35,000 TPA
3.	Rolling Mill		1 x 300 TPD	90,000 TPA
4.	Power Generation	WHRB	4 x 2 MW	8 MW
		FBC Boiler (40 TPH)	---	8 MW

5.0 Estimated project cost for proposed project will be Rs. 125 Crores. Total water requirement for project will be 450 cum/day, which will be sourced from ground water. Prior permission from CGWA will be obtained. There will be no effluent generation in the DRI, SMS & Rolling Mill units as closed circuit cooling system will be adopted.

6.0 The proposal was considered by the Expert Appraisal Committee (Industry-I) during its 13<sup>th</sup> meeting held on 23<sup>rd</sup> to 24<sup>th</sup> November, 2016 for prescribing TORs for undertaking detailed EIA/EMP study and recommended the project for prescribing following specific TORs for undertaking detailed EIA and EMP study in addition to the generic TOR enclosed **at Annexure I read with additional TORs at Annexure-2.**


- i. Public Hearing to be conducted by the Chhattisgarh Environment Conservation Board.
- ii. The issues raised during public hearing and commitment of the project proponent on the same along with time bound action plan to implement the commitment and financial allocation thereto should be clearly provided.
- iii. The project proponent should carry out social impact assessment of the project as per the Office Memorandum No. J-11013/25/2014-IA.I dated 11.08.2014 issued by the Ministry regarding guidelines on Environment Sustainability and CSR related issues. The social impact assessment study so carried out should form part of EIA and EMP report.

7.0 The undersigned is directed to inform that the Ministry of Environment, Forest and Climate Change (MoEFCC) after accepting the recommendation of the EAC (Industry-I), hereby decided to accord ToRs for the above project.

8.0 It is requested that the draft EIA and EMP Report may be prepared in accordance with the above mentioned specific TORs and enclosed generic TORs and additional TORs and thereafter further necessary action including conduct of public consultation may be taken for obtaining Environment Clearance in accordance with the procedure prescribed under the EIA Notification, 2006 as amended.


9.0 The TORs are valid for a period of three years from today i.e 07.02.2017 and will expire on 06.02.2020 However, this period could be further extended by a maximum period

of one year provided an application is made by the project proponent at least three months before the expiry of the validity period, together with updated Form-I, based on proper justification.

  
**(Amardeep Raju)**  
**Scientist 'D'**

Copy to:-

1. The Secretary, Department of Environment, Government of Chhattisgarh.
2. The Additional Principal Chief Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (WCZ), Ground Floor, East Wing, New Secretariat Building, Civil Line, Nagpur-440001.

  
**(Amardeep Raju)**  
**Scientist 'D'**

**GENERIC TERMS OF REFERENCE (TOR) IN RESPECT OF INDUSTRY SECTOR**

1. Executive Summary
2. Introduction
  - i. Details of the EIA Consultant including NABET accreditation
  - ii. Information about the project proponent
  - iii. Importance and benefits of the project
3. Project Description
  - i. Cost of project and time of completion.
  - ii. Products with capacities for the proposed project.
  - iii. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.
  - iv. List of raw materials required and their source along with mode of transportation.
  - v. Other chemicals and materials required with quantities and storage capacities
  - vi. Details of Emission, effluents, hazardous waste generation and their management.
  - vii. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular and contract)
  - viii. The project proponent shall furnish the requisite documents from the competent authority in support of drawl of ground water and surface water and supply of electricity.
  - ix. Process description along with major equipments and machineries, process flow sheet (Quantative) from raw material to products to be provided
  - x. Hazard identification and details of proposed safety systems.
  - xi. Expansion/modernization proposals:
    - a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30<sup>th</sup> May, 2012 on the status of compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing /existing operation of the project from SPCB shall be attached with the EIA-EMP report.
    - b. In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.
4. Site Details
  - i. Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.

- ii. A toposheet of the study area of radius of 10km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet. (including all eco-sensitive areas and environmentally sensitive places)
- iii. Co-ordinates (lat-long) of all four corners of the site.
- iv. Google map-Earth downloaded of the project site.
- v. Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.
- vi. Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.
- vii. Landuse break-up of total land of the project site (identified and acquired), government/private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included. (not required for industrial area)
- viii. A list of major industries with name and type within study area (10km radius) shall be incorporated. Land use details of the study area
- ix. Geological features and Geo-hydrological status of the study area shall be included.
- x. Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of the project site and maximum Flood Level of the river shall also be provided. (mega green field projects)
- xi. Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.
- xii. R&R details in respect of land in line with state Government policy

5. **Forest and wildlife related issues (if applicable):**

- i. Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department. (if applicable).
- ii. Land use map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland (*in case of projects involving forest land more than 40 ha*).
- iii. Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.
- iv. The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-à-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon.
- v. Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area.
- vi. Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National Board for Wildlife

6. **Environmental Status**

- i. Determination of atmospheric inversion level at the project site and site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall.
- ii. AAQ data (except monsoon) at 8 locations for PM10, PM2.5, SO<sub>2</sub>, NO<sub>x</sub>, CO and other parameters relevant to the project shall be collected. The monitoring

stations shall be based CPCB guidelines and take into account the predominant wind direction, population zone and sensitive receptors including reserved forests.

- iii. Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM Notification of Nov. 2009 along with – min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.
- iv. Surface water quality of nearby River (60m upstream and downstream) and other surface drains at eight locations as per CPCB/MoEF&CC guidelines.
- v. Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC.
- vi. Ground water monitoring at minimum at 8 locations shall be included.
- vii. Noise levels monitoring at 8 locations within the study area.
- viii. Soil Characteristic as per CPCB guidelines.
- ix. Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed project, parking arrangement etc.
- x. Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.
- xi. Socio-economic status of the study area.

## 7. Impact Assessment and Environment Management Plan

- i. Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be well assessed. Details of the model used and the input data used for modelling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.
- ii. Water Quality modelling – in case, if the effluent is proposed to be discharged in to the local drain, then Water Quality Modelling study should be conducted for the drain water taking into consideration the upstream and downstream quality of water of the drain.
- iii. Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined.
- iv. A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules.
- v. Details of stack emission and action plan for control of emissions to meet standards.
- vi. Measures for fugitive emission control
- vii. Details of hazardous waste generation and their storage, utilization and disposal. Copies of MOU regarding utilization of solid and hazardous waste shall also be included. EMP shall include the concept of waste-minimization,

recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.

- viii. Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.
- ix. Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be incorporated.
- x. Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.
- xi. Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.
- xii. Action plan for post-project environmental monitoring shall be submitted.
- xiii. Onsite and Offsite Disaster (natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.

## 8. Occupational health

- i. Details of existing Occupational & Safety Hazards. What are the exposure levels of above mentioned hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved,
- ii. Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre placement and periodical examinations give the details of the same. Details regarding last month analyzed data of abovementioned parameters as per age, sex, duration of exposure and department wise.
- iii. Annual report of health status of workers with special reference to Occupational Health and Safety.
- iv. Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers.

## 9. Corporate Environment Policy

- i. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.
- ii. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.
- iii. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.

- iv. Does the company have system of reporting of non compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report
10. Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.
11. Enterprise Social Commitment (ESC)
  - i. Adequate funds (Atleast 2.5 % of the project cost) shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan shall be included. Socio-economic development activities need to be elaborated upon.
12. Any litigation pending against the project and/or any direction/order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance/ATR to the notice(s) and present status of the case.
13. 'A tabular chart with index for point wise compliance of above TORs.
14. The TORs prescribed shall be valid for a period of three years for submission of the EIA-EMP reports along with Public Hearing Proceedings (wherever stipulated).

The following general points shall be noted:

- i. All documents shall be properly indexed, page numbered.
- ii. Period/date of data collection shall be clearly indicated.
- iii. Authenticated English translation of all material in Regional languages shall be provided.
- iv. The letter/application for environmental clearance shall quote the MOEF file No. and also attach a copy of the letter.
- v. The copy of the letter received from the Ministry shall be also attached as an annexure to the final EIA-EMP Report.
- vi. The index of the final EIA-EMP report must indicate the specific chapter and page no. of the EIA-EMP Report
- vii. While preparing the EIA report, the instructions for the proponents and instructions for the consultants issued by MOEF vide O.M. No. J-11013/41/2006-IA.II (I) dated 4<sup>th</sup> August, 2009, which are available on the website of this Ministry shall also be followed.
- viii. The consultants involved in the preparation of EIA-EMP report after accreditation with Quality Council of India (QCI) /National Accreditation Board of Education and Training (NABET) would need to include a certificate in this regard in the EIA-EMP reports prepared by them and data provided by other organization/Laboratories including their status of approvals etc. Name of the Consultant and the Accreditation details shall be posted on the EIA-EMP Report as well as on the cover of the Hard Copy of the Presentation material for EC presentation.
- ix. TORs' prescribed by the Expert Appraisal Committee (Industry) shall be considered for preparation of EIA-EMP report for the project in addition to all the relevant

information as per the 'Generic Structure of EIA' given in Appendix III and IIIA in the EIA Notification, 2006. Where the documents provided are in a language other than English, an English translation shall be provided. The draft EIA-EMP report shall be submitted to the State Pollution Control Board of the concerned State for conduct of Public Hearing. The SPCB shall conduct the Public Hearing/public consultation, district-wise, as per the provisions of EIA notification, 2006. The Public Hearing shall be chaired by an Officer not below the rank of Additional District Magistrate. The issues raised in the Public Hearing and during the consultation process and the commitments made by the project proponent on the same shall be included separately in EIA-EMP Report in a separate chapter and summarised in a tabular chart with financial budget (capital and revenue) along with time-schedule of implementation for complying with the commitments made. The final EIA report shall be submitted to the Ministry for obtaining environmental clearance.

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**INDUCTION/ARC FURNACES/CUPOLA FURNACES 5TPH OR MORE**

1. Details of proposed layout clearly demarcating various units within the plant.
2. Complete process flow diagram describing each unit, its processes and operations, along with material and energy inputs and outputs (material and energy balance).
3. Details on design and manufacturing process for all the units.
4. Details on environmentally sound technologies for recycling of hazardous materials, as per CPCB Guidelines, may be mentioned in case of handling scrap and other recycled materials.
5. Details on requirement of raw materials, its source and storage at the plant.
6. Details on requirement of energy and water along with its source and authorization from the concerned department. Location of water intake and outfall points (with coordinates).
7. Details on toxic metal content in the waste material and its composition and end use (particularly of slag).
8. Details on toxic content (TCLP), composition and end use of chrome slag. Details on the recovery of the Ferro chrome from the slag and its proper disposal.

### **TORs COMPLIANCE**

Compliance made on TOR issued by Ministry of Environment, Forest and Climate Change (MoEF&CC) Vide letter No. J-11011 / 80 / 2008-IA-II (I)  
 dated 7<sup>th</sup> February 2017

#### **Specific TORs**

<b>TOR No.</b>	<b>TOR point raised</b>	<b>TOR Compliance</b>
i.	Public Hearing to be conducted by Chhattisgarh Environment Conservation Board	Public Hearing was conducted by CECB on 27 <sup>th</sup> November 2017.
ii.	The issues raised during public hearing and commitment of the project proponent on the same along with time bound action plan to implement the commitment and financial allocation thereto should be clearly provided.	Kindly refer to Annexure – 10 for Public Hearing proceeding. Kindly refer to <b>Page no. 7.3 to 7.11 of Chapter # 7</b> of EIA report for management reply for the issues raised during public hearing and action plan.
iii.	The project proponent should carry out Social Impact Assessment of the project as per the Office Memorandum No. J-11013/25/2014-IA.I dated 11.08.2014 issued by the Ministry regarding guidelines on Environment Sustainability and CSR issues. The Social Impact assessment study so carried should form part of EIA and EMP report.	Kindly refer to <b>Page no. 3.49 of Chapter # 3</b> of EIA report for SIA.  Kindly refer to <b>Page no. 8.2 of Chapter # 8</b> of EIA report for activities proposed under ESC along with budgetary allocation and time schedule.

#### **Generic TORs in Respect of Industry Sector**

<b>TOR No.</b>	<b>TOR point raised</b>	<b>TOR Compliance</b>
<b>1.</b>	<b>Executive Summary</b>	Kindly refer to <b>ANNEXURE - 1</b>
<b>2.</b>	<b>Introduction</b>	
	i. Details of the EIA Consultant including NABET accreditation	Kindly refer to <b>Chapter # 12 of EIA report</b>
	ii. Information about the project proponent	Kindly refer to <b>page no. 1.4 of Chapter # 1</b> of EIA report.
	iii. Importance and benefits of the project	Kindly refer to <b>page no. 1.5 of Chapter # 1</b> of EIA report.

TOR No.	TOR point raised	TOR Compliance
<b>3.</b>	<b>Project Description</b>	
	i. Cost of project and time of completion.	Kindly refer to <b>page no. 2.13 &amp; 2.14 of Chapter # 2</b> of EIA report.
	ii. Products with capacities for the proposed project.	Kindly refer to <b>page no. 2.8 of Chapter # 2</b> of EIA report.
	iii. If expansion project, details of existing products with capacities and whether adequate land is available for expansion, reference of earlier EC if any.	The proposed project is a Greenfield project.  Total land envisaged for the entire project is <b>34.26 acres/13.86 Ha.</b>  Kindly refer to <b>page no. 2.7 of Chapter # 2</b> of EIA report for land details for proposed Greenfield project.
	iv. List of raw materials required and their source along with mode of transportation	Kindly refer to <b>page no. 2.14 of Chapter # 2</b> of EIA report.  Copy of MoU for supply of Imported Coal is enclosed as <b>ANNEXURE – 8.</b>
	v. Other chemicals and materials required with quantities and storage capacities	Maximum quantity of HFO (Heavy Fuel Oil), LDO (Light Diesel Oil) & FO (Fuel Oil) stored at site will be 1 x 25 m <sup>3</sup> , 1 x 25 m <sup>3</sup> & 2 x 25 m <sup>3</sup> capacity respectively.
	vi. Details of Emission, effluents, hazardous waste generation and their management	Kindly refer to <b>page no. 4.8 of Chapter # 4</b> of EIA report for Stack emission details. Kindly refer to page no. <b>2.29 of Chapter # 2</b> of EIA report for Air Emission Management details. Kindly refer to <b>page no. 2.36 of Chapter # 2</b> of EIA report for effluent generation and its management details. Kindly refer to <b>page no. 2.39 of Chapter # 2</b> of EIA report for hazardous waste generation and its management.
	vii. Requirement of water, power, with source of supply, status of approval, water balance diagram, man-power requirement (regular	Water required for the proposed project will be sourced from Ground Water source.

TOR No.	TOR point raised	TOR Compliance
	and contract)	<p>Water requirement for proposed project will be 450 KLD. Ground Water drawl permission from CGWA has been obtained NOC no. CGWA/NOC/IND/ORIG/2018/3370. Letter is yet to be issued. Kindly refer to <b>ANNEXURE – 9 for Screenshot from CGWB website-stating NOC approved.</b></p> <p>Kindly refer to <b>page no. 4.16 &amp; 4.17 of Chapter # 4 EIA report</b> for detailed water requirement breakup and water balance diagram.</p> <p>Power required for the proposed project will be sourced partly from captive power generation &amp; partly from nearby Grid. Kindly refer to <b>page no. 2.29 of Chapter # 2</b> of EIA report Power requirement to each unit.</p> <p>Kindly refer to <b>page 8.1 of Chapter # 8</b> of EIA report for Man power requirement (regular &amp; contract)</p>
	viii. Process description along with major equipment's and machineries, process flow sheet (quantitative) from raw material to products to be provided	Kindly refer to <b>page no. 2.17 to 2.27 of Chapter # 2</b> of EIA report for process description.
	ix. Hazard identification and details of proposed safety systems	Kindly refer to <b>Page no. 7.13 to 7.20 of Chapter # 7</b> of EIA report
	x. Expansion / modernization proposals	
	a. Copy of all the Environmental Clearance(s) including Amendments thereto obtained for the project from MOEF/SEIAA shall be attached as an Annexure. A certified copy of the latest Monitoring Report of the Regional Office of the Ministry of Environment and Forests as per circular dated 30 <sup>th</sup> May, 2012 on the status of	Earlier Vikas Metaliks & Energy Limited have proposed to setup the plant at Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh and obtained Environmental Clearance vide letter no. <b>J-11011/80/2008 – IA II (I) dated 9<sup>th</sup> June 2009.</b>

TOR No.	TOR point raised	TOR Compliance
	<p>compliance of conditions stipulated in all the existing environmental clearances including Amendments shall be provided. In addition, status of compliance of Consent to Operate for the ongoing /existing operation of the project from SPCB shall be attached with the EIA-EMP report.</p>	<p>Due to non-submission of request for extension of validity of EC within the stipulated time, a fresh proposal has been submitted with a request for grant of Environmental Clearance with reduced capacities &amp; dropping of certain products. In the present proposal capacities of Sponge Iron, SMS, Power have been reduced and proposed to drop Pellet plant, BF &amp; Ferro Alloys plants.</p> <p>Kindly refer to <b>ANNEXURE - 2</b> for copy of earlier Environmental Clearance.</p>
	<p>b. In case the existing project has not obtained environmental clearance, reasons for not taking EC under the provisions of the EIA Notification 1994 and/or EIA Notification 2006 shall be provided. Copies of Consent to Establish/No Objection Certificate and Consent to Operate (in case of units operating prior to EIA Notification 2006, CTE and CTO of FY 2005-2006) obtained from the SPCB shall be submitted. Further, compliance report to the conditions of consents from the SPCB shall be submitted.</p>	<p>Not applicable</p>
<b>4.</b>	<b>Site Details</b>	
	<p>i. Location of the project site covering village, Taluka/Tehsil, District and State, Justification for selecting the site, whether other sites were considered.</p>	<p>Kindly refer to <b>page no. 2.2 of Chapter # 2</b> of EIA report for location of the project site.</p> <p>Kindly refer to <b>page no. 2.6 of Chapter # 2</b> of EIA report for Environmental Setting within 10 Km. radius of the project site.</p> <p>Kindly refer to <b>page no. 5.1 of Chapter # 5</b> of EIA report for Justification for selecting the site &amp; other Alternate sites considered.</p>

TOR No.	TOR point raised	TOR Compliance
	ii. A toposheet of the study area of radius of 10 km and site location on 1:50,000/1:25,000 scale on an A3/A2 sheet, (including all eco-sensitive areas and environmentally sensitive places)	Kindly refer to <b>page no. 2.11 of Chapter # 2</b> of EIA report.
	iii. Co-ordinates (lat-long) of all four corners of the site.	Kindly refer to <b>page no. 2.3 of Chapter # 2</b> of EIA report for coordinates of the project site.
	iv. Google map-Earth downloaded of the project site.	Kindly refer to <b>page no. 2.4 of Chapter # 2</b> of EIA report for Google Earth map showing location of the project site.
	v. Layout maps indicating existing unit as well as proposed unit indicating storage area, plant area, greenbelt area, utilities etc. If located within an Industrial area/Estate/Complex, layout of Industrial Area indicating location of unit within the Industrial area/Estate.	The proposed project is a Greenfield project. Kindly refer to <b>page no. 2.9 of Chapter # 2</b> for Plant layout showing proposed units including storage area, plant area, greenbelt area, utilities etc.
	vi. Photographs of the proposed and existing (if applicable) plant site. If existing, show photographs of plantation/greenbelt, in particular.	Kindly refer to <b>page no. 2.5 of Chapter # 2</b> of EIA report.
	vii. Landuse break-up of total land of the project site (identified and acquired), government/private - agricultural, forest, wasteland, water bodies, settlements, etc shall be included, (not required for industrial area)	Kindly refer to <b>page no. 2.7 of Chapter # 2</b> of EIA report.
	viii. A list of major industries with name and type within study area (10km radius) shall be incorporated.  Land use details of the study area	Kindly refer to <b>page no. 2.7 of Chapter # 2</b> of EIA report for major industries within 10 Km radius of the project site.  Kindly refer to <b>page no. 3.33 of Chapter # 3</b> of EIA report for land use details of the study area.
	ix. Geological features and Geo-hydrological status of the study area shall be included.	Kindly refer to <b>page no. 3.31 of Chapter # 3</b> of EIA report.
	x. Details of Drainage of the project upto 5km radius of study area. If the site is within 1 km radius of any major river, peak and lean season river discharge as well as flood occurrence frequency based on peak rainfall data of the past 30 years. Details of Flood Level of	There are no major river within 10 Kms. radius of the project. However kindly refer to <b>page no. 3.36 of Chapter # 3</b> for Drainage pattern map.

TOR No.	TOR point raised	TOR Compliance
	the project site and maximum Flood Level of the river shall also be provided, (mega green field projects)	
	xi. Status of acquisition of land. If acquisition is not complete, stage of the acquisition process and expected time of complete possession of the land.	The total land envisaged for the proposed project is under possession of the management. Kindly refer to <b>page no. 2.7 of Chapter # 2</b> of EIA report for land details.
	xii. R & R details in respect of land in line with state Government policy	Not applicable as there are no habitation in the land envisaged for the proposed project.
<b>5.</b>	<b>Forest and Wildlife related issues (if applicable)</b>	
	i. Permission and approval for the use of forest land (forestry clearance), if any, and recommendations of the State Forest Department, (if applicable)	Not applicable, as there is no forest land involved in the proposed project site.
	ii. Landuse map based on High resolution satellite imagery (GPS) of the proposed site delineating the forestland ( <i>in case of projects involving forest land more than 40 ha</i> )	Kindly refer to <b>page no. 3.34 &amp; 3.35</b> for Satellite imagery and LULC map.
	iii. Status of Application submitted for obtaining the stage I forestry clearance along with latest status shall be submitted.	Not applicable, as there is no forest land involved in the proposed Project site.
	iv. The projects to be located within 10 km of the National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals, the project proponent shall submit the map duly authenticated by Chief Wildlife Warden showing these features vis-a-vis the project location and the recommendations or comments of the Chief Wildlife Warden-thereon	Not applicable, as there no National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals within 10 Km. radius of the project site.  Kindly refer to <b>ANNEXURE – 3</b> confirming that there are no National Parks, Sanctuaries, Biosphere Reserves, Migratory Corridors of Wild Animals within 10 Km. radius of the project site.
	v. Wildlife Conservation Plan duly authenticated by the Chief Wildlife Warden of the State Government for conservation of Schedule I fauna, if any exists in the study area	Not applicable, as there are no Schedule- I fauna exists in the study area.
	vi. Copy of application submitted for clearance under the Wildlife (Protection) Act, 1972, to the Standing Committee of the National	Not applicable

TOR No.	TOR point raised	TOR Compliance
	Board for Wildlife	
<b>6.</b>	<b>Environmental Status</b>	
	i. Determination of atmospheric inversion level at the project site and site-specific micro-meteorological data using temperature, relative humidity, hourly wind speed and direction and rainfall;	Kindly refer to <b>page no. 4.2 to 4-9 of Chapter # 4</b> of EIA report.  Kindly refer to <b>page no. 3.2 of Chapter # 3</b> of EIA report.
	ii. AAQ data (except monsoon) at 8 locations for PM <sub>10</sub> , PM <sub>2.5</sub> , SO <sub>2</sub> , NO <sub>x</sub> , CO and other parameters relevant to the project shall be collected. The monitoring stations shall be based CPCB guidelines and take into account the pre-dominant wind direction, population zone and sensitive receptors including reserved forests.	Kindly refer to <b>page no. 3.5 to 3.12 of Chapter # 3</b> of EIA report.
	iii. Raw data of all AAQ measurement for 12 weeks of all stations as per frequency given in the NAQQM Notification of Nov. 2009 along with -min., max., average and 98% values for each of the AAQ parameters from data of all AAQ stations should be provided as an annexure to the EIA Report.	Kindly refer to <b>ANNEXURE – 4</b>
	iv. Surface water quality of nearby River (60m upstream and downstream) and, other surface drains at eight locations as per CPCB/MoEF&CC guidelines.	Kindly refer to <b>page no. 3.19 of Chapter # 3</b> of EIA report.
	v. Whether the site falls near to polluted stretch of river identified by the CPCB/MoEF&CC.	No, proposed site does not falls near to polluted stretch of river identified by CPCB/MoEF&CC.
	vi. Ground water monitoring at minimum at 8 locations shall be included.	Kindly refer to <b>page no. 3.20 to 3.30 of Chapter # 3</b> of EIA report.
	vii. Noise levels monitoring at 8 locations within the study area.	Kindly refer to <b>page no. 3.15 to 3.18 of Chapter # 3</b> of EIA report.
	viii. Soil Characteristic as per CPCB guidelines	Kindly refer to <b>page no. 3.37 to 3.40 of Chapter # 3</b> of EIA report.
	ix. Traffic study of the area, type of vehicles, frequency of vehicles for transportation of materials, additional traffic due to proposed	Kindly refer to <b>page no. 4.21 to 4.23 of Chapter # 4</b> of EIA report for Traffic Study.

TOR No.	TOR point raised	TOR Compliance
	project, parking arrangement etc.	
	x. Detailed description of flora and fauna (terrestrial and aquatic) existing in the study area shall be given with special reference to rare, endemic and endangered species. If Schedule-I fauna are found within the study area, a Wildlife Conservation Plan shall be prepared and furnished.	Kindly refer to <b>page no. 3.41 to 3.49 of Chapter # 3</b> of EIA report for detailed description of flora and fauna (terrestrial and aquatic) existing in the study area
	xi. Socio-economic status of the study area	Kindly refer to <b>page no. 3.49 to 3.68 of Chapter # 3</b> of EIA report for details Socio Economic Study. Kindly refer to the <b>ANNEXURE – 5</b> for demographics details of the study area.
<b>7.</b>	<b>Impact Assessment and Environment Management Plan</b>	
	i. Assessment of ground level concentration of pollutants from the stack emission based on site-specific meteorological features. In case the project is located on a hilly terrain, the AQIP Modelling shall be done using inputs of the specific terrain characteristics for determining the potential impacts of the project on the AAQ. Cumulative impact of all sources of emissions (including transportation) on the AAQ of the area shall be well assessed. Details of the model used and the input data used for modeling shall also be provided. The air quality contours shall be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any.	Kindly refer to <b>page no. 4.2 to 4.9 of Chapter # 4</b> of EIA report.  Kindly refer to <b>page no. 4.9 to 4.15</b> for Ground level concentrations & Air Quality isopleths.
	ii. Water Quality modelling - in case, if the effluent is proposed to be discharged in to the local drain, then Water Quality Modelling study should be conducted for the drain water taking into consideration the upstream and downstream quality of water of the drain.	There will be no effluent discharge from the DRI plant, Induction Furnace & Rolling mill as closed circuit cooling system will be adopted. Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary waste water will be treated in septic tank followed by sub-surface dispersion

TOR No.	TOR point raised	TOR Compliance
		trench.
	iii. Impact of the transport of the raw materials and end products on the surrounding environment shall be assessed and provided. In this regard, options for transport of raw materials and finished products and wastes (large quantities) by rail or rail-cum road transport or conveyor-cum-rail transport shall be examined.	Kindly refer to <b>page no. 4.21 of Chapter # 4</b> of EIA report.
	iv. A note on treatment of wastewater from different plant operations, extent recycled and reused for different purposes shall be included. Complete scheme of effluent treatment. Characteristics of untreated and treated effluent to meet the prescribed standards of discharge under E(P) Rules.	Kindly refer to <b>page no. 2.36 of Chapter # 2</b> of EIA report.
	v. Details of stack emission and action plan for control of emissions to meet standards.	Kindly refer to <b>page no. 4.8 of Chapter # 4</b> of EIA report for Stack emission details. Kindly refer to <b>page no. 2.29 of Chapter # 2</b> of EIA report for control of emissions to meet standards.
	vi. Measures for fugitive emission control	Kindly refer to <b>page no.2.35 of Chapter # 2</b> of EIA report.
	vii. Details, of hazardous waste generation and their storage, utilization and disposal. Copies of MOU regarding utilization of solid and hazardous waste shall also be included. EMP shall include the concept of waste-minimization, recycle/reuse/recover techniques, Energy conservation, and natural resource conservation.	Kindly refer to <b>page no. 2.38 of Chapter # 2</b> of EIA report.  Kindly refer to <b>ANNEXURE – 6</b> for expression of Interest letters from M/s. Ultratech Cement for utilisation of Ash.
	viii. Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 2009. A detailed plan of action shall be provided.	Kindly refer to <b>ANNEXURE – 6</b> for expression of Interest letters from M/s. Ultratech Cement for utilisation of Ash
	ix. Action plan for the green belt development plan in 33 % area i.e. land with not less than 1,500 trees per ha. Giving details of species, width of plantation, planning schedule etc. shall be included. The green belt shall be around the project boundary and a scheme for greening of the roads used for the project shall also be	Kindly refer to <b>page no.10.15 to 10.17 of Chapter # 10</b> of EIA report.

TOR No.	TOR point raised	TOR Compliance
	incorporated.	
	x. Action plan for rainwater harvesting measures at plant site shall be submitted to harvest rainwater from the roof tops and storm water drains to recharge the ground water and also to use for the various activities at the project site to conserve fresh water and reduce the water requirement from other sources.	Kindly refer to <b>page no.10.18 of Chapter # 10</b> of EIA report.
	xi. Total capital cost and recurring cost/annum for environmental pollution control measures shall be included.	Kindly refer to <b>page no.10.20 of Chapter # 10</b> of EIA report.  Kindly refer to <b>page no.9.1 of Chapter # 9</b> of EIA report for break-up of budget for environmental protection measures.
	xii. Action plan for post-project environmental monitoring shall be submitted.	Kindly refer to <b>page no.10.19 of Chapter # 10</b> of EIA report.
	xiii. Onsite and Offsite Disaster (Natural and Man-made) Preparedness and Emergency Management Plan including Risk Assessment and damage control. Disaster management plan should be linked with District Disaster Management Plan.	Kindly refer to <b>page no. 7.13 of Chapter # 7</b> of EIA report.
<b>8.</b>	<b>Occupational Health</b>	
	i. Details of existing Occupational & Safety Hazards. What are the exposure levels of above mentioned hazards and whether they are within Permissible Exposure level (PEL). If these are not within PEL, what measures the company has adopted to keep them within PEL so that health of the workers can be preserved,	Kindly refer to <b>page no. 7.31 to 7.33 of Chapter # 7</b> of EIA report.
	ii. Details of exposure specific health status evaluation of worker. If the workers' health is being evaluated by pre designed format, chest x rays, Audiometry, Spirometry, Vision testing (Far & Near vision, colour vision and any other ocular defect) ECG, during pre-placement and periodical examinations give the details of the same. Details regarding last month analyzed data of	NOT APPLICABLE AS IT'S A GREENFIELD PROEJCT.  However Medical records of each employee will be maintained separately and will be updated as per finding during monitoring. Age, sex wise, department wise data on the above parameters will be maintained and

<b>TOR No.</b>	<b>TOR point raised</b>	<b>TOR Compliance</b>
	abovementioned parameters as per age, sex, duration of exposure and department wise.	submitted to the ministry.  Medical records of the employee at the end of his / her term will be updated.
	iii. Annual report of health status of workers with special reference to Occupational Health and Safety.	NOT APPLICABLE AS IT'S A GREENFIELD PROEJCT.
	iv. Plan and fund allocation to ensure the occupational health & safety of all contract and casual workers.	Kindly refer to <b>page no. 7.33 of Chapter # 7 &amp; page no. 9.1 of Chapter # 9</b> of EIA report.
<b>9.</b>	<b>Corporate Environment Policy</b>	
	i. Does the company have a well laid down Environment Policy approved by its Board of Directors? If so, it may be detailed in the EIA report.	Kindly refer to <b>ANNEXURE - 7</b>
	ii. Does the Environment Policy prescribe for standard operating process / procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? If so, it may be detailed in the EIA.	
	iii. What is the hierarchical system or Administrative order of the company to deal with the environmental issues and for ensuring compliance with the environmental clearance conditions? Details of this system may be given.	
	iv. Does the company have system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the company and / or shareholders or stakeholders at large? This reporting mechanism shall be detailed in the EIA report	
10.	Details regarding infrastructure facilities such as sanitation, fuel, restroom etc. to be provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase.	Kindly refer to <b>page no. 10.2 of Chapter # 10</b> of EIA report.
<b>11.</b>	<b>Enterprise Social Commitment (ESC)</b>	

TOR No.	TOR point raised	TOR Compliance
	i. Adequate funds (atleast 2.5 % of the project cost) shall be earmarked towards the Enterprise Social Commitment based on Public Hearing issues and item-wise details along with time bound action plan shall be included." Socio-economic development activities need to be elaborated upon.	Kindly refer to <b>page no. 8.2 of Chapter # 8</b> of EIA report for detailed ESC
12.	Any litigation pending against the project and / or any direction / order passed by any Court of Law against the project, if so, details thereof shall also be included. Has the unit received any notice under the Section 5 of Environment (Protection) Act, 1986 or relevant Sections of Air and Water Acts? If so, details thereof and compliance / ATR to the notice(s) and present status of the case.	No litigation is pending against the project and / or any direction / order passed by any Court of Law against the project.
13.	A tabular chart with index for point wise compliance of above TORs	Noted
14.	The TORs prescribed shall be valid for a period of three years for submission of the EIA-EMP reports along with Public Hearing Proceedings (wherever stipulated).	Noted

**Additional TORs for INDUCTION / ARC FURNACES / CUPOLA FURNACES 5 TPH OR MORE – [ANNEXURE - 2]**

TOR No	TOR Points	Compliance to TOR
1	Details of proposed layout clearly demarcating various units within the plant.	Kindly refer to <b>page no. 2.9 of Chapter # 2</b> for Plant layout showing proposed units including storage area, plant area, greenbelt area, utilities etc.
2	Complete process flow diagram describing each unit, its processes and operations, along with material and energy inputs and outputs (material and energy balance).	Kindly refer to <b>page no. 2.17 to 2.28 of Chapter # 2</b> of EIA report for Complete process flow diagram describing each unit, its processes and operations.  Kindly refer to <b>page no. 2-15 of Chapter # 2</b> of EIA report for material balance.
3	Details on design and manufacturing process for all the units.	Kindly refer to <b>page no. 2-17 to 2-28 of Chapter # 2</b> of EIA report.

4	Details on environmentally sound technologies for recycling of hazardous materials, as per CPCB Guidelines, may be mentioned in case of handling scrap and other recycled materials.	Kindly refer to <b>page no. 2.38 of Chapter # 2</b> of EIA report.
5	Details on requirement of raw materials, its source and storage at the plant.	Kindly refer to <b>page no. 2-14 of Chapter # 2</b> of EIA report.
6	Details on requirement of energy and water along with its source and authorization from the concerned department. Location of water intake and outfall points (with coordinates).	<p>Water required for the proposed project will be sourced from Ground Water source.  Water requirement for proposed project will be 450 KLD.</p> <p>Ground Water drawl permission from CGWA has been obtained NOC no. CGWA/NOC/IND/ORIG/2018/3370. Letter is yet to be issued.  Kindly refer to <b>ANNEXURE – 9 for Screenshot from CGWB website</b> stating NOC approved.</p> <p>Power required for the proposed project will be sourced partly from captive power generation &amp; partly from nearby Grid. Kindly refer to <b>page no. 2.29 of Chapter # 2</b> of EIA report Power requirement to each unit.</p>
7	Details on toxic metal content in the waste material and its composition and end use (particularly of slag).	Kindly refer to <b>page no. 2.38 of Chapter # 2</b> of EIA report.
8	Details on toxic content (TCLP), composition and end use of chrome slag. Details on the recovery of the Ferro chrome from the slag and its proper disposal.	Not applicable as there is no chrome slag generation from the proposed project.

# CHAPTER – 1

## INTRODUCTION



### 1.1 PURPOSE OF THE REPORT

Environmental management plays a vital role in sustainable development of a country. Recognizing its importance, the Ministry of Environment and Forest, Government of India had formulated policies and procedures governing the industrial and other developmental activities to prevent indiscriminate exploitation of natural resources and to promote integration of environmental concern in developmental projects.

Ministry of Environment, Forest & Climate Change (MoEF&CC) has made prior Environmental Clearance (EC) for certain developmental projects mandatory through its notification issued on 14<sup>th</sup> September 2006 and its subsequent amendment.

Environmental Impact Assessment (EIA) is systematic process to identifying, predicting, evaluating and mitigating the biophysical, social and other relevant environmental effects due to the proposed developmental project. It plays a vital role in providing information for decision-making on the environmental consequences of proposed projects. It promotes environmentally sound and sustainable development through the identification appropriate enhancement and mitigation measures.

The proposed project activity has both positive and negative impacts on the environment. The negative impacts include environmental degradation and adverse socio economic changes. It is the responsibility of the company to document the associated positive and negative impacts, so that the attempts can be made to minimize the effects due to the negative impacts and maximize the benefits due to the positive impacts. In this regards, Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) have been considered as the most important documentation in understanding the environmental implications and safeguarding the environment.

## **1.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT**

India is on a threshold of a steel revolution. The National Steel Policy envisages production of 110 million ton per annum (MTPA) of steel in India by the year 2020. This implies that the country, which produces 40 MTPA of steel currently, will have to add around 70 MTPA of new steel making capacity in the next 10 to 11 years. This translates into addition of more than 6 MTPA of steel making capacity every year till 2020. On a national level, a multi-pronged strategy has been formulated for attaining this goal. The demand for steel will increase through rapid infrastructural development and a quantum increase in rural steel consumption. Keeping pace with the demand, domestic steel production will be enhanced through creation of additional capacity. The expansion plans of existing steel producers and entry of new players are all indicative of a very bright future for steel industry. The National Steel Policy has set a long-term goal that India should have a modern and efficient steel industry of world standards, catering to diversified steel demand. The focus of the policy is to achieve global competitiveness not only in terms of cost, quality and product-mix but also in terms of global benchmarks of efficiency and productivity.

### **About the Project**

VIKAS METALIKS & ENERGY LIMITED have proposed to setup the plant at Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh and obtained Environmental Clearance vide letter no. J-11011/80/2008 – IA II (I) dated 9<sup>th</sup> June 2009.

Now, as per the EIA notification 2006 and its amendments, the validity period of Environmental Clearance issued vide letter no. J-11011/80/2008 – IA II (I) dated 9<sup>th</sup> June 2009 has been expired as on 8<sup>th</sup> June 2016. In view of the same, now the management has applied for issue of NEW Environmental Clearance.

Now it has been Proposed to install Sponge Iron Plant of 1,20,000 TPA (Reducing from 2,55,000 TPA to 1,20,000 TPA) capacity, Induction furnace with CCM & LRF of 1,35,000 TPA (Reducing from 1,80,000 TPA to 1,35,000 TPA) capacity, Rolling Mill of 90,000 TPA (no change) capacity, Power Plant through WHRB of 8 MW (reducing from 18 MW to 8 MW) capacity, Power Plant through FBC Boiler of 8 MW (Reducing from 15 MW to 8 MW) capacity & dropping of Pellet Plant, Blast Furnace, Ferro Alloy unit].

As per the Ministry of Environment, Forests & Climate Change, New Delhi, EIA notification dated 14<sup>th</sup> September, 2006 & its subsequent amendments, all Primary metallurgical processing industries are listed under S.No. 3(a), under Category 'A'.

In order to obtain Environmental Clearance for the proposed Steel plant, Form-1, proposed TOR along with Pre-Feasibility Report were submitted to the Honourable Ministry of Environment, Forests & Climate Change (MoEF&CC), New Delhi. Presentation was made before the Expert Appraisal Committee of MoEF&CC on 23<sup>rd</sup> November 2016 for the approval of TOR (Terms of Reference) for EIA study. Subsequently TOR letter was issued vide letter No. J-11011/80/2008-IA II (I) dated 7<sup>th</sup> February 2017. Draft EIA report has been prepared incorporating the Terms of Reference & submitted for Public hearing / consultation and Public hearing / consultation was conducted by Chhattisgarh Environment Conservation Board (CECB) on 27<sup>th</sup> November 2017. Final EIA is prepared incorporating proceeding of the Public hearing / consultation and reply by the management to queries raised during Public hearing.

*Pioneer Enviro Laboratories & Consultants Private Limited, Hyderabad*, which is accredited by NABET, Quality Council of India, vide certificate No. NABET/ EIA/ 1619/ RA 026, for preparing Environmental Impact Assessment (EIA) report for Metallurgical Unit, have prepared EIA report for the proposed project.

This report furnishes the details of location of Site, Description of the project, prevailing baseline status w.r.t Air Environment, Water Environment, Noise Environment, Land Environment, Flora & Fauna and Socio-economic environment. This report also helps in identification of environmental impacts and suggesting mitigation measures to be followed during Construction and Operation of the proposed project as a part of Environmental Management Plan. This report also acts as guidance manual for the proponent for following the Environmental Management Plan (EMP) and for adopting post project Environmental Monitoring Program as per statutory norms.

**About Project Proponent [Gen. TOR # 2 – ii]**

Vikas Metaliks And Energy Limited is a Public incorporated on 25 November 2004. It is classified as Non-govt company and is registered at Registrar of Companies, Chhattisgarh. It is involved in Manufacture of Basic Iron & Steel.

Directors of Vikas Metaliks And Energy Limited are Shri. Umesh Sharma, Shri. Manoj Kumar Sharma and Smt. Laxmi Devi.

Vikas Metaliks And Energy Limited's Corporate Identification Number is (CIN) U27102CT2004PLC017119 and its registration number is 17119. Its Email address is vspower@rediffmail.com and its registered address is F-7, Modern Complex, Moti Bagh Chowk, Raipur 492001.

Delivering superior quality, cementing strong relationships with clients and end-users, constantly striving to build a better enduring world is the moto of management.

**VISION**

- To create a product par excellence using cutting-edge technology blended with an in-depth knowledge on the same.
- To certify sustainable high quality standards in congruence with our expanding scope of operations and in adherence with environmental standards.
- To strive towards maintaining customer satisfaction and product quality at all times.

**MISSION**

- To internalize the pursuit of 'Quality' into the framework of the organization.
- To epitomize 'Quality' in all our actions, reflecting in our sincere efforts, intelligent direction and skillful execution towards our products, clients, vendors and our employees.
- Consolidate our strengths with greater achievements in quality without compromising on environmental standards.

**1.3 BRIEF DESCRIPTION**

**1.3.1 NATURE OF THE PROJECT**

Vikas Metaliks And Energy Limited proposing to establish steel plant at Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh. The proposed Steel Plant will produce the following products:

Unit	:	Description
DRI Kiln	:	Manufacturing of Sponge Iron using Iron Ore, Dolomite, Limestone and Coal as raw materials
Induction Furnace	:	Manufacturing of MS Billets using Sponge Iron, Scrap, Ferro Alloys as raw materials
Rolling Mill	:	Manufacturing of Rolled Product using MS Ingots / Steel Billets. By utilizing Producer Gas / Furnace oil as fuel.
Power generation	:	By utilizing hot waste flue gases from DRI kilns in WHRB. By utilizing coal / Dolochar in FBC boiler as fuel.

**1.3.2 SIZE OF THE PROPOSED PROJECT**

The proposed Steel Plant envisages manufacturing of the following products

**TABLE 1.1**

S.No.	Details		Plant Configuration	Production Capacity
1.	DRI Kilns		4 x 100 TPD	1,20,000 TPA
2.	Induction furnace with CCM & LRF		3 x 15 MT/heat	1,35,000 TPA
3.	Rolling Mill		1 x 300 TPD	90,000 TPA
4.	Power Generation	WHRB	4 x 2 MW	8 MW
		FBC Boiler (40 TPH)	---	8 MW

**1.3.3 LOCATION OF THE PROJECT**

The proposed project site is located at Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh and the proposed project will be taken up in an area of 34.26 acres / 13.86 Ha. The entire project area will fall in the Survey of India Topo sheet no. 64 G/10,11,14 & 15.

**1.3.4 IMPORTANCE OF PROJECT [Gen. TOR # 2 – iii]**

- Steel has been regarded as the most useful product for mankind.
- It reaches every home, and has a wide range of applications from a small pin to the manufacture of automobiles, building of the railway systems, ships, big construction projects, housing, oil rigs, nuclear power stations and so on.

- All these products play a key role in the growth of a country's more important sectors like construction, power, oil and gas, engineering, railway and road transportation, port, irrigation etc.

**Benefits :**

- Developmental activities will be carried out in the villages under CSR activities.
- The proposed expansion will generate lot of employment opportunities for the local people apart from several indirect benefits.
- During the construction of the plant it is expected that about 500 persons will get an employment directly or indirectly whereas during operation about 200 persons will be benefited.

**1.4 SCOPE OF THE STUDY**

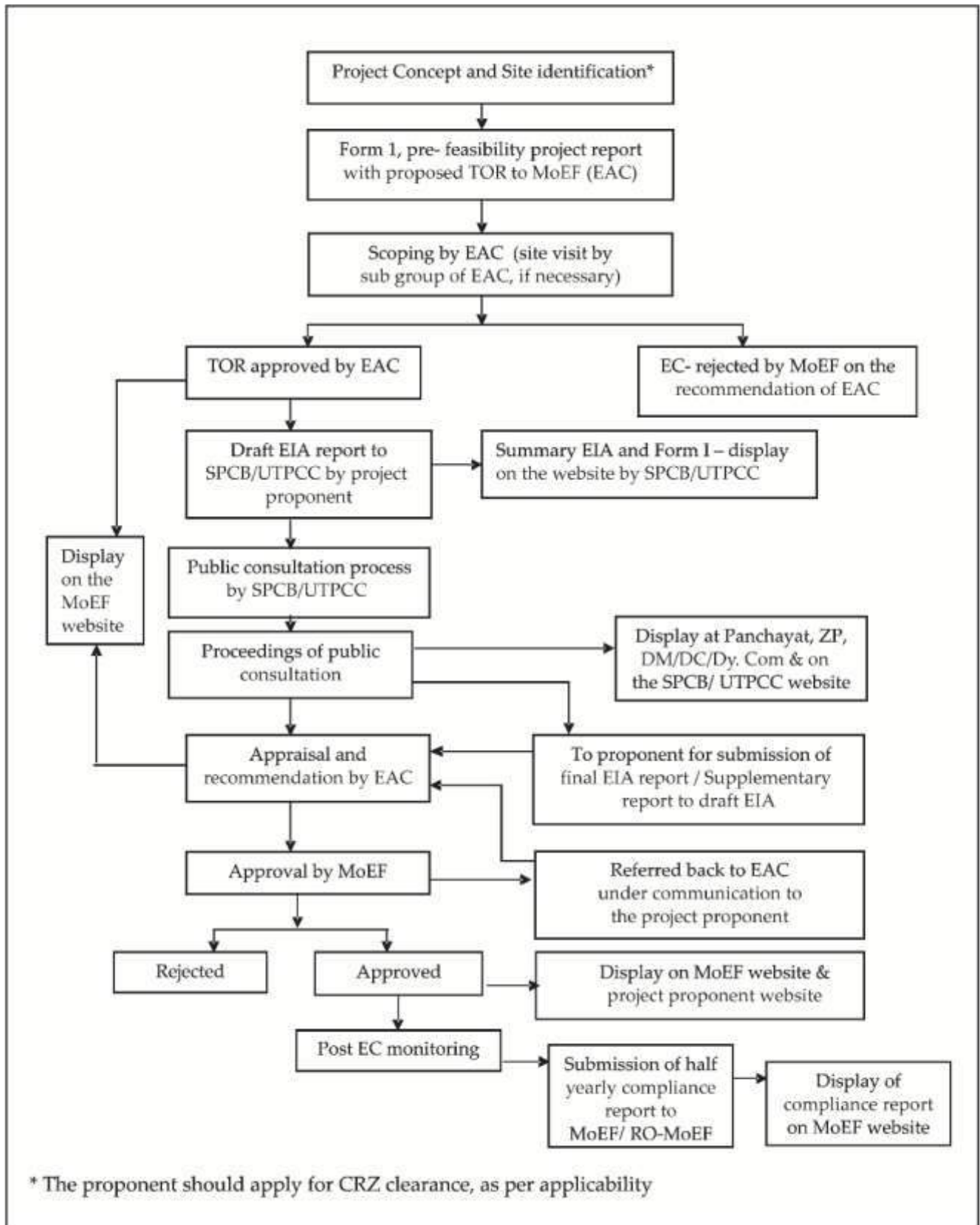
The scope of work includes a detailed characterization of the environment in an area of 10 Km. radius of the project site for various environmental parameters like Air, Water, Noise, Land, Biological and Social-economic aspects.

The EIA Report is prepared in accordance with the Terms of Reference issued vide by the Honourable Ministry of Environment, Forests & Climate Change, New Delhi.

Generic Structure of the Environmental Impact Assessment (EIA) report as per the EIA notification of the MoEF&CC, GoI dated 14<sup>th</sup> September 2006 and its subsequent amendments is detailed below:

<b>Ch. No.</b>	<b>Heading</b>
1.	Introduction
2.	Project Description
3.	Description of the Environment
4.	Anticipated Environmental Impact & Mitigation Measures
5.	Analysis of Alternatives (Technology & Site)
6.	Environmental Monitoring Program
7.	Additional Studies
8.	Project Benefits
9.	Environmental Cost – Benefit Analysis
10.	Environmental Management Plan (EMP)
11.	Summary & Conclusion
12.	Disclosure of Consultant engaged

**1.5 ENVIRONMENTAL CLEARANCE PROCESS (Category – A Project)**



## CHAPTER – 2

# PROJECT DESCRIPTION



### 2.1 TYPE OF PROJECT

Vikas Metaliks And Energy Limited proposing to establish steel plant envisage to produce the following product through different routes:

Unit	:	Description
DRI Kiln	:	Manufacturing of Sponge Iron using Iron Ore, Dolomite, Limestone and Coal as raw materials
Induction Furnace	:	Manufacturing of MS Billets using Sponge Iron, Scrap, Ferro Alloys as raw materials
Rolling Mill	:	Manufacturing of Rolled Product using MS Ingots / Steel Billets. By utilizing Producer Gas / Furnace oil as fuel.
Power generation	:	By utilizing hot waste flue gases from DRI kilns in WHRB. By utilizing coal / Dolocharin FBC boiler as fuel.

### 2.2 NEED FOR THE PROJECT

The Indian steel industry have entered into a new development stage from 2005-06, riding high on the resurgent economy and rising demand for steel. Rapid rise in production has resulted in India becoming the 5<sup>th</sup> largest producer of steel. In the last 5 years, the production and consumption of steel has grown at exceeding rates of 9% per annum. The pace of growth has further accelerated in the current year to over 10%.

It has been estimated by certain major investment houses, such as Credit Suisse that, India's steel consumption will continue to grow at nearly 16% rate annually, till 2012, fueled by demand for construction projects worth US\$ 1 trillion. The scope for raising the total consumption of steel is huge, given that per capita steel consumption is only 40 kg – compared to 150 kg across the world and 250 kg in China.

The National Steel Policy has envisaged steel production to reach 110 million tonnes by 2019-20. However, based on the assessment of the current ongoing projects, both in Greenfield and Brownfield, Ministry of Steel has projected that the steel capacity in the county is likely to be 124.06 million tonnes by 2011-12. Further, based on the status of

MOUs signed by the private producers with the various State Governments, it is expected that India's steel capacity would be nearly 293 million tonne by 2020.

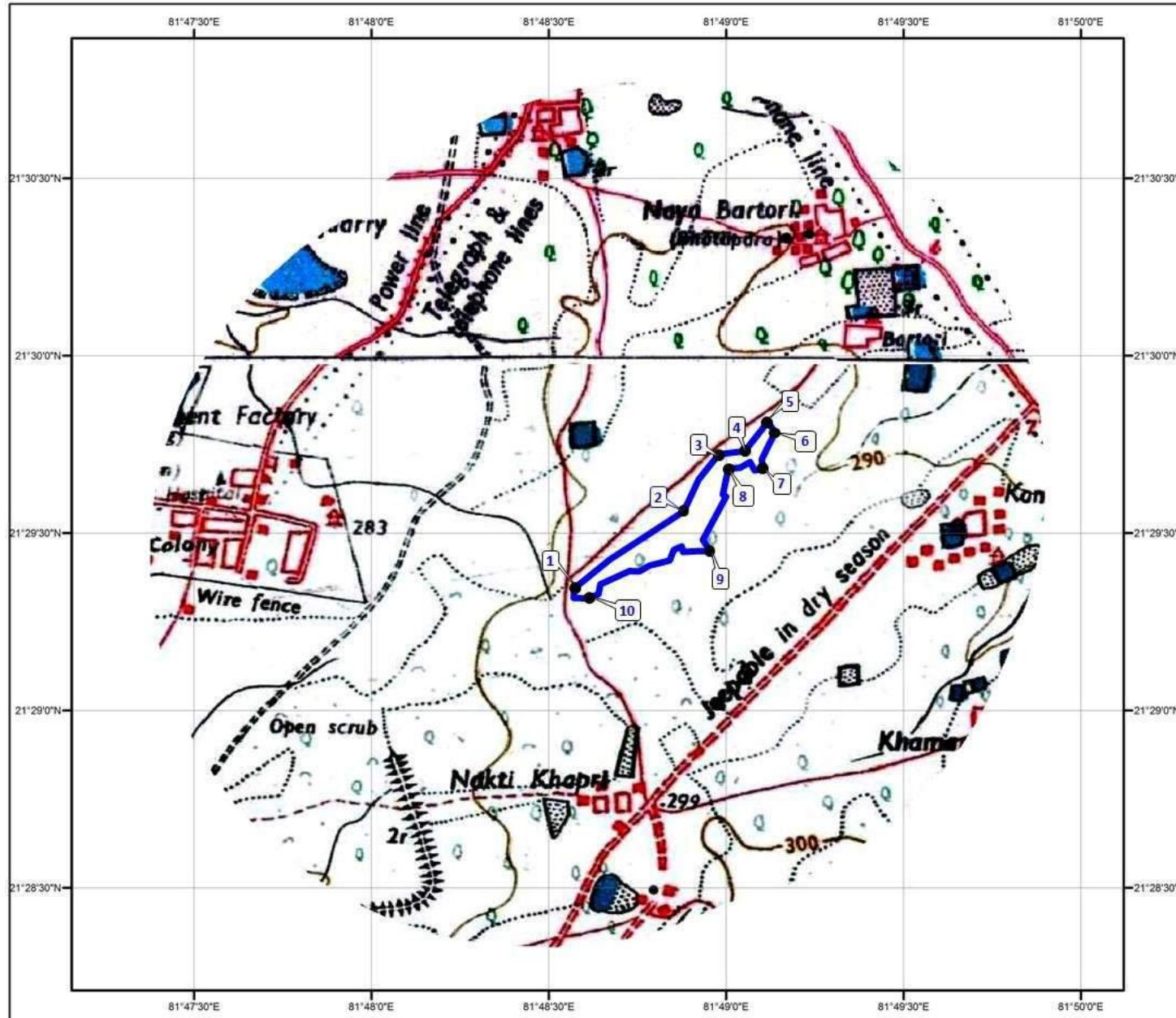
In the light of the above scenario, Vikas Metaliks And Energy Limited has proposed to set up a steel plant.

### 2.3 LOCATION OF THE PROJECT **[Gen. TOR # 4 (i)]**

Vikas Metaliks And Energy Limited is proposing to establish a steel plant at Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh. It has been proposed to install a Sponge Iron Plant of 1,20,000 TPA capacity, Induction furnace with CCM & LRF of 1,35,000 TPA capacity, Rolling Mill of 90,000 TPA capacity, Power Plant through WHRB of 8 MW capacity, Power Plant through FBC Boiler of 8 MW. The proposed project will be taken up in an area of **34.26 acres / 13.86 Ha.**

The Coordinates of the project site are following: **[Gen. TOR # 4 (iii)]**

S.No.	Coordinates
1.	21°29'26.39"N,81°48'27.46"E
2.	21°29'37.72"N,81°48'44.79"E
3.	21°29'46.40"N,81°48'50.53"E
4.	21°29'47.02"N,81°48'54.79"E
5.	21°29'51.69"N,81°48'58.84"E
6.	21°29'50.07"N,81°49'0.16"E
7.	21°29'44.41"N,81°48'57.94"E
8.	21°29'44.24"N,81°48'52.16"E
9.	21°29'31.83"N,81°48'49.09"E
10.	21°29'24.78"N,81°48'29.82"E



2 Km RADIUS  
 TOPO MAP  
 SHOWING SITE  
 SURROUNDINGS

0.2 0.1 0 0.2 0.4 0.6 0.8  
 Kilometers

1 centimeter = 256 meters

**LEGEND**

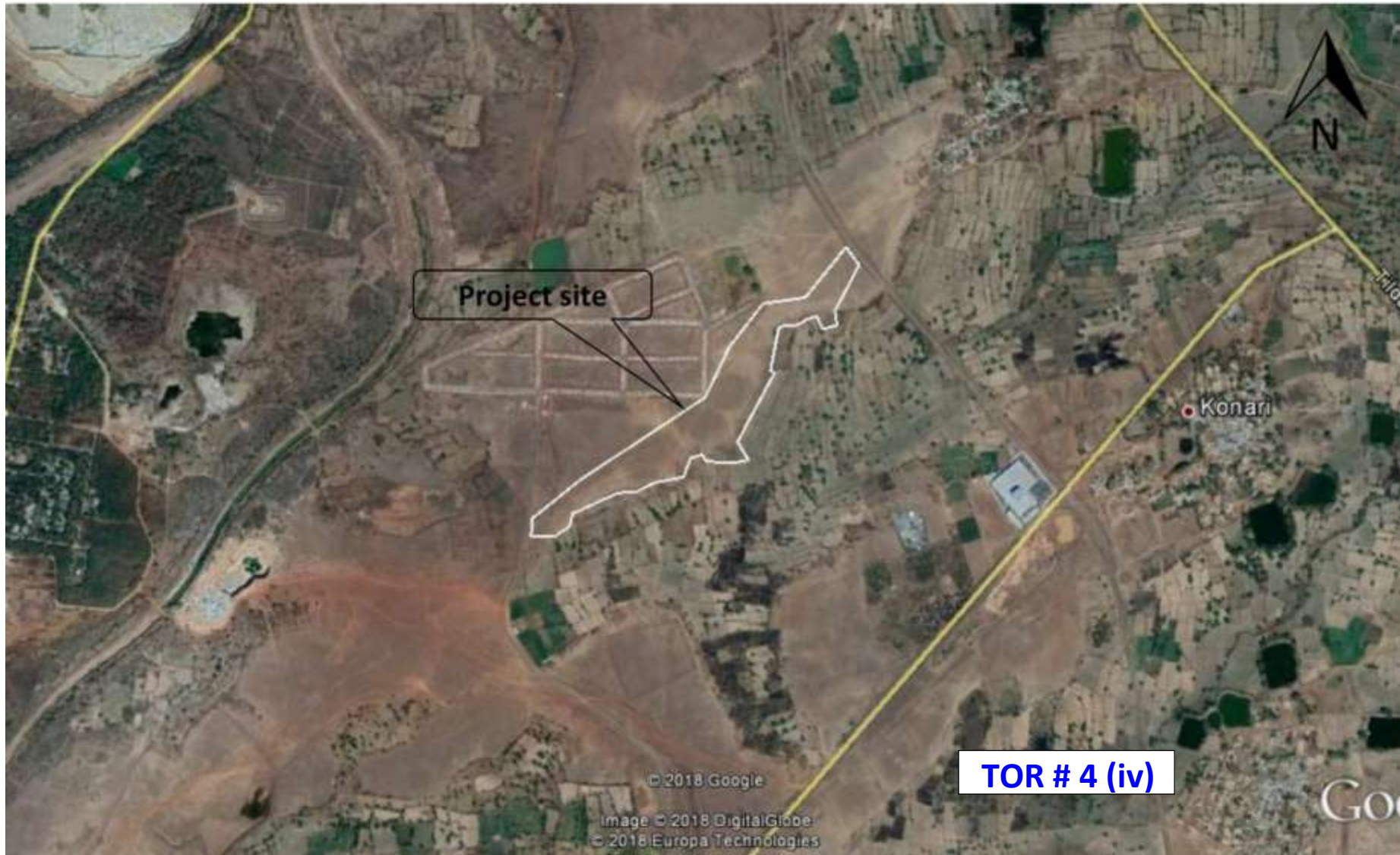
- GPS POINTS
- PLANT SITE BOUNDARY

- GPS CO-ORDINATES**
1. 21°29'26.39"N, 81°48'27.46"E
  2. 21°29'37.72"N, 81°48'44.79"E
  3. 21°29'46.40"N, 81°48'50.53"E
  4. 21°29'47.02"N, 81°48'54.79"E
  5. 21°29'51.69"N, 81°48'58.84"E
  6. 21°29'50.07"N, 81°49'0.16"E
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  8. 21°29'44.24"N, 81°48'52.16"E
  9. 21°29'31.83"N, 81°48'49.09"E
  10. 21°29'24.78"N, 81°48'29.82"E

**TOR # 4 (iii)**

Source:-  
 Survey of India Topographical Maps,  
 No.s. 64 G/10,11,14 and 15.

Project site on Google Earth



Photographs of the Project Site

**Gen. TOR # 4 (vi)**



**2.3.1 ENVIRONMENTAL SETTING WITHIN 10 Km. RADIUS OF THE PROJECT SITE**

**[Gen. TOR # 4 (i)]**

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Uncultivated land
2.	Type of Land (Study Area)	As per LULC the land use within 10 Km. is as follows:  Settlements – 7.3 %; Industrial Area-3.3 %; Tank / River / Reservoir / Major canalets – 4.6 %; Scrub Forest – 1.2 %; Single crop – 59.2 %; Double crop – 5.4 %; Plantation – 2.4 %; Land with scrub – 9.2 %; Land without scrub – 3.1 %; Sheet rock area – 0.9 %; Mining area – 3.4 %
3.	National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	Nil
4.	Historical places / Places of Tourist importance / Archeological sites	Nil
5.	Critically polluted area as per MoEF&CC Office Memorandum dated 13 <sup>th</sup> January 2010	Nil
6.	Defence Installations	Nil
7.	Nearest village	Bartori – 0.4 Km.
8.	No. of Villages in the Study Area	50
9.	Nearest Hospital	Tilda – 5.4Kms.(NNW)
10.	Nearest School	Tilda – 5.4 Kms.(NNW)
11.	Forests	Bilari RF (9.8 Kms.) No forest land is involved in the proposed project site.
12.	Water body	Jamuniyanala– 1.5Kms. MahanadiBhatapara Branch Canal – 0.6 Kms. No River / Stream passes through the proposed project site.
13.	Nearest Highway	Nil
14.	Nearest Railway Station	Baikunth R S – 2.9Kms
15.	Nearest Port facility	Nil
16.	Nearest Airport	Nil
17.	Nearest Interstate Boundary	Nil
18.	Seismic zones as per IS-1893	Seismic zone – II
19.	R & R	There is no rehabilitation and resettlement issue, as there are no habitations present in the site area.

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
20.	Litigation / court case is pending against the proposed project / proposed site and or any direction passed by the court of law against the project	Nil

### 2.3.2 LIST OF INDUSTRIES WITHIN 10 Km. RADIUS OF THE PROJECT SITE [TOR # 4 – viii]

Following is list of industries (Major) presently located within 10 Km radius of the site:

S.No.	Name of Industry	Type of Industry	Capacity / Unit
1.	M/s. Hitech Power & Steel Pvt. Ltd.	Steel Plant	200 TPD Sponge Iron, 1 x 10 MT & 2 x 8 MT Induction Furnace 1 x 500 TPD Rolling Mill, WHRB (4 MW) & FBC (6 MW)
2.	M/s. Mahendra Sponge & Power Ltd. (Unit – II)	Steel Plant	90 TPD Sponge Iron
3.	M/s. Century Textiles & Industries Ltd. (Unit : Century Cement)	Mining & Cement Plant	1.2 MTPA Limestone Mine & 2.1 MTPA Cement Plant
4.	M/s. Shri Bajrang Power & Ispat Ltd.	Steel Plant	2.0 MTPA Iron ore beneficiation, 1.4 MTPA Pellet Plant, 4 x 500 TPD Sponge Iron, 34 MW WHRB & 50 MW FBC
5.	M/s. GMR Chhattisgarh Energy Ltd.	Power Plant	2 x 685 MW Thermal Power Plant

### 2.4 DETAILS OF LAND [Gen. TOR # 3 (iii), 4 (vii) & 4 (xi)]

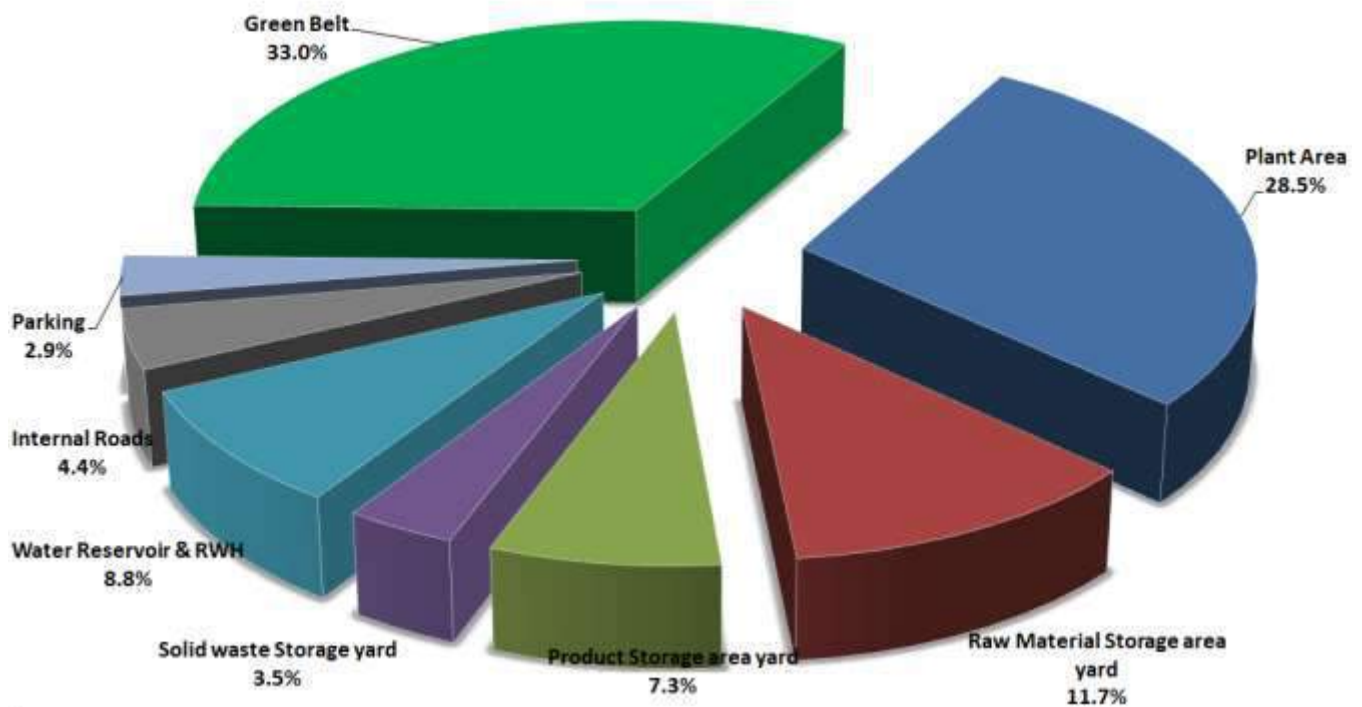
Project site is located at Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh.

The total land acquired for the proposed project will be 34.26 acres / 13.86 Ha. Khasra nos. involved in project site are 149/5, 6, 8, 9, 10, 15, 16, 20, 21, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 158/1, 158/3, 180, 181/3, 215, 217/3. Total land is in possession of management.

Following is the land use statement:

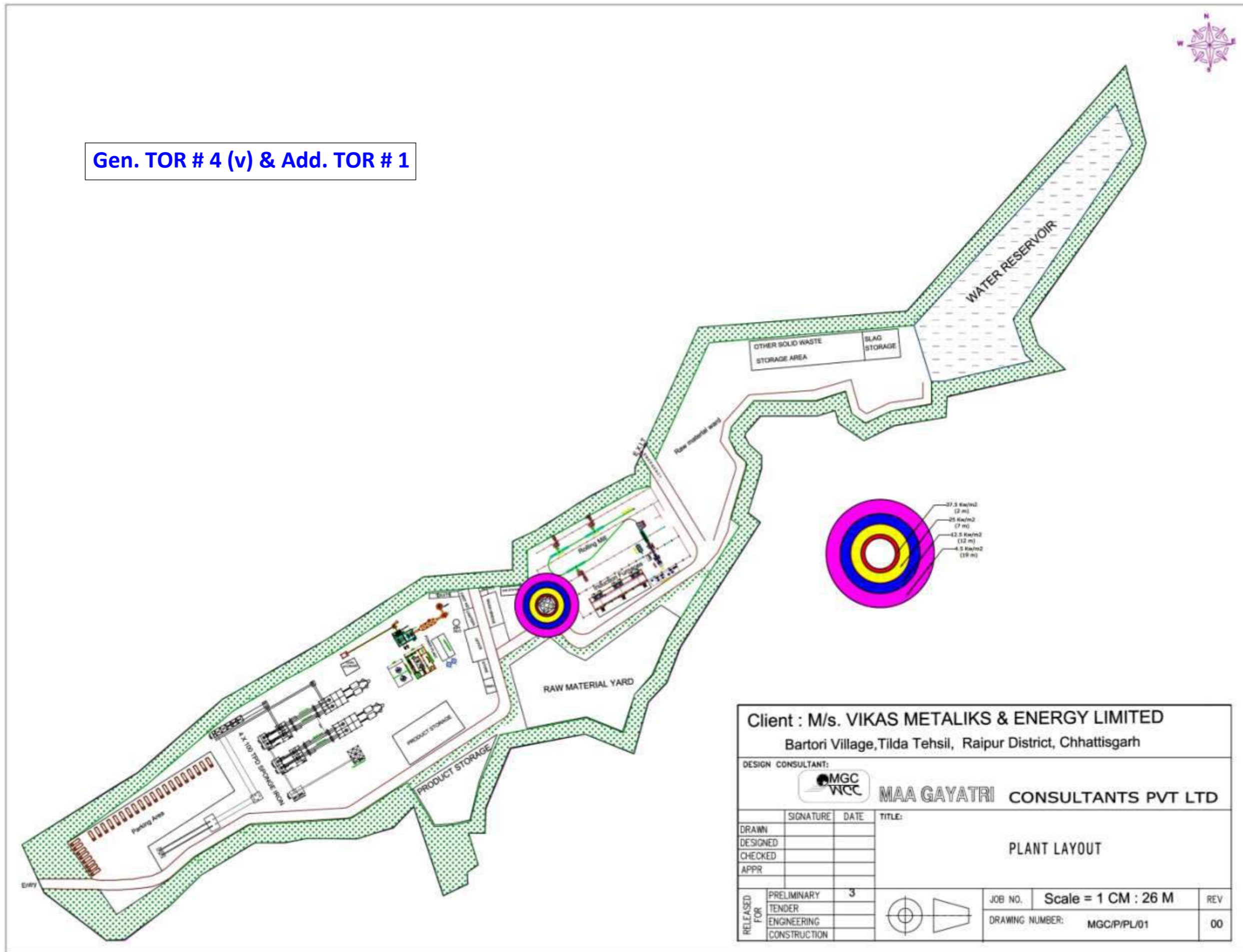
S.No.	Land Use	Area (in Acres)	Area (in Ha.)
1.	Plant area	9.76	3.95
2.	Raw Material Storage yard	4.0	1.62
3.	Product Storage yard	2.5	1.01
4.	Solid waste Storage yard	1.2	0.49
5.	Internal roads	1.5	0.61
6.	Greenbelt	11.3	4.57
7.	Water Reservoir& RWH	3.0	1.21
8.	Parking area	1.0	0.40
	<b>Total</b>	<b>34.26</b>	<b>13.86</b>

**Pie Diagram – Land Use Statement**



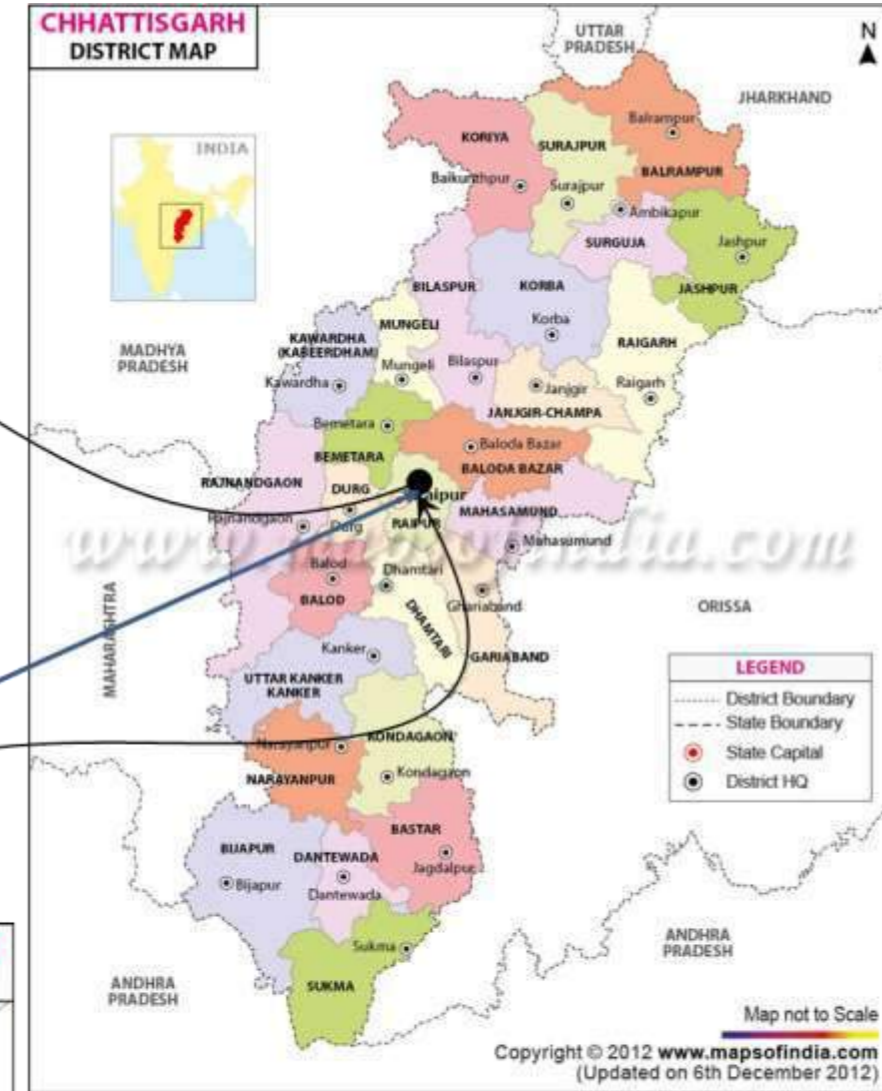
The general location of the project site is shown in fig. 2.1. The topographical map showing the location of the proposed site is shown in fig. 2.2.

Gen. TOR # 4 (v) & Add. TOR # 1

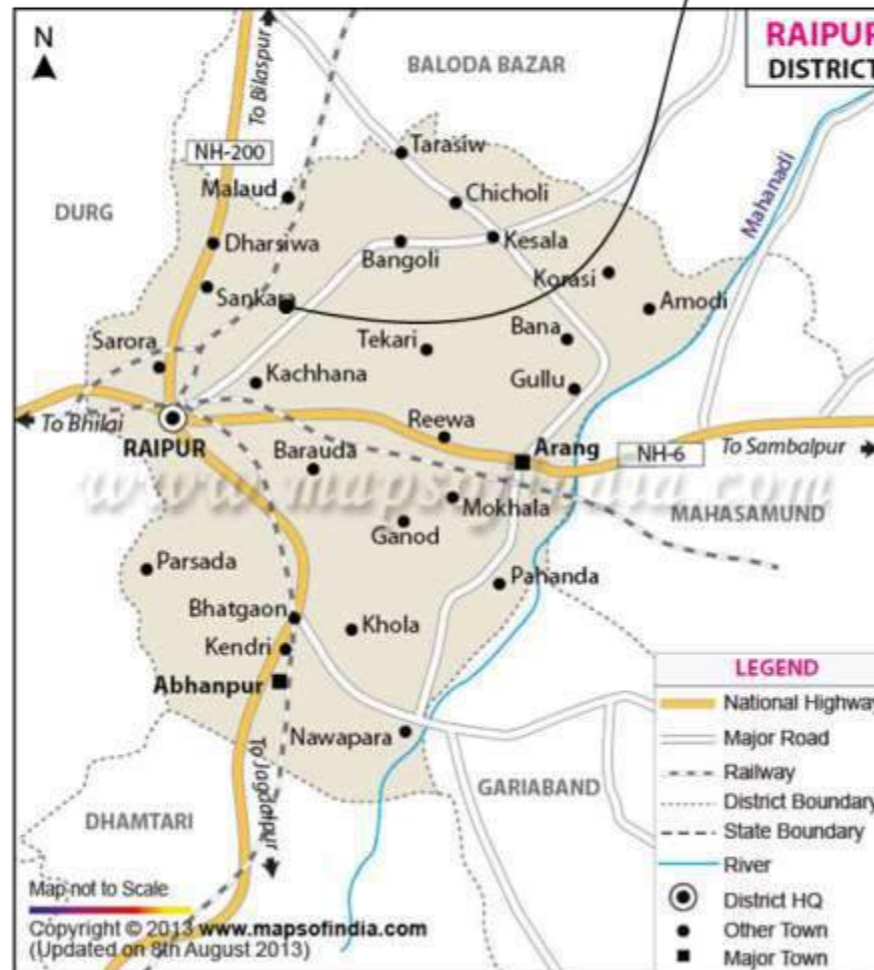


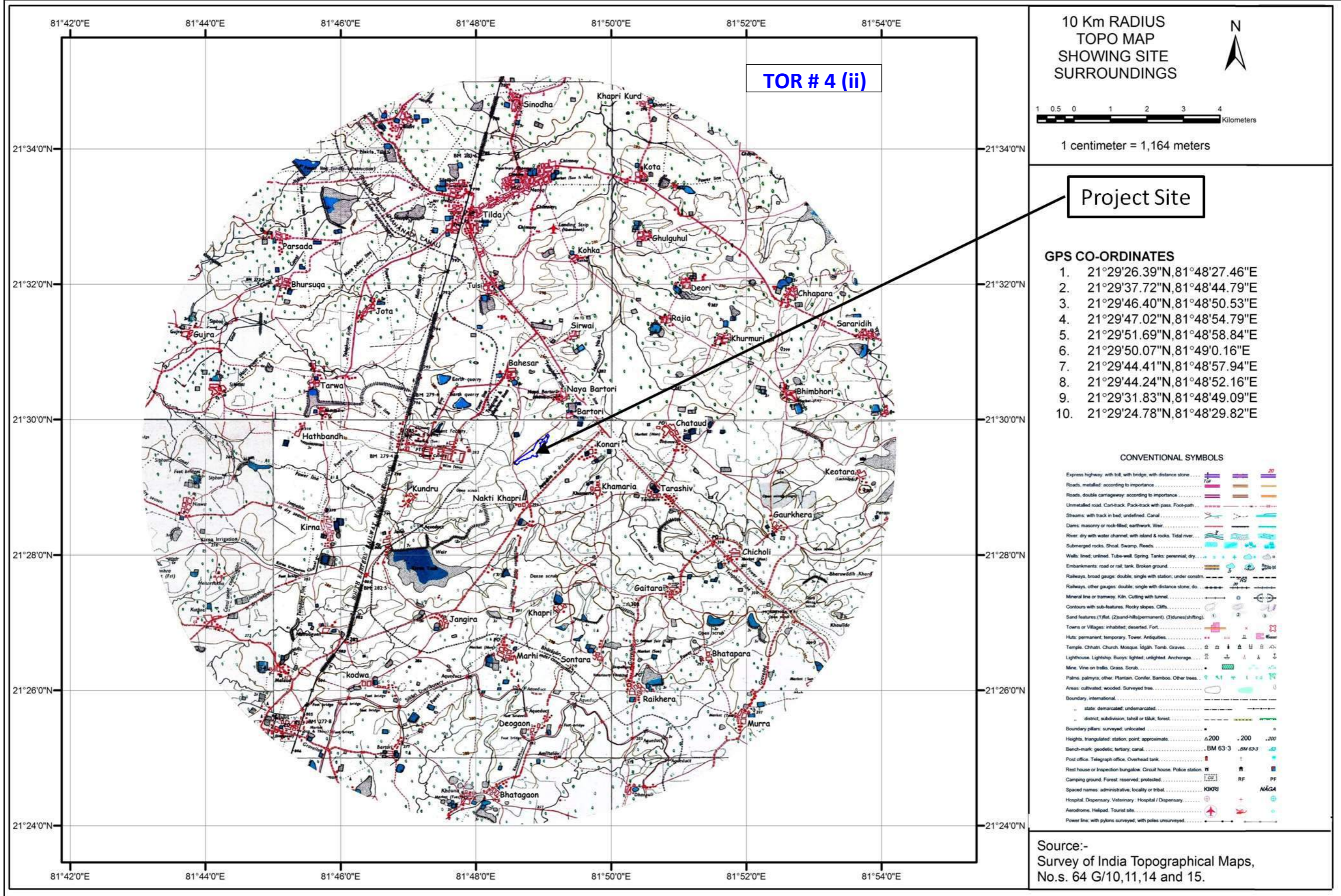
Client : M/s. VIKAS METALIKS & ENERGY LIMITED			
Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh			
DESIGN CONSULTANT:			
		<b>MAA GAYATRI CONSULTANTS PVT LTD</b>	
SIGNATURE	DATE	TITLE:	
DRAWN		<b>PLANT LAYOUT</b>	
DESIGNED			
CHECKED			
APPR			
RELEASED FOR	PRELIMINARY	3	
	TENDER		
	ENGINEERING		
	CONSTRUCTION		
JOB NO.	Scale = 1 CM : 26 M	REV	
DRAWING NUMBER:	MGC/P/PL/01	00	

### General Location Map Showing Project Site



Vikas Metaliks &  
Energy Limited





**2.5 SIZE / MAGNITUDE OF OPERATION [Gen. TOR # 3 (ii)]**

The proposed Integrated Steel Plant envisages manufacturing of the following products:

S.No.	Unit		Product	Plant Configuration	Production Capacity
1.	DRI Kilns		Sponge Iron	4 x 100 TPD	1,20,000 TPA
2.	Induction furnace with CCM & LRF		MS Billets / Ingots	3 x 15 MT	1,35,000 TPA
3.	Rolling Mill		TMT bars / Structural Steels	1 x 300 TPD	90,000 TPA
4.	Power Generation	WHRB	Electricity	4 x 2 MW	8 MW
		FBC Boiler (40 TPH)	Electricity	---	8 MW

**2.6 PROPOSED SCHEDULE FOR APPROVAL AND IMPLEMENTATION [Gen. TOR # 3(i)]**

S.No.	Description	Plant Configuration	Production Capacity	Duration from the Date of receipt of EC & Financial Closure																		
				1st year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year												
1	DRI Kiln based Sponge Iron Plant	2 x 100 TPD	60,000 TPA	■	■	■																
2	DRI Kiln based Sponge Iron Plant	2 x 100 TPD	60,000 TPA				■	■	■													
3	Induction Furnace - Steel Melting Shop	2 x 15 T	90,000 TPA	■	■	■																
4	Induction Furnace - Steel Melting Shop	1 x 15 T	45,000 TPA				■	■	■													
5	Rolling Mill	1 x 300 TPD	90,000 TPA				■	■	■													
6	Power Generation Through WHRB	2 x 2 MW	4 MW	■	■	■																
7	Power Generation Through WHRB	2 x 2 MW	4 MW				■	■	■													
8	Power Generation Through FBC	1 x 40 TPH	8 MW	■	■	■																

## 2.7 PROJECT COST [Gen. TOR # 3(i)]

The project cost envisaged for the proposed project is **Rs. 125 Crores.**

S.No.	Unit / Details	Estimated Cost (Rs. In Crores)
1.	DRI Kilns (4 x 100 TPD - 1,20,000 TPA)	35.80
2.	Induction Furnace with CCM & LRF (3 x 15 MT – 1,35,000 TPA)	15.00
3.	Rolling Mill (1 x 300 TPD – 90,000 TPA)	10.00
4.	Power Generation (4 x 2 MW WHRB based & 1 x 8 MW FBC based)	60.00
5.	For Occupational Health & Risk Assessment	1.00
6.	For Enterprise Social Commitment (ESC) (2.5 % of the Project Cost)	3.20
	<b>Total</b>	<b>125.00</b>

## 2.8 TECHNOLOGY AND PROCESS DESCRIPTION

### 2.8.1 RAW MATERIALS [Gen.TOR # 3 (iv) & Add. TOR # 5]

The following will be the raw material requirement for the proposed project:

Raw Material		Quantity	Sources	Mode of Transport
<b>For DRI Kilns (Sponge Iron)</b>				
Iron ore		1,92,000 TPA	NMDC, Bailadila/ Bachheli	By rail & road (through covered trucks)
Coal	Indian	1,56,000 TPA	SECL, Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)
	Imported	1,11,000 TPA	Indonesia / South Africa / Australia	Through sea route, rail route & by road
Dolomite		6,600 TPA	Raipur	By road (through covered trucks)
Limestone		9,000 TPA	Raipur	By road (through covered trucks)
<b>For Induction Furnace (MS Billets / Ingots)</b>				
Sponge Iron		1,20,000 TPA	In plant generation	By Road (through covered trucks)
Scrap		35,600 TPA	Raipur	By road (through covered trucks)
Ferro Alloys		1,350 TPA	Raipur	By road (through covered trucks)
<b>For Rolling Mill (TMT bars &amp; Structural Steel)</b>				

M.S. Ingots / Steel billets	99,000 TPA	In plant generation	through conveyors
Furnace oil	4950 TPA	HPCL/IOCL depots	Tankers
Coal	24000 TPA	SECL, C.G. / MCL Odisha / Imported	By rail & road (through covered trucks)
Producer gas	8000 Nm <sup>3</sup> /hr	In plant generation	---
<b>For FBC Boiler [Power Generation 8 MW]</b>			
Dolochar	36,000 TPA	In plant generation	through covered conveyors
Coal	Indian	50,400 TPA	SECL C.G. / MCL Odisha
	Imported	35,840 TPA	Indonesia / South Africa / Australia
			By rail & road (through covered trucks)
			Through sea route / rail route / by road

**Note:** All raw materials are in TPA except Furnace Oil, which is in KL/annum

### 2.8.2 RAW MATERIAL TRANSPORT, STORAGE & HANDLING

- Major raw materials will be transported through railway rakes up to the nearest railway station and then to the site through road by covered trucks.
- All the trucks used for the transport of raw materials, products and wastes will be “Environmentally compliant”.
- No. of trucks that will be added to the existing traffic will be 152 trucks /day.
- Internal roads will be made pucca.
- All the raw material required for the proposed steel plant will be stored on pucca platform above ground level.
- All the raw material yards are equipped with water sprinkling system so as to avoid fugitive emission during the material handling.

### 2.8.3 MATERIAL BALANCE [Addl. TOR # 2]

#### (A) SPONGE IRON UNIT [4 x 100 TPD DRI Kilns]

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity (TPA)
1.	Iron Ore	1,92,000	Sponge Iron	1,20,000
2.	Coal (Indian)	1,56,000	Dolochar	36,000
3.	Dolomite	6,600	Flue Gases	1,18,740
4.	Limestone	9,000	Ash / Dust from Bag filters	21,600
5.			Wet Scraper sludge	54,540
6.			Accretion slag	12,720
	<b>Total</b>	<b>3,63,600</b>	<b>Total</b>	<b>3,63,600</b>

**(B) INDUCTION FURNACE (3 x 15 MT)**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity (TPA)
1.	Sponge Iron	1,20,000	MS Billets / Ingots	1,35,000
2.	MS Scrap	35,600	Slag	13,500
3.	Ferro Alloys	1,350	Flue Gases	8,450
	<b>Total</b>	<b>1,56,950</b>	<b>Total</b>	<b>1,56,950</b>

**(C) ROLLING MILL**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity (TPA)
1.	M.S. Ingots / Steel billets	99,000	Rolled Products	90,000
			Mill scales	4,500
			Gases	4,500
	<b>Total</b>	<b>99,000</b>	<b>Total</b>	<b>99,000</b>

**(D) POWER PLANT [8 MW]**

**With 100 % Indian Coal**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity
1.	Coal (Indian)	50,400	Electricity	8 MW
2.			Ash	22,680 TPA
			Gases including dust	27,720 TPA
	<b>Total</b>	<b>50,400</b>	<b>Total</b>	<b>50,400 TPA</b>

Note: Ash in Indian coal is considered Max. of 45%

**With 100 % Imported Coal**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity
1.	Coal (Imported)	35,840	Electricity	8 MW
2.			Ash	5,376 TPA
			Gases	30,464 TPA
	<b>Total</b>	<b>35,840</b>	<b>Total</b>	<b>35,840 TPA</b>

Note: Ash in Imported coal is considered Max. of 15%

**Indian Coal with combination of Dolochar**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity
1.	Coal (Indian)	32,400	Electricity	8 MW
2.	Dolochar	36,000	Ash	36,180 TPA
			Gases including dust	18,280 TPA
	<b>Total</b>	<b>54,460</b>	<b>Total</b>	<b>54,460 TPA</b>

Note: Percentage of Ash in Indian coal is considered as 45% & 60 % in Dolochar

**Imported Coal with combination of Dolochar**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity
3.	Coal (Imported)	23,040	Electricity	8 MW
4.	Dolochar	36,000	Ash	25,056 TPA
			Gases	33,984 TPA
	<b>Total</b>	<b>59,040</b>	<b>Total</b>	<b>59,040 TPA</b>

Note: Ash in Imported coal is considered as 15% & 60 % in Dolochar

**2.8.4 MANUFACTURING PROCESS [Gen. TOR # 3 (viii) & Addl. TOR # 2 & 3]**

**2.8.4.1 DRI PLANT**

The Direct Reduced Iron (DRI) plant will comprise of 4 no. of 100 TPD kiln and related accessories including Waste Heat Recovery power generating unit.

The major plant facilities for the Sponge Iron plant envisaged are as follows:

- Day bins
- Rotary Kiln & Cooler
- Central Control Room
- Product processing and product storage
- Off gas system including waste heat recovery power generation

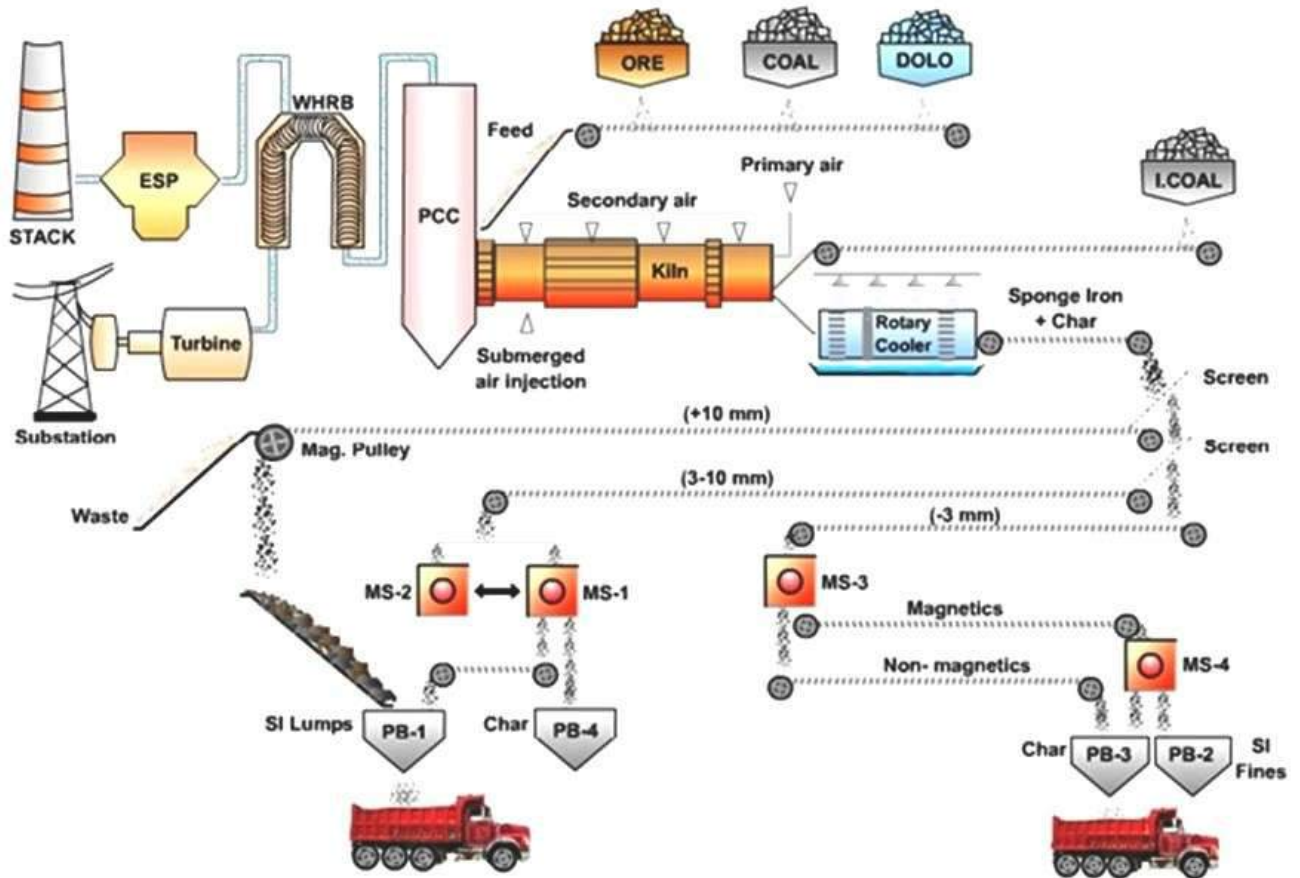
There will be one day bin building for kiln. The day bin building will have bins for meeting raw material required for kiln. This bin will have the storage facility for pellets, feed coal, dolomite etc.

A refractory lined rotary kiln will be used for reduction of Iron ore in solid state. A central Burner located at the discharge end will be used for initial heating of the kiln. Sized Iron ore

will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the Sulphur from the coal. A number of air tubes will be provided along the length of the kiln.

The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion rises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000°C enters the reduction zone. Temperature of the order of 1050°C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron. This hot material will be transferred to rotary cooler. In rotary cooler the material will cool from 1000°C to 100°C in cooler by spraying water. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through magnetic separators and stored in separate bins. Process flow diagram is shown below.

**Process flow diagram – Sponge iron**



**Technological parameters of kiln and cooler**

Description	Parameters
Effective Diameter of Kiln (ID), m	3.4
Length of Kiln, m	60.0
Support, No.	4
Kiln speed, rpm	0.25 – 0.75
Diameter of cooler (ID), m	3.0
Length of cooler, m	30.0
Support, No.	2
Slope %	0.5
Cooler speed, rpm	1.0
Production, tpd	100
Generation of DRI fines (-3 mm), %	20
Working days / years, No.	300
Shifts per day, No.	3

**Quality of Sponge Iron**

Typical quality of DRI would be as:

Degree of metallization, %	90±2
Fe(t), %	87.28
Fe(m), %	78.55
FeO, %	11.22
Al <sub>2</sub> O <sub>3</sub>	4.15
SiO <sub>2</sub>	5.05
MgO	0.41
CaO	0.36
C %	0.20
P %	0.04
S %	0.014

**2.8.4.2 STEEL MELTING SHOP (SMS)**

In Steel Melting Shop (SMS), Sponge Iron will be melted along with melting scrap and fluxes to make pure liquid steel and then to mould it in required size billets. The SMS will consist of following equipment and subassemblies:

**Induction Furnace:** Induction Furnaces is a device to melt the charge material using electrical power. It consists of Crucible lined with water cooled induction coils, Electrical system to give controlled power to induction coil, Hydraulic tilting system, Heat exchanger to cool the circulating water, water softener for generating soft water, furnace transformer, Power Factor improvement system and surge suppressor.

**Ladles:** Ladles are pots with refractory lining inside to withstand 1600<sup>0</sup>C temperature. It has side arms so that can be lifted with the help of crane. Ladles are used to stores the liquid steel from Induction Furnace and take it for further processing. Ladles are with bottom nozzle and pneumatically operated gate for discharge of liquid.

**Cranes:** Electric Over-head (EOT) cranes of various capacities are used to carry the ladles/materials at different places. Cranes are used in Melting hall to charge melting scrap, remove the ladles to the LRF, further to place it over the Tundish of the Continuous Caster, to remove billets from the cooling bed and store at designated places, and also for other petty use. Accordingly, the sizes, capacity and numbers of cranes are decided.

**Continuous Casting Machine (CCM):** CCM is used to continuously cast the liquid steel in required cross section and in length. It consists of Tundish, Mould, Bow with Withdrawal mechanism, straightening mechanism and cooling bed, hydraulic system for withdrawal mechanism, water pumps and cooling towers for water spray on the withdrawn section as well as on the cooling bed. Dummy bar is provided to start the casting. Tundish is a rectangular vessel, lined with refractory and having discharge nozzle with pneumatically operated gate. A stand is erected over it where the ladle is stationed for discharging the liquid in it. Mould is of copper with water cooled jacket. Its cross-section in the bottom is of the size of which billet is to be drawn. Initially the dummy bar of the same size is kept inserted. When the liquid steel is poured in the mould, the dummy bar is drawn slowly, so that the liquid steel in partially frozen state comes out of the mould. Water spray nozzles are installed to spray water over the just drawn billet to cool it further and to harden the skin of the drawn billet.

There will be 3 nos. of Induction Furnaces in the SMS plant, each of 15 MT capacity. MS Ingots/ MS Billets will be produced in Continuous Casting Machine.

**Technological parameters of Induction Furnace**

S.No.	Parameter	Value / Features
1.	Number of furnaces	Three (3)
2.	Number of crucibles per IF	Six (6)(2 Operating +2 Standby)
3.	Furnace capacity	15 tons
4.	Tilting arrangement	Hydraulic
5.	Forward tilt	95 <sup>0</sup>
6.	Metallic charge	80% DRI and 20% scrap
7.	Method of charging	Batch charging by EOT crane
8.	Melting rate	15 tons/hr
9.	Operating frequency	300-500 Hz
10.	No. of transformer taps	To suit furnace operation
11.	Primary voltage	11 kV

**Technological parameters of Continuous Casting machine**

S.No.	Parameters	Units	Value/Features
1.	No. of machine	No.	1 x 2 strand
2.	Type of machine	--	Straight or curved tubular mould and multi point unbending
3.	Base radius	m	6

S.No.	Parameters	Units	Value/Features
4.	Size of cast square billets	mm	100 – 160
5.	Design casting speed for square	m/min	2.8 (min.) – 3.6 (max.)
6.	Casting practice	--	Sequence
7.	No. of heats in sequence		
	For alloys steel product	No.	12
8.	Average heat weight	T	32
9.	Operating days / year	No.	300
10.	Annual production	T	1,35,000
11.	Length of billet	m	6.0 (max.) for square
12.	Tundish capacity	T	5
13.	Billet cutting	--	Automatic Hydraulic Shearing Machine
14.	Steel grades	--	alloy steel

#### 2.8.4.3 ROLLING MILL

A pusher type furnace has been envisaged for the heating of Ingots/Billets. The furnace will be end charging and side discharging. It will have single row as well as double row charging facility. The furnace will be heated with **Producer Gas / FO**. The furnace combustion system will comprise of air blowers, FO storage, supply and preheating system and other associated facilities. The product of combustion will leave the furnace at charging end and exhausted through underground flue tunnel and passed through a metallic tubular recuperator before finally let off to a self-supporting steel chimney of sufficient height. A set of instrument will be used for smooth operation of the furnace.

#### Bar and Round mill

A cross country type mill has been envisaged for the plant. The stands have been grouped into roughing, intermediate and finishing groups. Roughing group will have 4 (four) stands, intermediate group will have 8 (eight) stands and finishing mill will have 8 (eight) stands. Roughing group of stands will be driven by one motor. 4 nos. of intermediate stands will be driven by two motors and balance 4 nos. will be driven by a separate motor. Each stand of finishing group will be driven by single motor. Necessary guides and troughs will be provided at entry and exit of mill stands.

One wire rod outlet has been provided in the mill. The wire rod line will have 4 stand blocks driven by a single motor through gear box. Coil forming and handling of coil is provided. Automated tilting, drop type tilter and feeding arrangement will be provided in roughing group of stands. Repeaters have been provided in roughing / intermediate stands as necessary.

Design provision has been made for introduction of slit rolling facility in future to roll 8 mm, 10 mm & 12 mm rebars in two strands. The rebars discharged from the mill will pass through a water cooling system comprising cooling pipes with high pressure water nozzles for rapid water quenching. At the cooling pipes the bar skin temperature will be reduced to about 600°C. The core of the bar still remains hot. This entrapped heat tempers the bar. This thermo-mechanical treatment of the bars increases tensile strength without adversely effecting weldability and elongation properties. This process eliminates requirement of cold twisting of bars for production of rebars.

A dividing shear, to cut the products to cooling bed length, will be located immediately after the water cooling system. This shear will divide all products to cooling bed lengths. Rake type cooling beds have been envisaged to receive the rolled product. Cooling bed will be provided with incoming and outgoing roller tables. One cold shear has been provided to cut the bars coming out of cooling bed into commercial length of 6 to 12 m. The bar products will be formed into bundles and will be strapped by strapping machine manually.

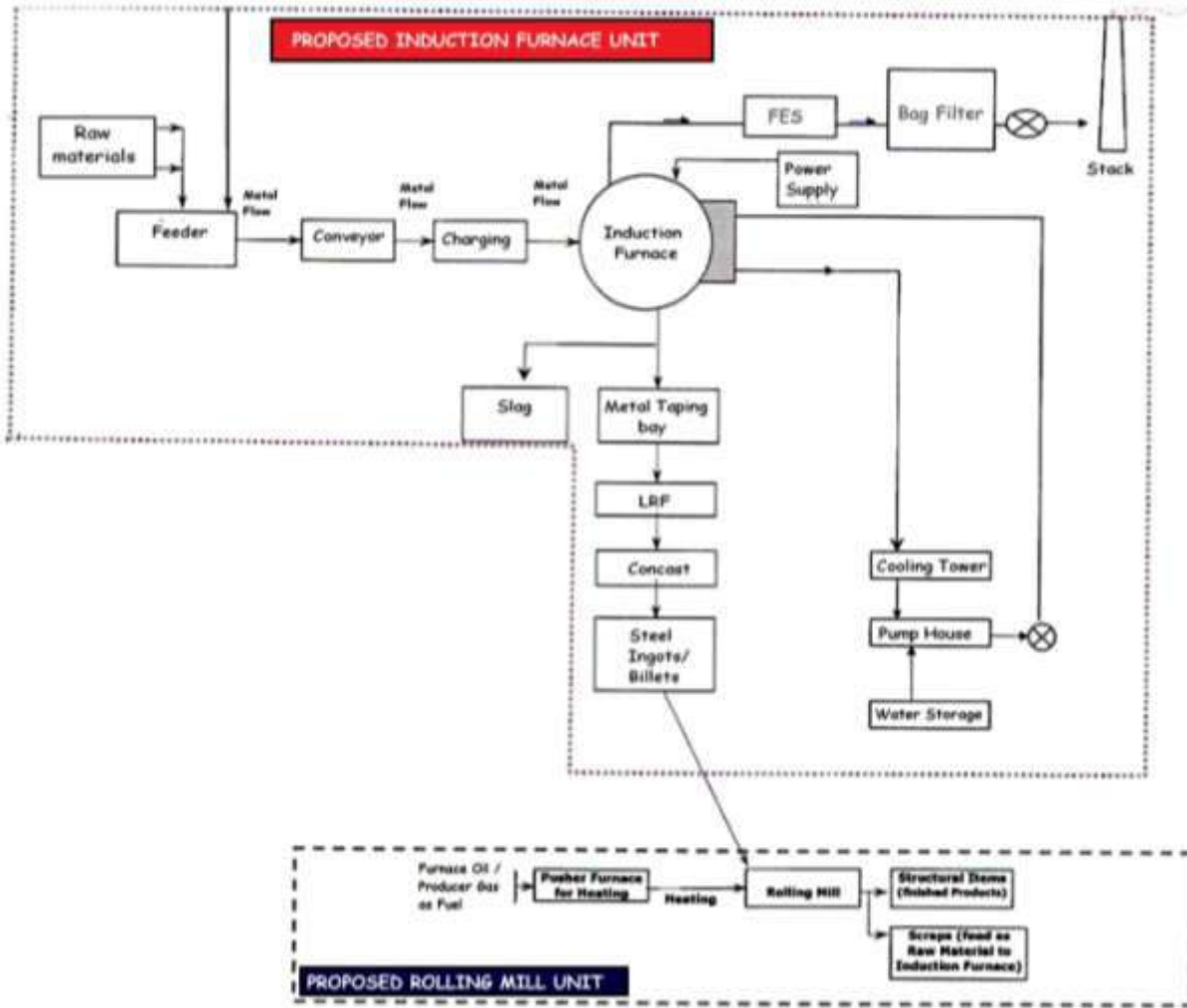
The finished products will be removed by overhead EOT crane and stored in the storage area or dispatched through road vehicles.

**Major Technical Parameters of the Mill**

S.No.	Item	Unit	Parameter
1.	Type of mill	--	Straight mill
2.	Capacity of mill	t/yr	1,50,000
3.	Rolling (operating) speed max	m/s	23 mps
4.	Operating days	d/yr	300
	Shifts /day	No.	3
5.	Hot rolling hours	Hrs./yr	5800
6.	Reheating furnace	--	Pulverized coal, 40 t/d nominal capacity with cold charge, pusher type (Pollution issue?)

S.No.	Item	Unit	Parameter
7.	Feed billet size	Mm	100 – 150, x4000 mm max.
8.	Finished products size range	--	TMT 8mm to 32mm
9.	Billets to product yield	%	96.5

Process flow diagram is shown below.



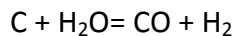
### **PRODUCER GAS (Coal Gasifier)**

It is proposed to install Coal gasifier to produce 8000 Nm<sup>3</sup>/hr of Producer gas. 24000 TPA of coal will be required as fuel in Gasifier.

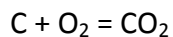
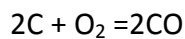
Coal is lifted to the coal storage bin by lifting system; the coal is added in the carbonation stage of two-stage coal gasifier by a programmable control feeding system. Air is blown in the bottom of furnace by air blower, at the same time, low pressure steam goes through the blending bin and blends with air, becomes the gasification agent, which will carry on the gasification reaction with 1200 Celsius degree semi coke in the gasification stage.

Producer gas is made by the gasification agent, which is mixture of steam and air, which goes through red-hot fixed burning bed. The oxygen content in the air and steam react with the carbon in the fuel; generating the producer gas which has ingredients like CO, CO<sub>2</sub>, H<sub>2</sub>, CH<sub>4</sub>, C<sub>2</sub>H<sub>4</sub>, N<sub>2</sub> etc.

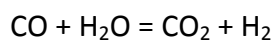
Reaction of steam and carbon is endothermic reaction:



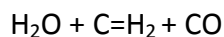
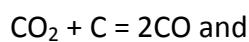
When oxygen and carbon react, and then heat output:



Some steam here reacts with carbon monoxide:



In the reducing zone, quick reaction is occurred when the temperature is below 1200 Celsius degree



When the coal gas goes through the reducing zone, flammable gas content raises rapidly, carbon dioxide and steam content decrease. Across the reducing zone, a part of coal gas is withdrawn through a series of vents in the gasifier walls and is called "DOWN STAGE GAS".

Its temperature is around 300-400 Celsius degree and contains dust and ash particles.

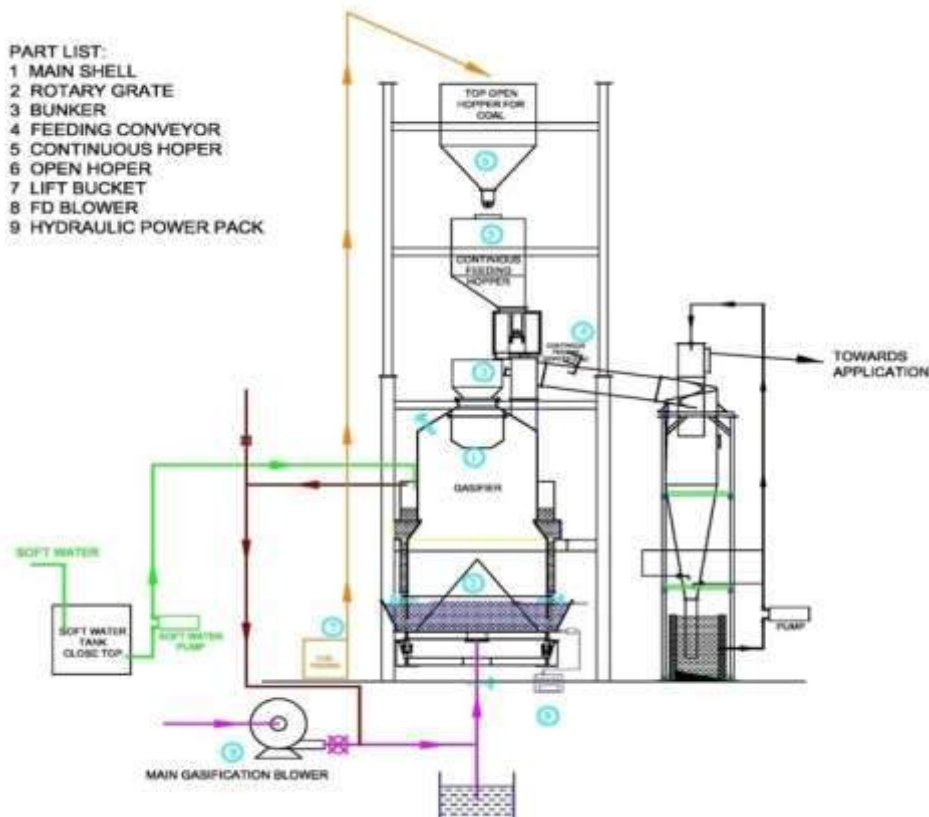
This down stage gas is treated in the cyclone to remove the dust particles, and is then cooled through a heat exchanger. In this heat exchanger the heat is given to the water in the steam drum. The gas is further cooled in a wind cooler, where natural air cools the gas to a lower temperature.

In the carbonation stage, the coal added in the gasifier are dried, preheated and carbonated, generate steam, tar and coal gas, exported from the top of gasifier together, this part of gas is called “up-stage coal gas”, its temperature is around 100-120 Celsius degree.

The temperature of upstage coal gas is about 100-150 Celsius degree, goes into Electric detarrer to remove tar. Water and tar come from the bottom of Electric Detarrer is sent to the tar tank.

The Upstage and downstage coal gas are mixed in the entrance of indirect cooler, the temperature after mixing and cooling in the indirect cooler is 35-40 Celsius degree.

The coal gas pressure adder increases the pressure of the coal gas to the desired value and then connects to the transmitting coal gas pipelines which take the gas to the equipment.



**Chemical Composition of Coal (Approximate)**

S.No.	Parameters	Typical Specification
1.	Gross Calorific Value	4500 to 500 Kcal/Kg
2.	Sulphur	0.4% to 0.5 %
3.	Volatile Matter	10 – 14 %
4.	Ash	10 - 15 %
5.	Moisture	5.0 % max

**Technical Parameters of Producer Gas Plant**

S.No.	Description	Value
1.	Gas production	7800 – 800 Nm <sup>3</sup> /hr
2.	Composition	
	CO <sub>2</sub>	5 – 7%
	O <sub>2</sub>	0.2 – 0.6 %
	CO	23 – 26 %
	H <sub>2</sub>	11 – 13 %
	CH <sub>4</sub>	1 – 1.2 %
	N <sub>2</sub>	Balance
3.	Calorific Value (Net) of final wet gas	1250 to 1375 Kcal/Nm <sup>3</sup>
4.	Pressure of Gas	80 to 90 mm WS
5.	Temperature of Gas	70 <sup>0</sup> C to 75 <sup>0</sup> C
6.	Specific Gravity	0.88 to 0.90

**2.8.4.4 POWER GENERATION (WHRB & FBC)**

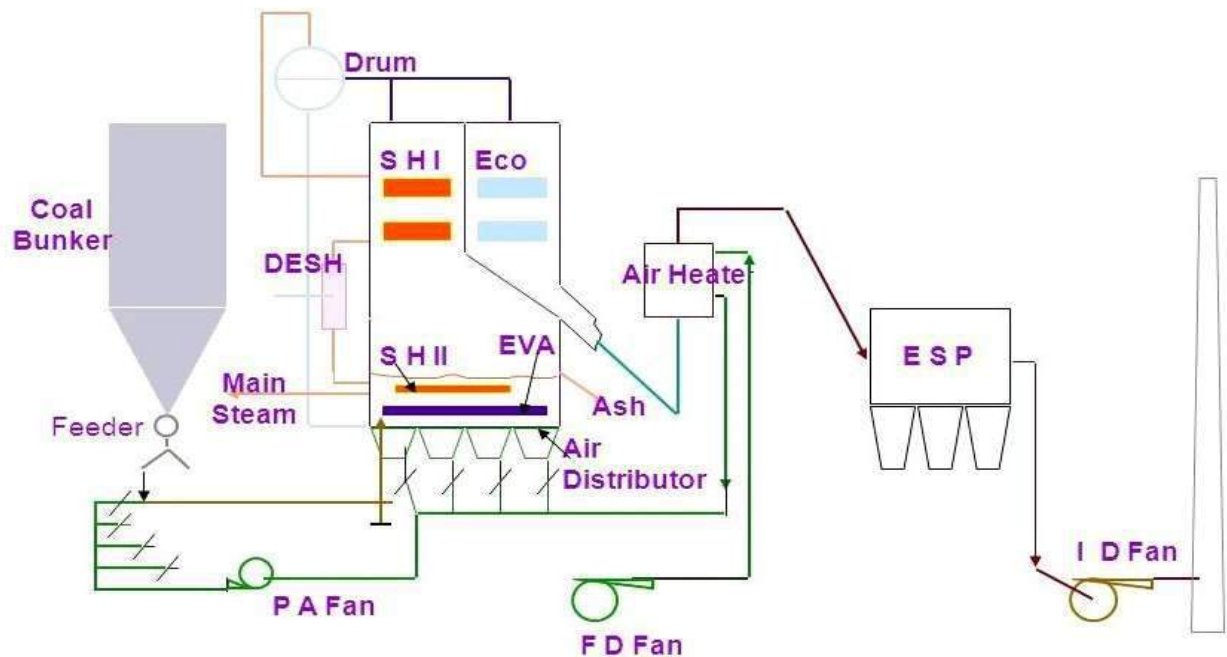
**Waste Heat Recovery Boiler (WHRB)**

Waste Heat Recovery Boiler will be installed to the DRI kiln. **4 x 8 TPH** boilers will be installed. The waste gases from the DRI kilns will pass through WHRB to generate Power. The flue gases after Post Combustion Chamber (PCC) will be taken to unfired furnace chamber and then flow over banks of super heater, convective evaporator and economizer before being discharged to atmosphere through ESP, ID fan and stack. After heat recovery the flue gases will be treated in a high efficiency ESP to bring down the particulate matter in the gases to less than **50 mg/Nm<sup>3</sup>** and discharged through a stack of adequate height. **8 MW** of power will be generated through waste heat recovery.

**Fluidized Bed Combustion (FBC)**

The proposed power plant will have a single Boiler – single Turbine configuration. The boiler will be of Fluidized Bed Combustion boiler with a rating of 40 TPH @ 100 ata and 530°C. Boiler will be provided with all associated accessories like FD / ID / PA Fans, Air Heater, Economizer, Electro Static Precipitator etc. The Steam Turbo Generator will be capable of generating **8 MW** power at 11 KV, 50 Hz and 0.8 pf at Generator terminals.

In the Fluidized Bed Combustion boiler envisaged, combustion of fuel particles is achieved in suspension with an inert aggregate i.e. sand. Combustion air will be fed through air nozzles from underneath into the sand fuel bed. Oil burner will be provided for startup and low load flame stabilization. The fuels proposed in FBC Boiler are **Dolochar & Coal (Indian / Imported)**. The condensate after condenser of STG will be pumped to a common de-aerator by condensate extraction pumps. Feed water from the de-aerator will be pumped to the waste heat recovery boiler as well as FBC boiler by boiler feed pumps. **8 MW** power will be generated through FBC Boiler. The steam generated from both the WHRB and FBC boilers will drive the steam turbine through a common steam header. The flue gases will pass over various heat transfer surfaces to ESP and then finally discharged into chimney by ID fan. The flue gases will be treated in a high efficiency ESP to bring down the particulate matter in the gases to less than **30 mg/Nm<sup>3</sup>** and discharged through a stack of adequate height.



**Process flow diagram – FBC based Power Plant**

## 2.8.5 POWER REQUIREMENT [Gen. TOR # 3 (vii) & Addl. TOR # 6]

Total power requirement for the proposed project = 18.6 MW.

Total captive power generation envisaged = 8 MW (WHRB) + 8 MW (FBC) = 16 MW

Balance 2.6 MW will be sourced from the State Grid.

S.No.	Unit	Power Requirement (in MW)
1	DRI Kiln based Sponge Iron Plant	2.0
2	Induction Furnace based Steel Melting Shop	13.0
3	Rolling Mill	2.0
4	Power Plant	1.6
	<b>Total</b>	<b>18.6</b>

## 2.9 ENVIRONMENTAL MITIGATION MEASURES

### 2.9.1 AIR EMISSION CONTROL [Gen.TOR # 3 (vi) & 7 (v)]

#### *i. Sponge Iron (DRI)*

- Covered trucks will be used for transport of Raw materials.
- Stock piles will be provided with Dust Suppression system.
- Coal screen House, Crusher House, Junction houses and surge hopper, Iron ore screen house and bins, Product discharge, Junction House & SMS bins will be provided with dust extraction system with bagfilters.
- Dust extraction system with Bagfilters will be provided at material transfer points, crusher area, cooler discharge, product separation area, etc. to control dust emission. All the material handling systems will be connected with de dusting system. All the discharge points and feed points wherever the possibility of dust generation is there a de dusting suction point will be provided to collect the dust.
- Water sprinklers will be provided for dust suppression during unloading of raw materials.
- All conveyors will be covered with GI sheets to prevent the fugitive dust.
- Post Combustion Chamber (PCC) will be provided to eliminate the CO emissions.
- Covered shed for storage of Raw materials.
- In the proposed plant the exhaust gases from the rotary kilns will pass through a Waste Heat Recovery Boiler (WHRB) and after heat recovery the gases will pass

through high efficiency Electro Static Precipitator to bring down the particulate matter in the exhaust gases to less than  $50 \text{ mg/Nm}^3$ . Then the treated gases will be let out through **2 no. of combined stacks each of 60 m will be provided to each 2 x 100 TPD DRI Kilns** for effective dispersion of emissions into the atmosphere.

- All internal roads will be asphalted to prevent the fugitive dust due to vehicular transport.

**ii. Steel Melting Shop**

- The Fugitive emissions from the Induction furnaces will be sucked through hoods and will pass through a fume extraction system with bag filters and then the treated gases will be discharged into the atmosphere through **3 no. of stacks** each of **30 m** height for effective dispersion of emissions from Induction Furnaces. The outlet dust emission in the exhaust gases will be less than  **$50 \text{ mg/Nm}^3$** . The dust will be pneumatically carried to covered bins.

**iii. Rolling Mill**

- The flue gases will be discharged into the atmosphere through a stack of **47 m** height for effective dispersion of emissions from Induction Furnaces.
- The emission from Producer gas plant will be treated in Cyclone separator to remove dust particles and Electric detarrer to separate the tar.

**iv. Power Generation**

- Covered trucks will be used for transport of fuel.
- Water sprinklers will be provided at the unloading areas of the fuel for dust suppression. Dust suppression system with plain water - comprising piping network, valves pumps, instrumentation & control, water tank etc. will be provided.
- Coal handling plant & Coal transfer points will be provided with dust extraction system with bagfilters.
- Covered conveyers will be provided with GI sheets to prevent fugitive dust emission.
- The flue gases from the FBC boiler will be treated in a high efficiency Electro Static Precipitator to bring down the particulate emission to less than  **$30 \text{ mg/Nm}^3$** .

- The flue gases will be discharged through a stack of **50 m height** for effective dispersion of SO<sub>2</sub>.
- Internal roads will be asphalted to prevent the fugitive dust emission due to vehicular movement.
- Fly ash will be stored in Silos to prevent fugitive dust emissions.

**v. Internal Roads**

- All internal roads will be asphalted to prevent fugitive emissions due to vehicular movement.

The following pollution control systems are proposed:

S.No.	Source	Control Equipment	Particulate emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP)	< 50 mg/Nm <sup>3</sup>
2.	Induction Furnaces with CCM	Fume Extraction system with bag filters	< 50 mg/Nm <sup>3</sup>
3.	FBC Boiler	Electro Static Precipitator (ESP)	< 30 mg/Nm <sup>3</sup>

**Note :** Apart from the above Fume extraction system with bagfilters, dust suppression system, covered conveyers etc. will also be installed

**2.9.1.1 DUST EXTRACTION AND DUST SUPPRESSION SYSTEM**

The following are the details of dust extraction system & dust suppression system proposed in the plant.

S.No	Location	Pollution control system proposed
1.	<ul style="list-style-type: none"> <li>➤ Coal screen House</li> <li>➤ Crusher House</li> <li>➤ Junction houses and surge hopper</li> <li>➤ Iron ore screen house and bins</li> <li>➤ Product discharge</li> <li>➤ Junction House &amp; SMS bins</li> </ul>	These areas will be provided with Dust extraction systems - each comprising of pulse jet type bag filter, centrifugal fan and motor, duct work including suction hoods, duct supports, stack, dust hopper, rotary air lock valves etc.
2.	Junction houses and truck hoppers	Dust suppression system with plain water - comprising of spray nozzles, piping network, valves, pumps, instrumentation & controls, water tank etc.
3.	Stock piles in DR route	Dust suppression system with plain water - comprising piping network, valves, pumps, instrumentation & control, water tank etc.

**2.9.1.2 SOURCES OF AIR POLLUTION (DRI Kilns)**

S.No	AREA OF AIR POLLUTION	MEASURES ADOPTED FOR CONTROL
1.	Raw Material Handling	<ol style="list-style-type: none"> <li>1. All vibrating screens will be totally covered, to prevent the leakages of dust.</li> <li>2. Throughout the length, the conveyor is covered with G.I. Sheets to prevent the dust pollution</li> <li>3. All the material handling systems will be connected with de dusting system. All the discharge points and feed points wherever the possibility of dust generation is there, a de dusting suction point will be provided to collect the dust.</li> <li>4. <u>DUST SUPPRESSION SYSTEM</u> It is the most effective and successful system to prevent the fly-off of dust. Dust suppression system will be adopted to control the fugitive dust emanated during raw material unloading operations.</li> </ol>
2.	Raw Material Storage System	<ol style="list-style-type: none"> <li>1. All conveyors will be covered with G.I. Sheets to control the dust.</li> <li>2. All bins will be totally packed and covered, so that there will not be any chance of dust leakage. <ol style="list-style-type: none"> <li>i. Weigh feeders will be kept below the hopper and used to feed the known quantity of raw material per hour; it also seals the discharge area.</li> <li>ii. All discharge and feed points wherever the possibility of dust generation is there, will be provided with dust suppression system.</li> <li>iii. All material transfer points will be connected with dust suppression water nozzles to avoid the fugitive dust emission.</li> </ol> </li> </ol>
3.	Kiln Feed System	The raw material will be fed into the kiln through a double pendulum valve, which seals the false air entry into the rotary kiln and gas leakage from the kiln. The chute will be sealed with a double pendulum flap.
4.	Main Processing System Kiln	Sealed system to avoid false air entry as well as exit. So that the desired quality can be produced. Hence no dust escapes outside.
5.	Kiln Cooler Transfer Building	The transfer point between kiln to coolers is completely sealed to avoid the false air entry and gas leakages.
6.	Rotary Cooler	<ol style="list-style-type: none"> <li>1. The water will be circulated again and again. Hence there will not be any water pollution problem</li> <li>2. There will be slip seals at cooler inlet &amp; cooler outlet. The seals are also being lubricated to avoid false air entry and gas leakages.</li> </ol>

S.No	AREA OF AIR POLLUTION	MEASURES ADOPTED FOR CONTROL
		3. Cooler discharge and feed points wherever the possibility of dust generation is there, will be provided with de dusting system.
7.	Waste Gas Cleaning System	<p><b><u>AFTER BURNING CHAMBER (POST COMBUSTION CHAMBER)</u></b>                      The waste gas passes through the after burning chamber where the combustion of carbon monoxide and un burnt carbon takes place in presence of air supplied. The basic purpose of after burning chamber is to reduce the carbon monoxide content in waste flue gases.</p> <p><b><u>ELECTRO STATIC PRECIPITATOR</u></b>                      The flue gas from DRI kilns, after heat recovery, will pass through an electro static precipitator where it is cleaned to contain &lt; 50 mg/Nm<sup>3</sup> particulate matter. The clean gas will be emitted into the atmosphere through the chimney whose height is calculated on the basis of CPCB guidelines. The total conveying of gas from kiln to chimney is done by the induced draft fan located between ESP and chimney.</p>
8.	Product Separation System	<ol style="list-style-type: none"> <li>1. All conveyors will be covered with G.I. Sheets, to control the dust emission.</li> <li>2. All bins will be totally packed and covered, so that there will not be any chance for dust leakage.</li> <li>3. Telescopic chutes will be provided below the hopper to discharge the product directly into the truck for dispatch to avoid the pollution.</li> <li>4. All the above material handling system will be connected with de-dusting system</li> <li>5. All discharge points and feed points wherever the possibility of dust generation is there, a de-dusting suction point will be provided to collect the dust.</li> <li>6. The collected dust will be taken by pneumatic conveying system and stored in a dust storage bin.</li> <li>7. <u>Bag housing system</u>                      In the bag house, the dry dust will be collected in an enclosed housing containing fabric filter bags which are suspended inside the unit. The dust laden air will pass through bag filters forming a dust cake to separate the particulate from the clean air.                      The collected dust will be taken by a pneumatic conveying system and stored in a dust storage bin.</li> </ol>

**2.9.1.3 TECHNICAL SPECIFICATIONS OF CONTROL SYSTEMS**

**TECHNICAL SPECIFICATIONS OF ELECTROSTATIC PRECIPITATOR (ESP)**

**a) For Waste Heat Recovery Boilers (WHRB) - 4 x 100 TPD DRI Kilns**

S.No.	Parameters	Value
1	No. of ESP's	4
2	Gas flow rate per kiln, m <sup>3</sup> /hour	72,000
3	Flue gas temperature (°C)	170
4	Inlet dust concentration, gm/Nm <sup>3</sup>	21
5	Guaranteed outlet dust Concentration, mg/Nm <sup>3</sup>	< 50
6	Design pressure, mm wc	+/- 300
7	Number of fields	Three
8	Pressure drop across the ESP, mm wg	25 (max)
9	Collection efficiency	99.76 %

**b) For FBC Boiler**

S.No.	Parameter	Value
1.	Gas flow rate, m <sup>3</sup> /hr	95,426
2.	Flue gas temperature (°C)	170
3.	Inlet dust concentration, gm/nm <sup>3</sup>	45
4.	Guaranteed outlet dust Concentration, mg/nm <sup>3</sup>	< 30 (at max. flow conditions)
5.	Design pressure, mm wg	300
6.	Number of fields	Three
7.	Pressure drop across the ESP, mm wg	25 (max)
8.	Collection efficiency	99.92 %

**TECHNICAL SPECIFICATIONS OF BAGFILTER (TO INDUCTION FURNACE)**

S.No.	Parameter	Value
1.	Capacity of Bag Filter (m <sup>3</sup> /hr)	42,500
2.	Operating Temperature (°C)	100°C
3.	Size of Each Bag	φ 160 x 4880 mm long
4.	No. of Modules	1 No.
5.	Total No. of Bags	150 Nos.
6.	Total filtering Area (m <sup>2</sup> )	342
7.	Air To Cloth Ratio	1.4
8.	Pressure drop (mm WG.)	125 to 150
9.	Bag Material	500 gm/m <sup>2</sup>

S.No.	Parameter	Value
		Non-woven polyester needle felt
10.	Compressed air reqd. at 7 kg/cm <sup>2</sup>	338 ( FAD AT 6 Kg / cm <sup>2</sup> )
11.	No. of Solenoid Cum Diaphragm Pulse Valves 40 NB (1½") x 24 v D.C.	12 Nos.
12.	Type & Qty of Sequential Timer	12 Channel Electronic Sequential Controller -240 volt A.C. Supply
13.	Dust Disposal Arrangement	Through Rotary Air Lock Valves
14.	Rated Speed	20 RPM
15.	Type of Drive	Direct Drive Through Flexible Coupling
16.	Geared Motor Rating	0.37 KW / 20 rpm
17.	Material of Construction:	
a)	Raw Gas Casing	3.15 mm thk. MS sheet
b)	Clean Gas Casing	3.15 mm thk. MS sheet
c)	Hopper	3.15 mm thk. MS sheet
d)	Cage Plate	4 mm thk. MS sheet
e)	Diffuser at inlet	To be Provided
f)	Cage	MS
g)	Venturies	MS
18.	Guaranteed Emission Level	Less than 50 mg / Nm <sup>3</sup>

## **ACTION PLAN FOR CONTROL AND MONITORING OF FUGITIVE EMISSIONS**

### **[Gen. TOR # 7 (vi)]**

#### **CONTROL OF FUGITIVE EMISSIONS FROM SPONGE IRON PLANT**

Fugitive dust emissions are likely in the unloading areas, material transfer point, cooler discharge area, product separation area, etc. Fugitive emission in the material unloading area can be avoided by providing dust suppression system. Fugitive emission from material unloading operations, material transfer points will be controlled fully with total enclosure and all the transfer emission will be connected with extractor inlet point and will pass through a high efficiency Bag Filter before discharging into the atmosphere. All internal roads will be asphalted.

#### **MONITORING OF SECONDARY FUGITIVE EMISSIONS**

##### **Sponge Iron plant**

As per MoEF notification vide no. G.S.R. 414 (E) dated 30<sup>th</sup> May 2008, fugitive emissions will be monitored at a distance 10 m from their source as per following:

S.No	Area	Monitoring Location
1.	Raw material handling area	Screen area, Transfer Points, Stock Bin area
2.	Crusher area	Crushing plant, vibrating screen, transfer points
3.	Raw material feed area	Feeder area, Mixing area, transfer points
4.	Cooler discharge area	Over size discharge area, Transfer Points
5.	Product processing area	Intermediate stock bin area. Screening plant, Magnetic Separation unit, Transfer Points, Over size discharge area, Product separation area, Bagging area
6.	Other areas	Areas as specified by State Pollution Control Board

The fugitive emissions will be maintained below the MoEF&CC norm of 2000 µg/m<sup>3</sup>.

### 2.9.2 WASTEWATER MANAGEMENT **[Gen.TOR # 3 (vi) & 7 (iv)]**

- There will be no effluent discharge from the DRI plant, SMS & Rolling Mill as closed-circuit cooling system will be adopted.
- Air Cooled condensers will be provided in the power plant, which will be reduce the water consumption significantly. Hence wastewater generation will also be minimized.
- Effluent from power plant will be treated in ETP and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench.

#### **EFFLUENT TREATMENT PLANT**

pH of the boiler blowdown will be between 9.5 to 10.5. Hence a neutralization tank will be constructed for neutralizing the boiler blow down. DM plant regeneration water will be neutralized in a neutralization tank. After neutralization, these two effluent streams will be mixed with Cooling Tower blowdown in a Central Monitoring Basin (CMB). Service water will be treated in an oil separator and after treatment it will be taken to CMB. The treated effluent will be utilized for dust suppression, ash conditioning and for Green belt development. No effluent will be let out of the plant premises. Hence Zero discharge concept will be implemented. Sanitary waste water will be treated in Septic tank followed by sub-surface dispersion trench.

The following will be treated combined effluent characteristics.

- pH - 6.5 - 8.5
- TSS - < 100 mg/l
- Oil & Grease - < 10 mg/l
- Free available chlorine - < 1.0 mg/l
- Copper - < 1.0 mg/l
- Iron - < 1.0 mg/l
- Zinc - < 1.0 mg/l
- Chromium - < 0.2 mg/l
- Phosphates - < 5.0 mg/l

### **TREATED EFFLUENT DISPOSAL**

<b>Total effluent generation from project</b>	<b>:</b>	<b>76 m<sup>3</sup>/day</b>
(Excluding sanitary waste)		
Effluent quantity to be used for ash conditioning	:	30 m <sup>3</sup> /day
Effluent to be used for dust suppression in CHP	:	10 m <sup>3</sup> /day
Balance effluent to be used for Greenbelt development	:	36 m <sup>3</sup> /day

11.3 Acres of greenbelt will be developed within the plant premises by using the treated effluent. A dedicated pipe distribution network will be provided for using the treated effluent for greenbelt development.

The characteristics of the treated effluent will comply with the SPCB Standards for onland irrigation. Hence there will not be any adverse impact on ground water / surface water due to the proposed project.

### **2.9.3 NOISE LEVEL MANAGEMENT**

- The major noise generating sources in the plant will be STG, boiler, feed pumps, steam blowing from boiler, D.G. Sets.
- Acoustic enclosures will be provided to STG & D.G. set.
- Quench water Silencer will be provided to prevent the noise during steam blowing.
- All machinery will be manufactured as per MoEF/OSHA & other international standards on noise levels.
- The noise levels will be confined to the working zones of the plant.

- Ear plugs will be provided to all employees who will enter into the noise prone areas.
- Community noise levels are not likely to be affected due to the proposed thick green belt and attenuation due to the physical barriers.
- The ambient noise levels will be in accordance with MoEF&CC norms i.e. ambient noise levels will be < 75 dBA during daytime and < 70 dBA during night time.

#### 2.9.4 SOLID WASTE MANAGEMENT

### [Gen. TOR # 7 (vii) & Add. TOR # 4]

The following will be the solid waste generation & proposed method of disposal.

S.No	Waste / By product	Quantity (TPA)	Method of disposal
1	Ash from DRI	21,600	Will be given to M/s. Ultratech Cement Ltd. (Rawan Cement works)
2	DoloChar	36,000	Will be utilized in FBC boiler as fuel
3	Wet scrapper sludge	54,540	Will be given to brick manufacturers.
4	Kiln Accretion Slag	12,720	Will be used in road construction
5	Slag from SMS	13,500	Slag will be crushed and after recovery of iron, it will be used for road construction/given to brick manufacturers..
6	Mill Scale from Rolling Mill	4,500	Will be reused in SMS
7	Ash from Power Plant (with Indian coal)	22,680	Will be given to Cement Plant
8	Ash from Power Plant (with Imported coal)	5,376	Will be given to Cement Plant
9	Ash from Power Plant (with Indian coal + Dolochar)	36,180	Will be given to Cement Plant
10	Ash from Power Plant (with Imported coal + Dolochar)	25,056	Will be given to Cement Plant
11	Tar (from Producer gas plant)	576	Will be given to Coal tar distillation units
12	Ash (from Producer gas plant)	3600	Will be given to Cement plant

Letter for Expression of Interest for utilization of flyash by Cement plant is enclosed as Annexure- 6.

Note: [Add. TOR # 7]

Solid wastes such as dolochar, accretion slag, granulated slag will be stored in designated storage yard. Ash generated will be stored in silos only. There will not be any open storage of fly ash.

However upon commencement of production, TCLP will be conducted and disposal of slag will be in accordance with the MOEF&CC/CPCB/CECB norms. Composition of SMS Slag & Mill Scales are given below.

**Typical slag composition (mg/kg)**

Sl. No.	Element	SMS Slag
1	Al	1.6
2	Cr (III)	760
3	Mo	26
4	Pb	24
5	Cd	< 0.3
6	Ni	83
7	Co	14
8	V	634
9	Be	2.6
10	Ba	30
11	Sr	147
12	Sn	< 3.3
13	Sb	144

**Hazardous waste generation, storage & disposal [Gen. TOR # 3 (vi)]**

**1. Waste oil: 0.5 KL / Annum**

This will be stored in covered HDPE drums in a designated area and will be given to SPCB approved vendors.

**2. Used Batteries**

Used batteries will be given back to the supplier under buy back agreement with supplier.

**MUNICIPAL SOLID WASTE GENERATION & ITS DISPOSAL**

Type of Municipal solid waste	Proposed method of disposal
Construction debris (generated during construction phase)	Used for landfill within the plant site to the extent possible and recyclables will be given to authorised recyclers.
Canteen waste	Used in composting / Vermiculture Used as manure for greenbelt development within the premises.
Recyclables	Given to SPCB authorised dealers

### **2.9.5 GREEN BELT**

- 11.3 Acres of Greenbelt will be developed within the plant premises.
- 5 to 45 m wide greenbelt will be developed all around the plant.
- Local DFO will be consulted in developing the green belt.
- The tree species to be selected for the plantation are pollutant tolerant, fast growing, wind firm, deep rooted. A three-tier plantation is proposed comprising of an outer most belt of taller trees which will act as barrier, middle core acting as air cleaner and the innermost core which may be termed as absorptive layer consisting of trees which are known to be particularly tolerant to pollutants.
- Greenbelt will be developed as per CPCB guidelines.
- 600 plants will be planted per acre as per CPCB norms.

### **2.10 ASSESSMENT OF NEW & UNTESTED TECHNOLOGY FOR THE RISK OF TECHNOLOGICAL FAILURE**

Manufacturing technologies for all the units proposed in the project are well proven technologies all over the world. Hence there will not be any risk of technological failures from this plant.

# CHAPTER – 3

## DESCRIPTION OF ENVIRONMENT (BASELINE ENVIRONMENTAL STATUS)



### 3.1 BASELINE ENVIRONMENTAL STATUS

This chapter gives an idea and description of environmental status of the study area with reference to the prominent environmental attributes. The main objective of describing the environment is to assess present environmental quality & the environmental impacts. The study area 10 Km. radius of the Project site is covered in Survey of India **Toposheet Nos. 64 G/10, 11, 14 & 15.**

The impact identification always commences with the collection of baseline data such as ambient air quality, ground water quality, surface water quality, noise levels, land environment, land use pattern, flora & fauna and socio economic aspects with in the study zone of 10 Km. radius during **March 2017 to May 2017.**

Baseline data has been collected pertaining to Ambient Air, Noise, Water & Soil by an external laboratory M/s. Universal Enviro Associates (UEA), which is a MoEFCC recognized laboratory. Due care has been taken by PIONEER ENVIRO to ensure that calibrated samplers / equipments/ instruments have been utilized for sampling & analysis. Adequate care has also been taken to ensure proper Preservation & Transportation methods in accordance with the standard procedures. It is ensured by PIONEER ENVIRO that Standard Operating Procedures have been followed by M/s. Universal Enviro Associates (UEA).

### 3.2 AIR ENVIRONMENT

#### 3.2.1 METEOROLOGY

Meteorology of the study area plays an important role in the air pollution studies. The prevailing micro meteorological conditions at the site will regulate the dispersion and dilution of air pollutants in the atmosphere. The predominant wind directions and the wind speed will decide the direction and distance of the most affected zone from the proposed activity. The meteorological data collected during the monitoring period is very useful in

interpretation of baseline as input for dispersion models for predicting the Ground Level Concentrations (GLC).

### **3.2.2 METEOROLOGICAL DATA RECORDED AT PROJECT SITE [Gen. TOR # 6 (i)]**

A Temporary Weather Monitoring Station was installed at the project site and temperature, relative humidity, wind direction, wind speed, rainfall, etc. were recorded for one season **March 2017 to May 2017.**

#### **Cloud cover**

During the study period, it was observed that no clouds have seen & sky is very clear. During the monsoon season both in the mornings & evenings the skies were found to be cloudy.

#### **Rainfall**

There is no rainfall recorded during the study period. However annual rainfall of the Raipur district is 1323 mm.

#### **Temperature**

The maximum temperature recorded was 47<sup>0</sup>C and the minimum temperature was 16<sup>0</sup>C at the Plant.

#### **Relative Humidity**

The relative humidity's he site at are ranging from 28% to 55%.

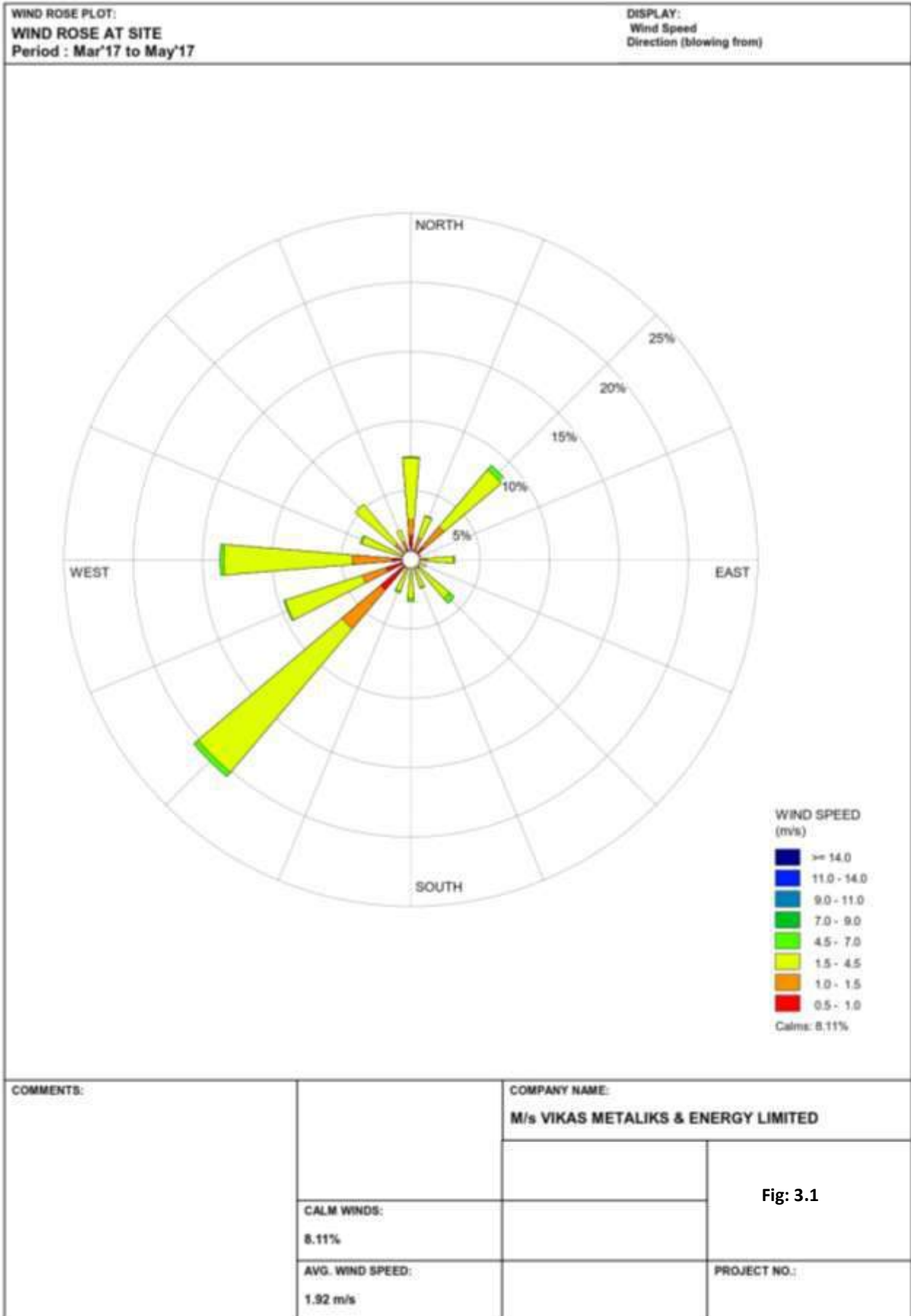
#### **Wind Pattern at Project Site during the study period**

Wind rose from IMD has been collected for **Raipur, Chhattigarh** (Nearest IMD station)

Weather monitoring station has been established at site to collect Meteorological data.

Wind speed and direction are recorded at site every hour.

The wind rose shows that winds are predominantly blowing from **SW to NE direction**. The wind rose diagram of summer season is shown in fig 3.1.



**24 Hourly Site Specific Micro-meteorological Data**

S.No.	Time	Wind Direction	Wind Speed (m/s)	Ambient Temp. (Kelvin)	Stability Class	Mixing Height (m)
1	1:00:00	CALM	0	296.2	6	400
2	2:00:00	SW	1.6	295.1	5	400
3	3:00:00	W	1.2	294.0	4	300
4	4:00:00	N	1.1	294.2	5	400
5	5:00:00	SW	1.9	298.5	6	300
6	6:00:00	NE	1.5	300.2	3	600
7	7:00:00	SWW	1.9	303.7	2	1000
8	8:00:00	SW	2.2	305.6	3	1100
9	9:00:00	NW	1.2	307.9	2	1200
10	10:00:00	SW	2.2	310.1	2	1300
11	11:00:00	W	2.5	312.1	1	1200
12	12:00:00	S	3.3	313.5	2	1000
13	13:00:00	SE	3.4	314.2	1	1200
14	14:00:00	SW	1.8	312.5	1	1400
15	15:00:00	NE	4.8	310.7	2	1200
16	16:00:00	W	2.8	308.3	1	1400
17	17:00:00	NE	2.5	307.5	3	900
18	18:00:00	SW	3.5	306.7	3	800
19	19:00:00	E	2.6	305.1	4	600
20	20:00:00	NWW	1.8	303.6	4	500
21	21:00:00	SW	1.9	301.9	3	900
22	22:00:00	NNE	1.1	300.8	4	500
23	23:00:00	CALM	0	299.0	6	400
24	0:00:00	CALM	0	297.1	6	500

### **3.2.3 AIR QUALITY [Gen. TOR # 6 (ii)]**

The ambient air quality with respect to the study zone of 10 km. radius around the project site forms the baseline information. The study area represents mostly rural environment. The various sources of air pollution in the region are vehicular traffic, dust arising from unpaved village roads & domestic fuel burning. The Prime objective of baseline air quality survey is to assess the existing air quality of the area. This will also be useful in assessing the conformity to standards of the ambient air quality during the operation of the proposed project.

#### **3.2.3.1 SELECTION OF SAMPLING STATIONS**

The base line status of the ambient air quality can be assessed through scientifically designed Ambient Air Quality Monitoring Network.

The selection of sampling locations in the air quality surveillance programme is based on the following:

- (a) Representation of the Existing Plant.
- (b) Representation of down wind direction.
- (c) Representation of upwind direction.
- (d) Representation of cross wind direction.
- (e) Representation of residential areas.
- (f) Representation of sensitive receptors.

8 nos. of Ambient Air Quality Monitoring Stations were established within the study zone of the plant area in accordance with CPCB guidelines.

The sampling locations and their distances are shown in Table 3.1.2 and in Fig 3.2. The Max., Min., and 98<sup>th</sup> percentile values for all the sampling locations for PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub> are shown in Table 3.1.2 to 3.1.11.

#### **3.2.3.2 PARAMETERS MONITORED**

Ambient air quality was monitored for 2 days in a week for three months (March 2017 to May 2017) to assess the existing status of air pollution and pollution dispersion pattern over the whole air basin of plant as per the National Ambient Air Quality Standards vide No. S. No. 826 (E) dated 16<sup>th</sup> November, 2009. At each Monitoring Particulate Matter (PM<sub>2.5</sub>), Particulate Matter (PM<sub>10</sub>), SO<sub>2</sub> & NO<sub>x</sub> are monitored.

### 3.2.3.3 SAMPLING & ANALYTICAL TECHNIQUES INSTRUMENTS USED FOR SAMPLING

Envirotech RDS , APM 550 dust samplers pertaining to M/s. Universal Enviro Associates (UEA) have been used for monitoring PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub>, PM<sub>2.5</sub> & PM<sub>10</sub> are estimated by gravimetric method West & Gaeke method (IS –5182, part III 1969) has been adopted for estimation of SO<sub>2</sub>, Jacob – Hochheiser method (IS –5182, part IV, 1975) has been adopted for estimation of NO<sub>x</sub>. The standard operating Procedures of M/s. Universal Enviro Associates have been used for sampling and analysis.

#### Calibration

Calibration charts have been prepared for all gaseous pollutants. The Calibration is carried out when new absorbing solutions are prepared.

**TABLE 3.1.2**

#### TECHNIQUES USED FOR AMBIENT AIR QUALITY MONITORING

S.No	Parameter	Technique	Minimum Detectable Limit ( $\mu\text{g}/\text{m}^3$ )
1.	Particulate Matter (PM <sub>2.5</sub> )	APM 550 dust sampler (Gravimetric Method)	5.0
2.	Particulate Matter (PM <sub>10</sub> )	Respirable Dust Sampler (Gravimetric Method)	5.0
3.	SO <sub>2</sub>	EPA Modified West & Gaeke method	4.0
4.	NO <sub>x</sub>	Arsenite modified Jacob & Hochheiser	4.5
5.	CO	Adsorption and Desorption followed by GC analysis	12.5

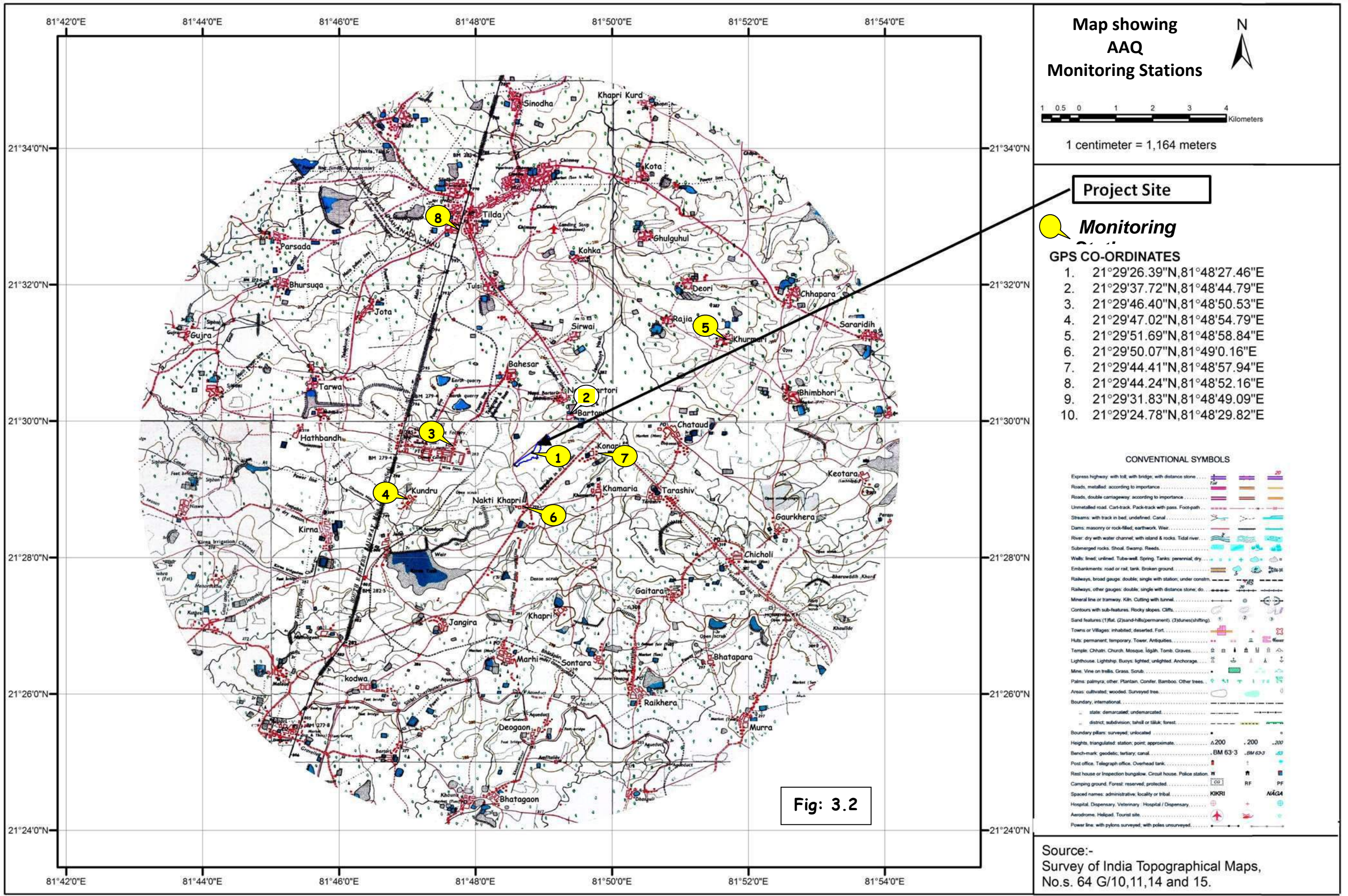
**TABLE 3.1.3**

#### AMBIENT AIR QUALITY MONITORING STATIONS

S.No	STATION	DIRECTION	DISTANCE w.r.t site (in Kms.)	CRITERIA FOR SELECTION
1.	Project Site	---	---	Represents Project site
2.	Bartori	NNE	0.4	Represents nearest Down wind direction
3.	Near Century Cement Plant	W	1.6	Represents Industrial Activity
4.	Kundru	SW	2.5	Represents nearest Upwind direction
5.	Khurmuri	NE	4.7	Represents Down wind direction
6.	Nakti khapri	S	1.2	Represents Cross wind direction & near crusher activity
7.	Konari	E	1.0	Represents Residential Area
8.	Tilda	NNW	6.0	Represents Cross wind direction & Densely populated area.

**Vikas Metaliks & Energy Limited  
Integrated Steel Plant**

Bartori Village, Tilda Tehsil,  
Raipur District, Chhattisgarh



**Map showing  
AAQ  
Monitoring Stations**

1 0.5 0 1 2 3 4  
Kilometers

1 centimeter = 1,164 meters

- Project Site**
- Monitoring**
- GPS CO-ORDINATES**
1. 21°29'26.39"N, 81°48'27.46"E
  2. 21°29'37.72"N, 81°48'44.79"E
  3. 21°29'46.40"N, 81°48'50.53"E
  4. 21°29'47.02"N, 81°48'54.79"E
  5. 21°29'51.69"N, 81°48'58.84"E
  6. 21°29'50.07"N, 81°49'0.16"E
  7. 21°29'44.41"N, 81°48'57.94"E
  8. 21°29'44.24"N, 81°48'52.16"E
  9. 21°29'31.83"N, 81°48'49.09"E
  10. 21°29'24.78"N, 81°48'29.82"E

**CONVENTIONAL SYMBOLS**

Express highway: with toll, with bridge, with distance stone		
Roads, metalled: according to importance		
Roads, double carriageway: according to importance		
Unmetalled road: Cart-track, Pack-track with pass, Foot-path		
Streams: with track in bed, undefined, Canal		
Dams: masonry or rock-filled, earthwork, Weir		
River: dry with water channel, with island & rocks, Tidal river		
Submerged rocks, Shoal, Swamp, Reeds		
Wells: lined, unlined, Tube-well, Spring, Tanks perennial, dry		
Embankments: road or rail, tank, Broken ground		
Railways, broad gauge: double, single with station, under constn.		
Railways, other gauges: double, single with distance stone, do.		
Mineral line or tramway, Kin. Cutting with tunnel		
Contours with sub-features, Rocky slopes, Cliffs		
Sand features: (1) flat, (2) sand-hills(permanent), (3) dunes(shifting)		
Towns or Villages: inhabited, deserted, Fort.		
Huts: permanent, temporary, Tower, Antiquities		
Temple: Chhatr, Church, Mosque, Idgah, Tomb, Graves		
Lighthouse, Lightship, Buoys: lighted, unlighted, Anchorage		
Mine, Vine on trails, Grass, Scrub		
Palms: palmyra, other, Plantain, Conifer, Bamboo, Other trees		
Areas: cultivated, wooded, Surveyed tree		
Boundary, international		
state: demarcated, undemarcated		
district, subdivision, tahsil or taluk, forest		
Boundary pillars: surveyed, unlocated		
Heights, triangulated: station, point, approximate		
Bench-mark: geodetic, tertiary, canal		
Post office, Telegraph office, Overhead tank		
Rest house or inspection bungalow, Circuit house, Police station		
Camping ground, Forest: reserved, protected		
Spaced names: administrative, locality or tribal		
Hospital, Dispensary, Veterinary Hospital / Dispensary		
Aerodrome, Helipad, Tourist site		
Power line: with pylons surveyed, with poles unsurveyed		

**Fig: 3.2**

Source:-  
Survey of India Topographical Maps,  
No.s. 64 G/10,11,14 and 15.

**TABLE 3.1.4**

Sampling Location: Project Site Unit : $\mu\text{g}/\text{m}^3$			Sampling Period: Mar.2017 to May.2017	
Parameter	Maximum	Minimum	98 <sup>th</sup> percentile	Standard as per NAAQS
PM <sub>2.5</sub>	24.3	20.4	24.3	60
PM <sub>10</sub>	40.5	34.2	40.4	100
SO <sub>2</sub>	8.8	7.2	8.8	80
NO <sub>x</sub>	8.5	7.0	8.4	80
CO	425	365	419	2000

**TABLE 3.1.5**

Sampling Location: Bartori Unit : $\mu\text{g}/\text{m}^3$			Sampling Period: Mar.2017 to May.2017	
Parameter	Maximum	Minimum	98 <sup>th</sup> percentile	Standard as per NAAQS
PM <sub>2.5</sub>	25.6	21.2	25.2	60
PM <sub>10</sub>	42.7	35.1	42.5	100
SO <sub>2</sub>	9.2	7.6	9.1	80
NO <sub>x</sub>	9.0	8.0	9	80
CO	450	390	448	2000

**TABLE 3.1.6**

Sampling Location: Near Century Cement Plant Unit : $\mu\text{g}/\text{m}^3$			Sampling Period: Mar.2017 to May.2017	
Parameter	Maximum	Minimum	98 <sup>th</sup> percentile	Standard as per NAAQS
PM <sub>2.5</sub>	30.7	25.5	30.7	60
PM <sub>10</sub>	51.2	42.4	50.9	100
SO <sub>2</sub>	9.5	7.8	9.4	80
NO <sub>x</sub>	9.8	8.2	9.7	80
CO	480	440	480	2000

**TABLE 3.1.7**

Sampling Location: Kundru Unit : $\mu\text{g}/\text{m}^3$			Sampling Period: Mar.2017 to May.2017	
Parameter	Maximum	Minimum	98 <sup>th</sup> percentile	Standard as per NAAQS
PM <sub>2.5</sub>	24.1	20.7	23.8	60
PM <sub>10</sub>	42.3	34.8	42.1	100
SO <sub>2</sub>	9.4	8.5	9.3	80
NO <sub>x</sub>	8.8	8.0	8.8	80
CO	440	395	436	2000

**TABLE 3.1.8**

Sampling Location: Khurmuri Unit : $\mu\text{g}/\text{m}^3$			Sampling Period: Mar.2017 to May.2017	
Parameter	Maximum	Minimum	98 <sup>th</sup> percentile	Standard as per NAAQS
PM <sub>2.5</sub>	24.5	19.6	24.1	60
PM <sub>10</sub>	40.7	33.2	40.3	100
SO <sub>2</sub>	8.6	7.4	8.6	80
NO <sub>x</sub>	10.0	7.0	9.9	80
CO	482	425	479	2000

**TABLE 3.1.9**

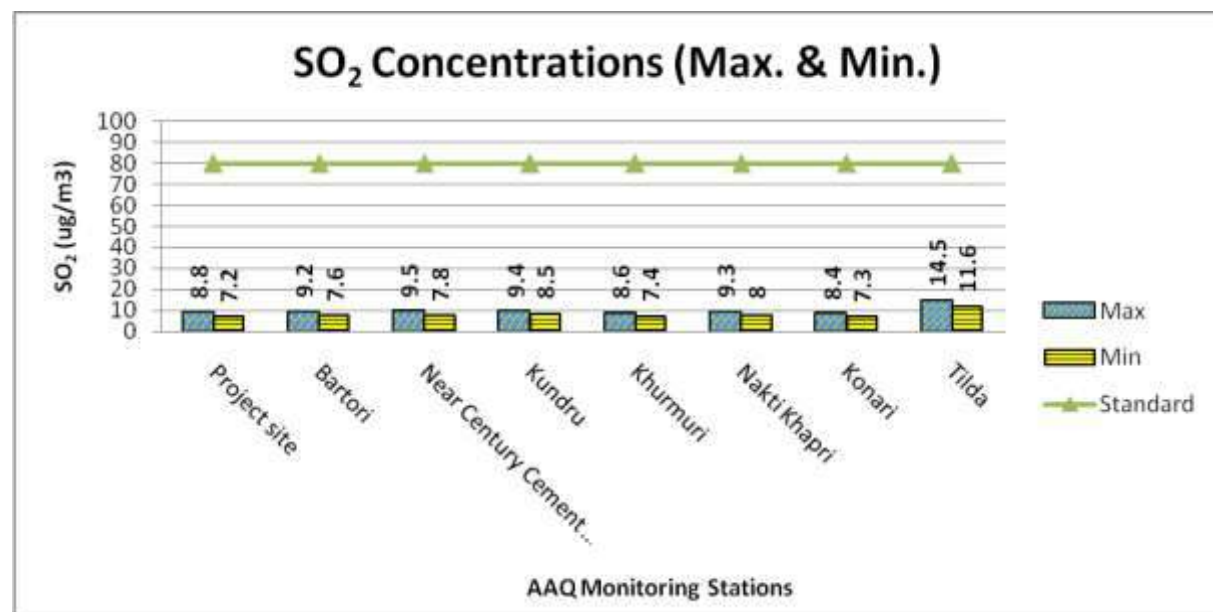
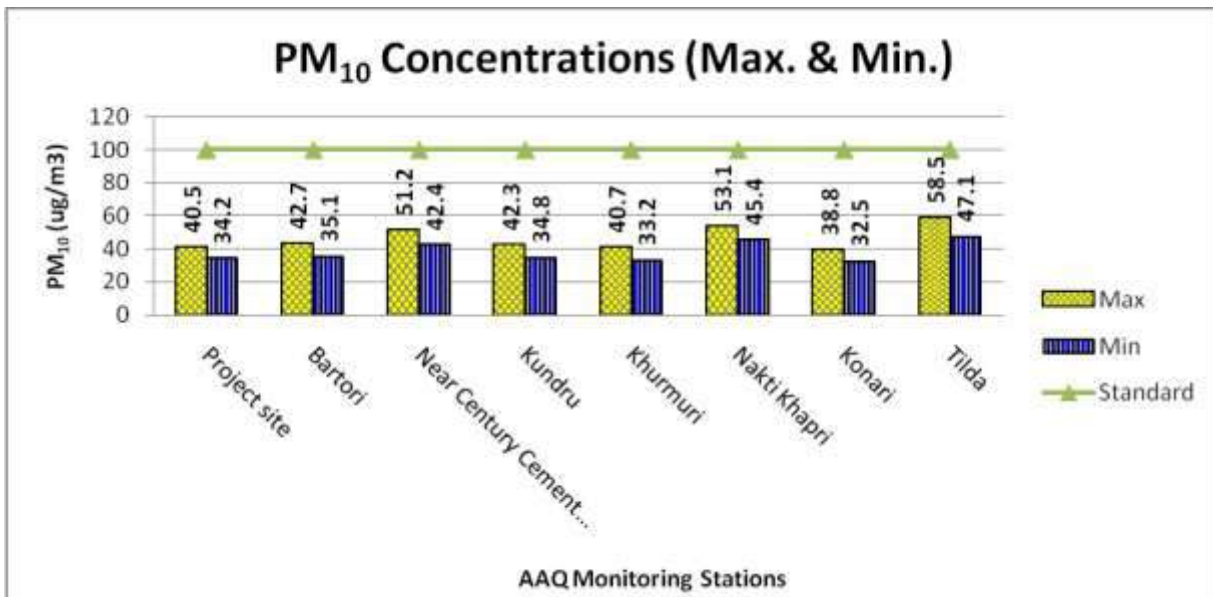
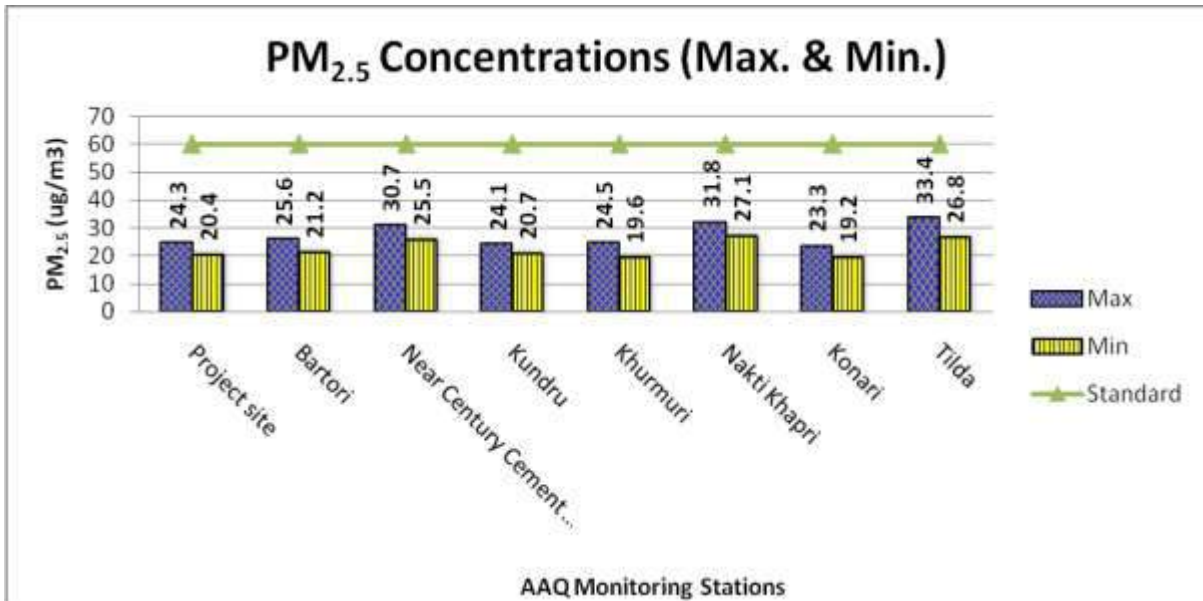
Sampling Location: Nakti khapri Unit : $\mu\text{g}/\text{m}^3$			Sampling Period: Mar.2017 to May.2017	
Parameter	Maximum	Minimum	98 <sup>th</sup> percentile	Standard as per NAAQS
PM <sub>2.5</sub>	31.8	27.1	31.6	60
PM <sub>10</sub>	53.1	45.4	52.8	100
SO <sub>2</sub>	9.3	8.0	9.3	80
NO <sub>x</sub>	12.4	10.9	12.2	80
CO	640	590	638	2000

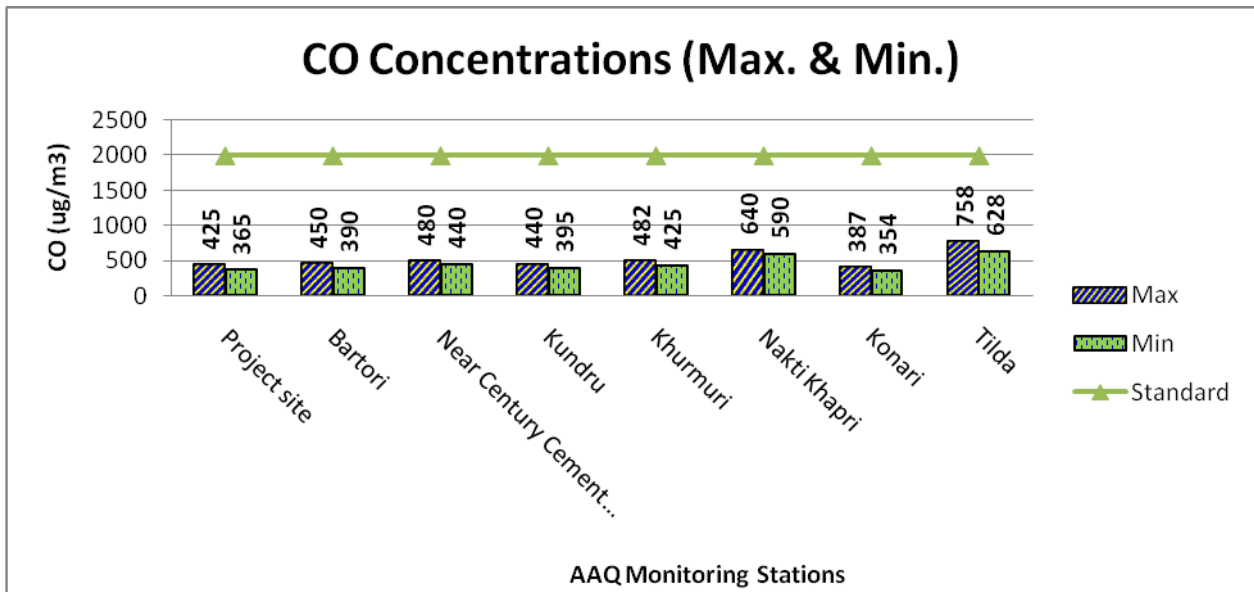
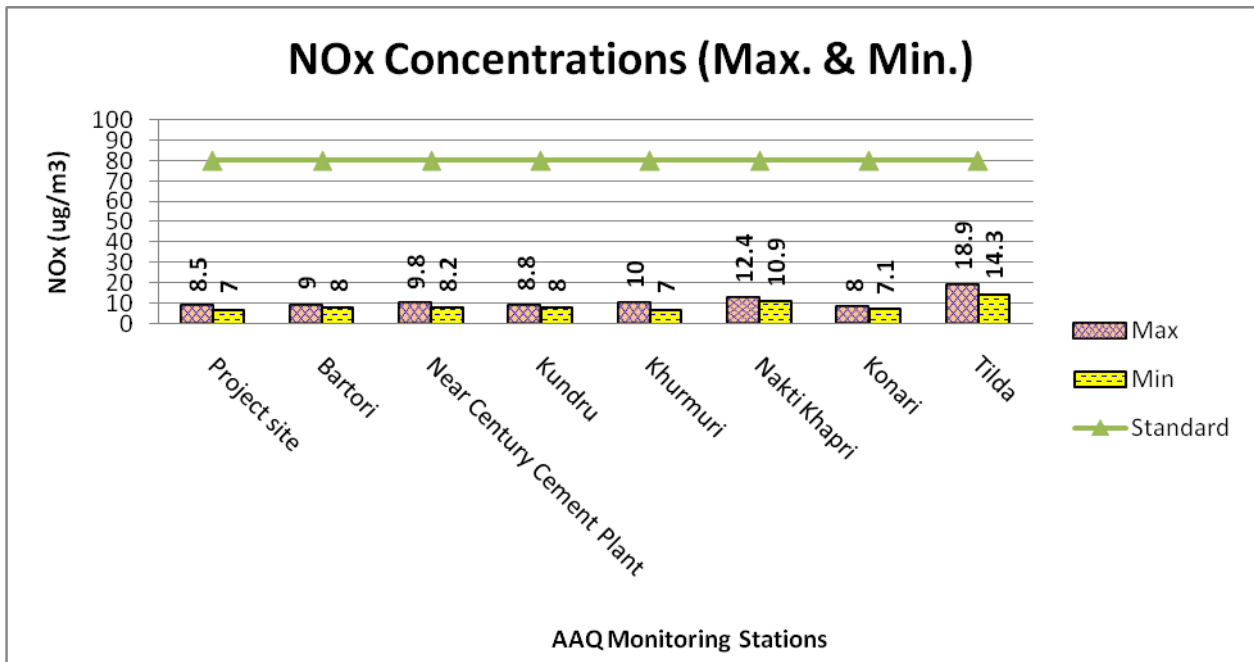
**TABLE 3.1.10**

Sampling Location: Konari Unit : $\mu\text{g}/\text{m}^3$			Sampling Period: Mar.2017 to May.2017	
Parameter	Maximum	Minimum	98 <sup>th</sup> percentile	Standard as per NAAQS
PM <sub>2.5</sub>	23.3	19.2	23.3	60
PM <sub>10</sub>	38.8	32.5	38.5	100
SO <sub>2</sub>	8.4	7.3	8.4	80
NO <sub>x</sub>	8.0	7.1	8	80
CO	387	354	385	2000

**TABLE 3.1.11**

Sampling Location: Tilda Unit : $\mu\text{g}/\text{m}^3$			Sampling Period: Mar.2017 to May.2017	
Parameter	Maximum	Minimum	98 <sup>th</sup> percentile	Standard as per NAAQS
PM <sub>2.5</sub>	33.4	26.8	33.2	60
PM <sub>10</sub>	58.5	47.1	58.4	100
SO <sub>2</sub>	14.5	11.6	14.3	80
NO <sub>x</sub>	18.9	14.3	18.6	80
CO	758	628	754	2000





The 98<sup>th</sup> percentile PM<sub>2.5</sub> concentration recorded at the Project Site is 24.3 µg /m<sup>3</sup>.

The 98<sup>th</sup> percentile PM<sub>10</sub> concentration recorded at the Project Site is 40.4 µg /m<sup>3</sup>.

The 98<sup>th</sup> percentile SO<sub>2</sub> concentration recorded at the Project Site is 8.8 µg/m<sup>3</sup>.

The 98<sup>th</sup> percentile NOx concentration recorded at the Project Site is 8.4 µg/m<sup>3</sup>.

The 98<sup>th</sup> percentile CO concentration recorded at the Project Site is 419 µg /m<sup>3</sup>.

The highest 98<sup>th</sup> percentile PM<sub>2.5</sub> concentration was recorded at Tilda Town with a value of 33.4 µg/m<sup>3</sup>.

The highest 98<sup>th</sup> percentile PM<sub>10</sub> concentration was recorded at Tilda Town with a value of 58.5 µg/m<sup>3</sup>.

The highest 98<sup>th</sup> percentile SO<sub>2</sub> concentration was recorded at Tilda Town with a value of 14.5 µg/m<sup>3</sup>.

The highest 98<sup>th</sup> percentile NO<sub>x</sub> concentration was recorded at Tilda Town with a value of 18.9 µg/m<sup>3</sup>.

The 98<sup>th</sup> percentile CO concentration recorded at the Tilda Town is 758 µg /m<sup>3</sup>.

### **3.3 NOISE ENVIRONMENT**

The physical description of sound concerns its loudness as a function of frequency. Noise in general is sound, which is composed of many frequency components of various loudness distributed over the audible frequency range. Various noise scales have been introduced to describe, in a single number, the response of an average human being to a complex sound made up various frequencies at different loudness levels. The most common and heavily favoured of those scales is the A weighted decibel (dBA). This is more suitable for audible range of 20 to 20,000 Hertz. The scale has been designed to weigh various components of noise according to the response of a human ear.

The impact of noise sources on surrounding community depends on

- Characteristics of noise sources (instantaneous, intermittent or continuous in nature). It is well known that steady noise not as annoying as one that is continuously varying in loudness.
- The time, at which noise occurs, for example loud noise levels at night in residential areas are not acceptable because of sleep disturbance.
- The location of the noise source, with respect to noise sensitive area, which determines the loudness and period of noise exposure.

The environmental impact of noise can have several effects varying from Noise Induced Hearing Loss (NIHL) to annoyance depending on loudness of Noise levels.

The environmental impact assessment of noise from the proposed project can be carried out by taking into consideration of various factors: potential damage to hearing, potential physiological responses, and annoyance and general community responses.

The main objective of noise level monitoring is to assess the background noise levels in different zones viz., industrial, commercial, residential and silence zones within the study area.

The basic studies conducted were

- a. Assessment of background noise levels.
- b. Identification and monitoring the major noise generating sources in the study area.
- c. Impact of noise on general population in the study zone of 10 Km. radius.

### **3.3.1 RECONNAISSANCE**

Noise levels were measured at different locations within 10 Km. radius of the plant such as villages, bus stands etc.

#### **3.3.1.1 BACKGROUND NOISE**

Baseline noise data has been measured at different locations using A-weighted sound pressure level meter. The equivalent day-night noise levels in the study zone are ranging from **39.25 dBA to 59.10 dBA**.

#### **3.3.1.2 SOURCES OF NOISE**

Typical considerations in environmental noise assessment can be divided into two categories; one is related to noise sources and the other related to potential receiver.

Two quantities are needed to describe completely the strength of the source. They are sound Power level and directivity. Sound Power levels measures the total sound Power radiated by the source in all directions where as directivity is a measure of difference in radiation with direction. This concept of sound Power level and directivity index makes it possible to calculate the sound pressure level created by the source.

### **3.3.2 COMMUNITY NOISE**

The ambient noise level is characterized by significant variations above a base or a residual noise level. The residual noise level is that level below which the ambient noise

does not seem to drop during a given time interval and is generally caused by the unidentified distant sources. It differs in rural and urban areas. At night, its level is low due to lesser elements of noise. The annoyance that people experience depends upon the number of noise elements that produce noise concurrently at a given time that occur during a time interval.

The noise rating developed by EPA for specification of community noise from all sources is the day night sound level, Ldn. It is similar to a 24 hour equivalent sound level except that during the night period, which extends from 10.00 p.m. to 6.00 a.m. A 10 dBA weighing penalty is added to the account for the fact that noise at night when people are trying to sleep is judged more annoying than the same noise during the day time.

The Ldn for a given location in a community is calculated from an hourly equivalent sound level given by the following equation.

$$Ldn = 10 \log (1/24 [15 (10^{(Ld/10)}) + 9 (10^{(Ln+10)/10})])$$

Where Ld is the equivalent noise level during day time (6A .M. to 10 P.M.)

Ln is the equivalent noise level during night time (10 P.M. to 6 A.M.)

### **3.3.2.1 OCCUPATIONAL EXPOSURE**

To assess the magnitude of impact due to noise sources, it is essential to know the following:

- a. The duration of sound.
- b. Distribution through the working day.
- c. Overall noise levels.
- d. It's composition including frequency and intensity at various intervals of time.

Other factors regarding receiver include

- a. The age of the individual.
- b. The sensitivity of the individual.
- c. The efficiency of the protective devices used.

After characterizing the noise sources noise at receiver's location, the impact must be assessed. The environmental impact of noise can lead to the following effects.

- a. Damages the hearing capacity.
- b. Interference in communication.
- c. Interference with work.
- d. Interference with sleep.
- e. Causes annoyance.

**3.3.3 METHODOLOGY ADOPTED FOR NOISE LEVEL OBSERVATION**

For measurement of Ambient Noise level in the Study area, a Digital Sound Level Meter (*Make & Model: Lutron SL-4001*) was used. The instrument was calibrated with a Standard Acoustic calibrator before using in the field. The measurements were carried out continuously for the 24-hour period to obtain hourly equivalent sound pressure level, 1 hour Leq. From these values, day and night time as well as 24-hour Leq values were also calculated. The Leq is the equivalent continuous sound level, which is equivalent to the same sound energy as the fluctuating sound measured in the same period.

**GUIDANCE FOR ASSESSMENT OF REPRESENTATIVENESS AND RELIABILITY OF  
 BASELINE ENVIRONMENTAL ATTRIBUTES**

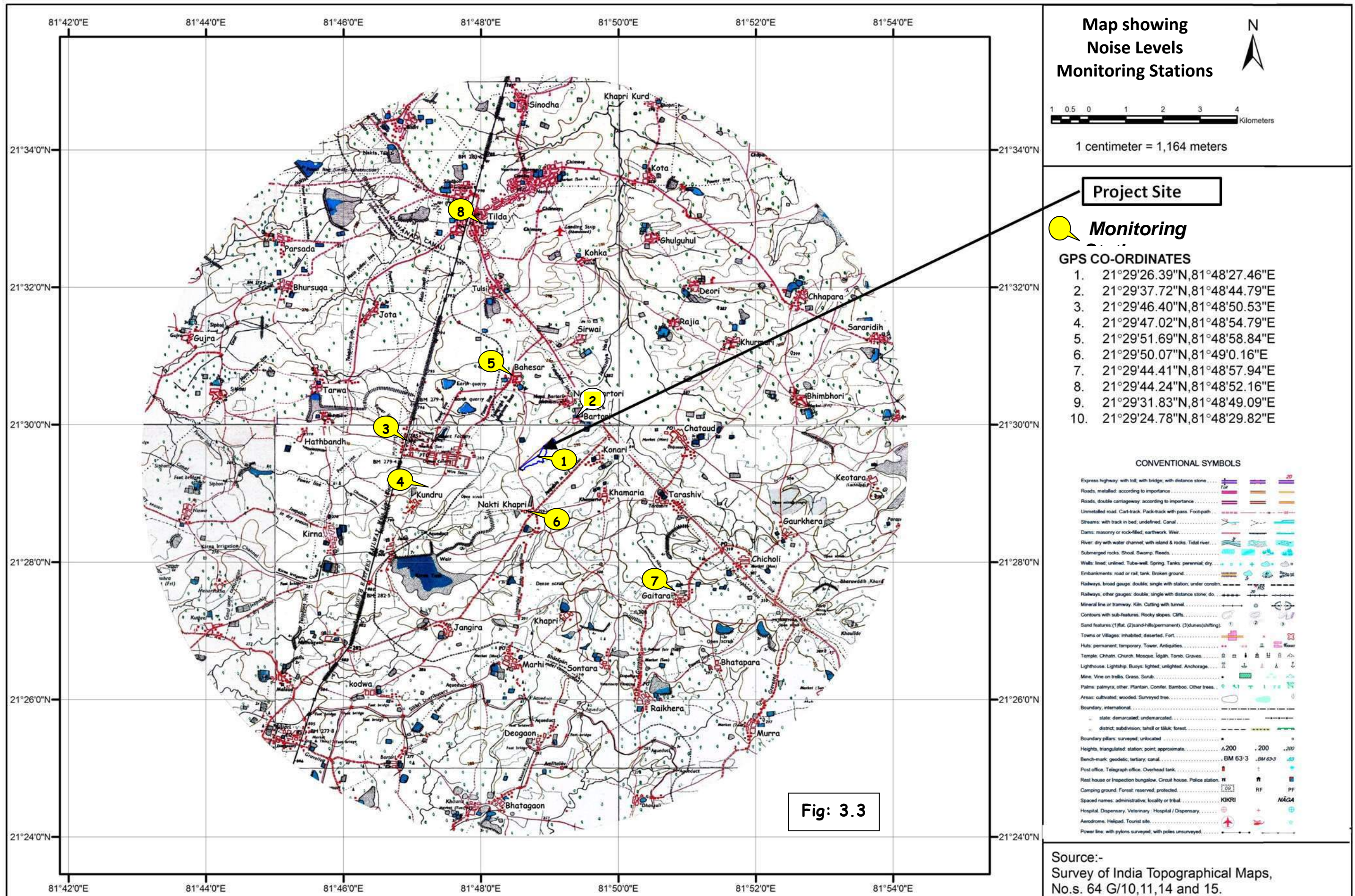
Attributes	Sampling		Measurement Method	Remarks
	Network	Frequency		
Hourly equivalent noise levels	Identified study area	Once in each season	Instrument: Noise level meter	IS:4954-1968 as adopted by CPCB
Hourly equivalent noise levels	In plant (1.5 m from machinery)	Once	Instrument: Noise level meter	CPCB/OSHA
Hourly equivalent noise levels	Highways	Once in each season	Instrument: Noise level meter	CPCB/IS:4954-1968

**3.3.4 NOISE LEVEL OBSERVATIONS IN THE STUDY AREA [TOR # 6 (vii)]**

Baseline noise levels have been monitored at different locations within the study zone of the plant. 8 nos. of stations have been selected for measurement of noise levels and their distances with respect to site are shown in Table 3.2.1.

**TABLE 3.2.1**  
**NOISE LEVEL MONITORING STATIONS**

S.No	STATION	DIRECTION	DISTANCE w.r.t site (in Kms.)	CRITERIA FOR SELECTION
1.	Project Site	---	---	Represents the Project Site
2.	Bartori	NNE	0.4	Represents nearest Habitation
3.	Near Bailkunth R.S.	W	3.0	Represents Commercial Zone
4.	Kundru	SW	2.5	Near to Century Cement plant Colony
5.	Bahesar	NW	2.0	Near to Mining Activity
6.	Nakti khapri	S	1.2	Near to Crusher Plant
7.	Gaitara	SE	5.5	Near to GMR Thermal Power Plant
8.	Tilda	NNW	6.0	Near to Hospital



**Fig: 3.3**

Source:-  
 Survey of India Topographical Maps,  
 No.s. 64 G/10,11,14 and 15.

**TABLE 3.2.2**  
**EQUIVALENT DAY NIGHT NOISE LEVELS**

S.No.	LOCATION	EQUIVALENT NOISE LEVELS (dBA)			Standard
		DAY	NIGHT	DAY-NIGHT	
1.	Project Site	36	32	39.25	<b><u>Residential</u></b> Daytime – 55 dBA Night time – 45 dBA
2.	Bartori	42	36	43.95	
3.	Near Bailkunth R.S.**	60	47	59.10	<b><u>Industrial*</u></b> Daytime – 75 dBA Night time – 70 dBA
4.	Kundru	48	39	48.40	
5.	Bahesar*	55	40	53.71	<b><u>Commercial **</u></b> Daytime – 65 dBA Night time – 55 dBA
6.	Nakti khapri*	60	38	58.12	
7.	Gaitara*	58	41	56.45	<b><u>Silence zone #</u></b> Daytime – 50 dBA Night time – 40 dBA
8.	Tilda#	47	35	46.35	

**Observations:**

- The noise levels monitored at **Project Site** are within the norms prescribed for Residential areas.
- \*The noise levels monitored at **Bahesar, Nakti khapri & Gaitara** are within the norms prescribed for Industrial Zone.
- \*\*The noise levels monitored at **Near Bailkunth R.S.** are within the norms prescribed for Commercial Zone.
- # The noise levels monitored at Silence zone (**i.e. Tilda Town**) is within the norms prescribed for Silence Zone.
- The noise levels monitored at all residential areas are within the norms prescribed for Residential Zone.

**3.4 WATER QUALITY IMPACTS**

**3.4.1 SURFACE WATER QUALITY [Gen.TOR # 6 (iv)]**

There are no major rivers flowing within 10 Km. radius of the study area. Jamuniya nala is flowing at a distance of 1.5 Kms. However there is no water available during the study period. Hence a sample from Kirna Tank (3.2 Kms.) & from Batapara Mahanadi Canal (0.7 Kms.) have been collected and analyzed for various parameters. The analysis is furnished in Table No. 3.3.1.

**TABLE NO. 3.3.1**  
**SURFACE WATER QUALITY ANALYSIS**

S.NO.	PARAMETER	UNIT	Sample from Kirna Tank	Batapara Mahanadi Canal	Standard as per BIS : 2296
<b>PHYSICAL CHARACTERISTICS</b>					
1	Colour	---	-----	-----	-----
2	pH	---	7.9	7.2	6.5-8.5
3	Turbidity	NTU	4.0	5.0	-----
4	Electrical Conductivity	ms/cm	244	179	-----
5	Total Dissolved Solids	mg/l	146	107	500
6	Dissolved Oxygen	mg/l	4.5	5.0	----
<b>CHEMICAL CHARACTERISTICS</b>					
7	Total Hardness	mg/l	195	98	1500
8	Calcium Hardness	mg/l	121	61	200
9	Magnesium Hardness	mg/l	74	37	100
10	Alkalinity	mg/l	107	64	-----
11	Sulphates	mg/l	48	39	400
12	Chlorides	mg/l	76	52	600
13	Nitrates as NO <sub>3</sub>	mg/l	3.8	9.3	20
14	Fluoride as F	mg/l	0.12	0.30	1.5
15	Sodium as Na	mg/l	19	14	-----
16	BOD	mg/l	4.8	3.0	3
17	Residual chlorine	mg/l	<0.01	<0.01	-----
18	Cyanides as CN <sup>-</sup>	mg/l	<0.01	<0.01	0.05
19	Phenols as C <sub>6</sub> H <sub>5</sub> OH	mg/l	Absent	Absent	0.005
20	Hexavalent chromium as Cr	mg/l	<0.01	<0.01	0.05
21	Iron as Fe	mg/l	0.45	0.25	50

22	Copper as Cu	mg/l	<0.01	<0.01	1.5
23	Arsenic as As	mg/l	<0.01	<0.01	0.2
24	Selenium	mg/l	<0.01	<0.01	<0.01
25	Cadmium as cd	mg/l	<0.01	<0.01	<0.01
26	Boron as B	mg/l	<0.01	<0.01	<0.01
27	Mercury as Mg	mg/l	<0.001	<0.001	<0.01
28	Lead as Pb	mg/l	<0.01	<0.01	<0.01
29	Silica as SiO <sub>2</sub>	mg/l	4.5	7.4	----
30	Mineral oil	mg/l	<0.01	<0.01	<0.01
31	Total coliforms	(MPN/100 ml)	206	112	500

### 3.4.2 GROUND WATER QUALITY ANALYSIS [Gen. TOR # 6 (vi)]

The ground water samples have been collected and analyzed for various parameters like pH, Suspended Solids, Total Dissolved Solids, Temperature, Total Hardness, Calcium Hardness, Magnesium hardness, Alkalinity, Fluoride, Chloride, Sulphates, Nitrates, Phenolic compounds, Heavy metals etc. and is compared with the standards to know the water quality. Selection of sampling locations will be generally done based on the following factors:

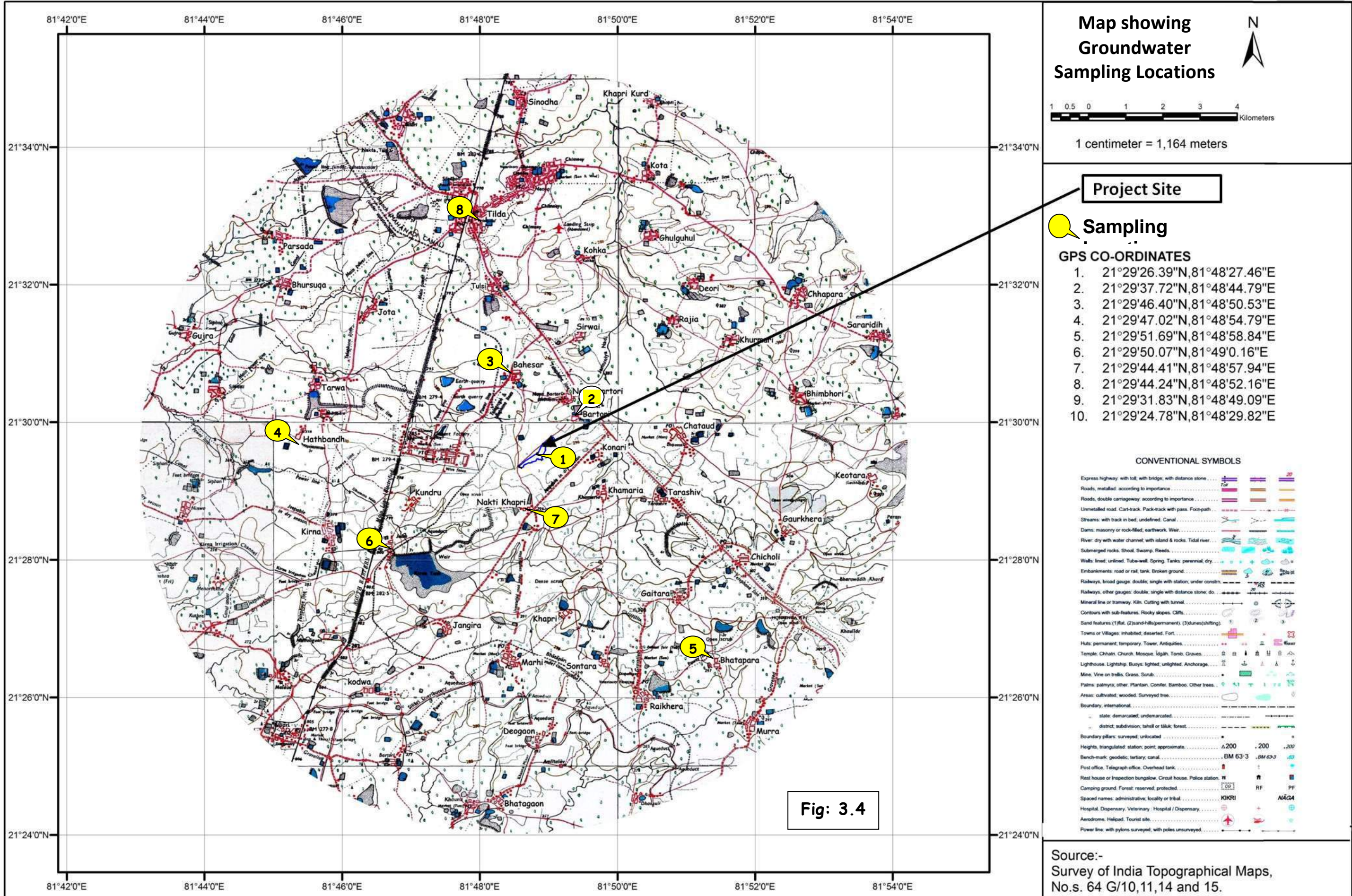
- Representation of project site.
- Topography
- Industrial Areas
- Residential areas
- Agricultural Activity

**Eight (8)** numbers of ground water samples from bore wells were collected from the near by villages to assess ground water quality impacts. The ground water sampling locations and their distances from the project site are shown in Table 3.3.2. These water samples are analyzed for various parameters as per IS: 10500. The ground water characteristics were shown in table Nos. 3.3.3 to 3.3.10. The Ground water sampling stations are shown in **Fig. 3.4.**

**TABLE 3.3.2**  
**GROUND WATER QUALITY SAMPLING STATIONS**

S.No	STATION	DIRECTION w.r.t site	DISTANCE w.r.t site (in Kms.)	CRITERIA FOR SELECTION
1.	Project site	---	---	Borewell sample representing the project site.
2.	Bartori	NNE	0.5	Borewell representing nearby Residential area
3.	Bahesar	NW	1.9	Borewell sample representing Mining activity.
4.	Hathband	W	5.6	Borewell sample representing Agricultural activity & also based on Topography (Downstream)
5.	Bhatapara	SE	7.0	Sample from Govt. Borewell representing Industrial activity & also based on Topography (upstream)
6.	Jalso	SW	3.8	Borewell sample representing Agricultural activity & also based on Topography (Downstream)
7.	Nakti Khapri	S	1.2	Borewell sample representing Residential area (Upstream)
8.	Tilda	NNW	6.0	Borewell sample representing Densely populated & commercial area.

The Groundwater sample analysis indicates that all physical, Chemical & Bacteriological parameters of all the samples collected are within the Potable water standards as per BIS-10500 standards.



Source:-  
 Survey of India Topographical Maps,  
 No.s. 64 G/10,11,14 and 15.

**TABLE 3.3.3**  
**GROUND WATER QUALITY ANALYSIS**

Sampling Location: Project site			Month: Mar. 2017	
S.NO.	PARAMETER	Standard as per IS: 10500 Desirable limit (Permissible limit)	UNIT	SAMPLE
<b>PHYSICAL CHARACTERISTICS</b>				
1.	Colour	5 (25)	Hazen	< 5
2.	Odour	U/O	---	U/O
3.	pH	6.5 – 8.5		7.7
4.	Turbidity	5 (10)	NTU	3.0
5.	Electrical Conductivity	Limit not specified	µs/cm	615
6.	Total Dissolved Solids	500 (2000)	mg/l	368
<b>CHEMICAL CHARACTERISTICS</b>				
7.	Total Hardness	300 (600)	mg/l	227
8.	Calcium Hardness	200 (200 as Ca)	mg/l	141
9.	Magnesium Hardness	30 (100 as Mg)	mg/l	86
10.	Alkalinity	200 (600)	mg/l	138
11.	Sulphates	200 (400)	mg/l	115
12.	Chlorides	250 (1000)	mg/l	198
13.	Nitrates as NO <sub>3</sub>	45 (45)	mg/l	8.6
14.	Fluoride as F	1.0/1.5	mg/l	0.44
15.	Sodium as Na	Limit not specified	mg/l	47
16.	Residual chlorine	0.2	mg/l	<0.01
17.	Cyanides as CN <sup>-</sup>	0.05 (0.05)	mg/l	<0.01
18.	Phenols as C <sub>6</sub> H <sub>5</sub> OH	0.001 (0.002)	mg/l	Absent
19.	Total chromium as Cr	0.05 (0.05)	mg/l	<0.01
20.	Iron as Fe	0.3 (1.0)	mg/l	0.25
21.	Copper as Cu	0.05 (1.5)	mg/l	<0.01
22.	Arsenic as As	0.01 (0.01)	mg/l	<0.01
23.	Selenium as Se	0.01 (0.01)	mg/l	<0.01
24.	Cadmium as cd	0.01 (0.01)	mg/l	<0.01
25.	Boron as B	1.0 (5.0)	mg/l	<0.01
26.	Mercury as Hg	0.001 (0.001)	mg/l	<0.001
27.	Lead as Pb	0.05 (0.05)	mg/l	<0.01
28.	Silica as SiO <sub>2</sub>	---	mg/l	3.0
29.	Manganese as Mn	0.1 (0.3)	Mg/l	<0.01
30.	Anionic detergents as MBAS	0.2 (1.0)	Mg/l	<0.01
31.	Total coliforms	10 (-)	(MPN/100 ml)	Absent

U/O – Unobjectionable

**TABLE 3.3.4**  
**GROUND WATER QUALITY ANALYSIS**

Sampling Location: Bartori			Month: Mar. 2017	
S.NO.	PARAMETER	Standard as per IS: 10500 Desirable limit (Permissible limit)	UNIT	SAMPLE
<b>PHYSICAL CHARACTERISTICS</b>				
1.	Colour	5 (25)	Hazen	< 5
2.	Odour	U/O	--	U/O
3.	pH	6.5 – 8.5		7.8
4.	Turbidity	5 (10)	NTU	3.5
5.	Electrical Conductivity	Limit not specified	µs/cm	625
6.	Total Dissolved Solids	500 (2000)	mg/l	374
<b>CHEMICAL CHARACTERISTICS</b>				
7.	Total Hardness	300 (600)	mg/l	198
8.	Calcium Hardness	200 (200 as Ca)	mg/l	119
9.	Magnesium Hardness	30 (100 as Mg)	mg/l	79
10.	Alkalinity	200 (600)	mg/l	126
11.	Sulphates	200 (400)	mg/l	132
12.	Chlorides	250 (1000)	mg/l	186
13.	Nitrates as NO <sub>3</sub>	45 (45)	mg/l	8.2
14.	Fluoride as F	1.0/1.5	mg/l	0.48
15.	Sodium as Na	Limit not specified	mg/l	41
16.	Residual chlorine	0.2	mg/l	<0.01
17.	Cyanides as CN <sup>-</sup>	0.05 (0.05)	mg/l	<0.01
18.	Phenols as C <sub>6</sub> H <sub>5</sub> OH	0.001 (0.002)	mg/l	Absent
19.	Total chromium as Cr	0.05 (0.05)	mg/l	<0.01
20.	Iron as Fe	0.3 (1.0)	mg/l	0.22
21.	Copper as Cu	0.05 (1.5)	mg/l	<0.01
22.	Arsenic as As	0.01 (0.01)	mg/l	<0.01
23.	Selenium as Se	0.01 (0.01)	mg/l	<0.01
24.	Cadmium as cd	0.01 (0.01)	mg/l	<0.01
25.	Boron as B	1.0 (5.0)	mg/l	<0.01
26.	Mercury as Hg	0.001 (0.001)	mg/l	<0.001
27.	Lead as Pb	0.05 (0.05)	mg/l	<0.01
28.	Silica as SiO <sub>2</sub>	---	mg/l	3.8
29.	Manganese as Mn	0.1 (0.3)	mg/l	<0.01
30.	Anionic detergents as MBAS	0.2 (1.0)	mg/l	<0.01
31.	Total coliforms	10 (-)	(MPN/100 ml)	Absent

**U/O** – Unobjectionable

**TABLE 3.3.5**  
**GROUND WATER QUALITY ANALYSIS**

Sampling Location: Bahesar			Month: Mar. 2017	
S.NO.	PARAMETER	Standard as per IS: 10500 Desirable limit (Permissible limit)	UNIT	SAMPLE
<b>PHYSICAL CHARACTERISTICS</b>				
1.	Colour	5 (25)	Hazen	< 5
2.	Odour	U/O	---	U/O
3.	pH	6.5 – 8.5		8.1
4.	Turbidity	5 (10)	NTU	2.0
5.	Electrical Conductivity	Limit not specified	µs/cm	768
6.	Total Dissolved Solids	500 (2000)	mg/l	460
<b>CHEMICAL CHARACTERISTICS</b>				
7.	Total Hardness	300 (600)	mg/l	203
8.	Calcium Hardness	200 (200 as Ca)	mg/l	122
9.	Magnesium Hardness	30 (100 as Mg)	mg/l	81
10.	Alkalinity	200 (600)	mg/l	115
11.	Sulphates	200 (400)	mg/l	186
12.	Chlorides	250 (1000)	mg/l	205
13.	Nitrates as NO <sub>3</sub>	45 (45)	mg/l	4.6
14.	Fluoride as F	1.0/1.5	mg/l	0.38
15.	Sodium as Na	Limit not specified	mg/l	38
16.	Residual chlorine	0.2	mg/l	<0.01
17.	Cyanides as CN <sup>-</sup>	0.05 (0.05)	mg/l	<0.01
18.	Phenols as C <sub>6</sub> H <sub>5</sub> OH	0.001 (0.002)	mg/l	Absent
19.	Total chromium as Cr	0.05 (0.05)	mg/l	<0.01
20.	Iron as Fe	0.3 (1.0)	mg/l	0.15
21.	Copper as Cu	0.05 (1.5)	mg/l	<0.01
22.	Arsenic as As	0.01 (0.01)	mg/l	<0.01
23.	Selenium as Se	0.01 (0.01)	mg/l	<0.01
24.	Cadmium as cd	0.01 (0.01)	mg/l	<0.01
25.	Boron as B	1.0 (5.0)	mg/l	<0.01
26.	Mercury as Hg	0.001 (0.001)	mg/l	<0.001
27.	Lead as Pb	0.05 (0.05)	mg/l	<0.01
28.	Silica as SiO <sub>2</sub>	---	mg/l	2.5
29.	Manganese as Mn	0.1 (0.3)	Mg/l	<0.01
30.	Anionic detergents as MBAS	0.2 (1.0)	Mg/l	<0.01
31.	Total coliforms	10 (-)	(MPN/100 ml)	Absent

U/O – Unobjectionable

**TABLE 3.3.6**  
**GROUND WATER QUALITY ANALYSIS**

Sampling Location: Hathband		Month: Mar. 2017		
S.NO.	PARAMETER	Standard as per IS: 10500 Desirable limit (Permissible limit)	UNIT	SAMPLE
<b>PHYSICAL CHARACTERISTICS</b>				
1.	Colour	5 (25)	Hazen	< 5
2.	Odour	U/O	---	U/O
3.	pH	6.5 – 8.5		7.5
4.	Turbidity	5 (10)	NTU	3.0
5.	Electrical Conductivity	Limit not specified	µs/cm	821
6.	Total Dissolved Solids	500 (2000)	mg/l	492
<b>CHEMICAL CHARACTERISTICS</b>				
7.	Total Hardness	300 (600)	mg/l	188
8.	Calcium Hardness	200 (200 as Ca)	mg/l	117
9.	Magnesium Hardness	30 (100 as Mg)	mg/l	71
10.	Alkalinity	200 (600)	mg/l	134
11.	Sulphates	200 (400)	mg/l	158
12.	Chlorides	250 (1000)	mg/l	260
13.	Nitrates as NO <sub>3</sub>	45 (45)	mg/l	6.1
14.	Fluoride as F	1.0/1.5	mg/l	0.41
15.	Sodium as Na	Limit not specified	mg/l	54
16.	Residual chlorine	0.2	mg/l	<0.01
17.	Cyanides as CN <sup>-</sup>	0.05 (0.05)	mg/l	<0.01
18.	Phenols as C <sub>6</sub> H <sub>5</sub> OH	0.001 (0.002)	mg/l	Absent
19.	Total chromium as Cr	0.05 (0.05)	mg/l	<0.001
20.	Iron as Fe	0.3 (1.0)	mg/l	0.20
21.	Copper as Cu	0.05 (1.5)	mg/l	<0.01
22.	Arsenic as As	0.01 (0.01)	mg/l	<0.01
23.	Selenium as Se	0.01 (0.01)	mg/l	<0.01
24.	Cadmium as cd	0.01 (0.01)	mg/l	<0.01
25.	Boron as B	1.0 (5.0)	mg/l	<0.01
26.	Mercury as Hg	0.001 (0.001)	mg/l	<0.001
27.	Lead as Pb	0.05 (0.05)	mg/l	<0.01
28.	Silica as SiO <sub>2</sub>	---	mg/l	2.8
29.	Manganese as Mn	0.1 (0.3)	mg/l	<0.01
30.	Anionic detergents as MBAS	0.2 (1.0)	mg/l	<0.01
31.	Total coliforms	10 (-)	(MPN/100 ml)	Absent

U/O – Unobjectionable

**TABLE 3.3.7**  
**GROUND WATER QUALITY ANALYSIS**

Sampling Location: Bhatapara		Month: Mar. 2017		
S.NO.	PARAMETER	Standard as per IS: 10500 Desirable limit (Permissible limit)	UNIT	SAMPLE
<b>PHYSICAL CHARACTERISTICS</b>				
1.	Colour	5 (25)	Hazen	< 5
2.	Odour	U/O	---	U/O
3.	pH	6.5 – 8.5		8.0
4.	Turbidity	5 (10)	NTU	2.0
5.	Electrical Conductivity	Limit not specified	µs/cm	1030
6.	Total Dissolved Solids	500 (2000)	mg/l	616
<b>CHEMICAL CHARACTERISTICS</b>				
7.	Total Hardness	300 (600)	mg/l	324
8.	Calcium Hardness	200 (200 as Ca)	mg/l	198
9.	Magnesium Hardness	30 (100 as Mg)	mg/l	126
10.	Alkalinity	200 (600)	mg/l	108
11.	Sulphates	200 (400)	mg/l	204
12.	Chlorides	250 (1000)	mg/l	320
13.	Nitrates as NO <sub>3</sub>	45 (45)	mg/l	6.2
14.	Fluoride as F	1.0/1.5	mg/l	0.51
15.	Sodium as Na	Limit not specified	mg/l	47
16.	Residual chlorine	0.2	mg/l	<0.01
17.	Cyanides as CN <sup>-</sup>	0.05 (0.05)	mg/l	<0.01
18.	Phenols as C <sub>6</sub> H <sub>5</sub> OH	0.001 (0.002)	mg/l	Absent
19.	Total chromium as Cr	0.05 (0.05)	mg/l	<0.001
20.	Iron as Fe	0.3 (1.0)	mg/l	0.22
21.	Copper as Cu	0.05 (1.5)	mg/l	<0.01
22.	Arsenic as As	0.01 (0.01)	mg/l	<0.01
23.	Selenium as Se	0.01 (0.01)	mg/l	<0.01
24.	Cadmium as cd	0.01 (0.01)	mg/l	<0.01
25.	Boron as B	1.0 (5.0)	mg/l	<0.01
26.	Mercury as Hg	0.001 (0.001)	mg/l	<0.001
27.	Lead as Pb	0.05 (0.05)	mg/l	<0.01
28.	Silica as SiO <sub>2</sub>	---	mg/l	3.0
29.	Manganese as Mn	0.1 (0.3)	mg/l	<0.01
30.	Anionic detergents as MBAS	0.2 (1.0)	mg/l	<0.01
31.	Total coliforms	10 (-)	(MPN/100 ml)	Absent

U/O – Unobjectionable

**TABLE 3.3.8**  
**GROUND WATER QUALITY ANALYSIS**

Sampling Location: Jalso		Month: Mar. 2017		
S.NO.	PARAMETER	Standard as per IS: 10500 Desirable limit (Permissible limit)	UNIT	SAMPLE
<b>PHYSICAL CHARACTERISTICS</b>				
1.	Colour	5 (25)	Hazen	< 5
2.	Odour	U/O	----	U/O
3.	pH	6.5 – 8.5		7.7
4.	Turbidity	5 (10)	NTU	3.0
5.	Electrical Conductivity	Limit not specified	µs/cm	933
6.	Total Dissolved Solids	500 (2000)	mg/l	559
<b>CHEMICAL CHARACTERISTICS</b>				
7.	Total Hardness	300 (600)	mg/l	187
8.	Calcium Hardness	200 (200 as Ca)	mg/l	116
9.	Magnesium Hardness	30 (100 as Mg)	mg/l	71
10.	Alkalinity	200 (600)	mg/l	149
11.	Sulphates	200 (400)	mg/l	198
12.	Chlorides	250 (1000)	mg/l	277
13.	Nitrates as NO <sub>3</sub>	45 (45)	mg/l	2.8
14.	Fluoride as F	1.0/1.5	mg/l	0.28
15.	Sodium as Na	Limit not specified	mg/l	55
16.	Residual chlorine	0.2	mg/l	<0.01
17.	Cyanides as CN <sup>-</sup>	0.05 (0.05)	mg/l	<0.01
18.	Phenols as C <sub>6</sub> H <sub>5</sub> OH	0.001 (0.002)	mg/l	Absent
19.	Total chromium as Cr	0.05 (0.05)	mg/l	<0.001
20.	Iron as Fe	0.3 (1.0)	mg/l	0.17
21.	Copper as Cu	0.05 (1.5)	mg/l	<0.01
22.	Arsenic as As	0.01 (0.01)	mg/l	<0.01
23.	Selenium as Se	0.01 (0.01)	mg/l	<0.01
24.	Cadmium as cd	0.01 (0.01)	mg/l	<0.01
25.	Boron as B	1.0 (5.0)	mg/l	<0.01
26.	Mercury as Hg	0.001 (0.001)	mg/l	<0.001
27.	Lead as Pb	0.05 (0.05)	mg/l	<0.01
28.	Silica as SiO <sub>2</sub>	---	mg/l	2.9
29.	Manganese as Mn	0.1 (0.3)	mg/l	<0.01
30.	Anionic detergents as MBAS	0.2 (1.0)	mg/l	<0.01
31.	Total coliforms	10 (-)	(MPN/100 ml)	Absent

U/O – Unobjectionable

**TABLE 3.3.9**  
**GROUND WATER QUALITY ANALYSIS**

Sampling Location: Nakti Khapri			Month: Mar. 2017	
S.NO.	PARAMETER	Standard as per IS: 10500 Desirable limit (Permissible limit)	UNIT	SAMPLE
<b>PHYSICAL CHARACTERISTICS</b>				
1.	Colour	5 (25)	Hazen	< 5
2.	Odour	U/O	---	U/O
3.	pH	6.5 – 8.5		7.6
4.	Turbidity	5 (10)	NTU	2.8
5.	Electrical Conductivity	Limit not specified	µs/cm	890
6.	Total Dissolved Solids	500 (2000)	mg/l	533
<b>CHEMICAL CHARACTERISTICS</b>				
7.	Total Hardness	300 (600)	mg/l	234
8.	Calcium Hardness	200 (200 as Ca)	mg/l	150
9.	Magnesium Hardness	30 (100 as Mg)	mg/l	84
10.	Alkalinity	200 (600)	mg/l	127
11.	Sulphates	200 (400)	mg/l	198
12.	Chlorides	250 (1000)	mg/l	255
13.	Nitrates as NO <sub>3</sub>	45 (45)	mg/l	7.1
14.	Fluoride as F	1.0/1.5	mg/l	0.40
15.	Sodium as Na	Limit not specified	mg/l	41
16.	Residual chlorine	0.2	mg/l	<0.01
17.	Cyanides as CN <sup>-</sup>	0.05 (0.05)	mg/l	<0.01
18.	Phenols as C <sub>6</sub> H <sub>5</sub> OH	0.001 (0.002)	mg/l	Absent
19.	Total chromium as Cr	0.05 (0.05)	mg/l	<0.01
20.	Iron as Fe	0.3 (1.0)	mg/l	0.22
21.	Copper as Cu	0.05 (1.5)	mg/l	<0.01
22.	Arsenic as As	0.01 (0.01)	mg/l	<0.01
23.	Selenium as Se	0.01 (0.01)	mg/l	<0.01
24.	Cadmium as cd	0.01 (0.01)	mg/l	<0.01
25.	Boron as B	1.0 (5.0)	mg/l	<0.01
26.	Mercury as Hg	0.001 (0.001)	mg/l	<0.001
27.	Lead as Pb	0.05 (0.05)	mg/l	<0.01
28.	Silica as SiO <sub>2</sub>	---	mg/l	3.2
29.	Manganese as Mn	0.1 (0.3)	Mg/l	<0.01
30.	Anionic detergents as MBAS	0.2 (1.0)	Mg/l	<0.01
31.	Total coliforms	10 (-)	(MPN/100 ml)	Absent

U/O – Unobjectionable

**TABLE 3.3.10**  
**GROUND WATER QUALITY ANALYSIS**

Sampling Location: Tilda			Month: Mar. 2017	
S.NO.	PARAMETER	Standard as per IS: 10500 Desirable limit (Permissible limit)	UNIT	SAMPLE
<b>PHYSICAL CHARACTERISTICS</b>				
1.	Colour	5 (25)	Hazen	< 5
2.	Odour	U/O	---	U/O
3.	pH	6.5 – 8.5		7.4
4.	Turbidity	5 (10)	NTU	2.6
5.	Electrical Conductivity	Limit not specified	µs/cm	843
6.	Total Dissolved Solids	500 (2000)	mg/l	505
<b>CHEMICAL CHARACTERISTICS</b>				
6.	Total Hardness	300 (600)	mg/l	176
7.	Calcium Hardness	200 (200 as Ca)	mg/l	109
8.	Magnesium Hardness	30 (100 as Mg)	mg/l	67
9.	Alkalinity	200 (600)	mg/l	144
10.	Sulphates	200 (400)	mg/l	173
11.	Chlorides	250 (1000)	mg/l	256
12.	Nitrates as NO <sub>3</sub>	45 (45)	mg/l	5.2
13.	Fluoride as F	1.0/1.5	mg/l	0.35
14.	Sodium as Na	Limit not specified	mg/l	58
15.	Residual chlorine	0.2	mg/l	<0.01
16.	Cyanides as CN <sup>-</sup>	0.05 (0.05)	mg/l	<0.01
17.	Phenols as C <sub>6</sub> H <sub>5</sub> OH	0.001 (0.002)	mg/l	Absent
18.	Total chromium as Cr	0.05 (0.05)	mg/l	<0.01
19.	Iron as Fe	0.3 (1.0)	mg/l	0.17
20.	Copper as Cu	0.05 (1.5)	mg/l	<0.01
21.	Arsenic as As	0.01 (0.01)	mg/l	<0.01
22.	Selenium as Se	0.01 (0.01)	mg/l	<0.01
23.	Cadmium as cd	0.01 (0.01)	mg/l	<0.01
24.	Boron as B	1.0 (5.0)	mg/l	<0.01
25.	Mercury as Hg	0.001 (0.001)	mg/l	<0.001
26.	Lead as Pb	0.05 (0.05)	mg/l	<0.01
27.	Silica as SiO <sub>2</sub>	---	mg/l	2.2
28.	Manganese as Mn	0.1 (0.3)	Mg/l	<0.01
29.	Anionic detergents as MBAS	0.2 (1.0)	Mg/l	<0.01
30.	Total coliforms	10 (-)	(MPN/100 ml)	Absent

U/O – Unobjectionable

### **3.5 LAND ENVIRONMENT**

#### **3.5.1 GEOLOGICAL & HYDROGEOLOGICAL STATUS OF THE AREA [Gen.TOR # 4 (ix)]**

The district is underlain mainly by two distinct geological formations ranging in age from Achaean to recent. The crystalline rocks occupy major parts of the district comprising of granite, granite gneiss, phyllite, and schist. Granites and phyllites intruded by quartz veins form the basement of the basin. The Chhattisgarh super group overlies granites. The contact between the Achaean and the overlying sedimentary is faulted along the western margin of the basin, which can be confirmed by the presence of highly sheared and brecciated rocks in this region while unconformity lies between these two in the remaining portions of the basin, which can be quite evidenced by the presence of pebbly conglomerate bed at the basal portion of the sedimentaries.

The rocks of Chhattisgarh Super group are unconformably overlying the basement crystalline and are represented by the sandstone, limestone and shale sequence occupying the north central and central part of the district. The rocks of Chhattisgarh super group have been classified into Chandrapur group and Raipur Group. The rocks of Chandrapur group are the oldest of Chhattisgarh Supergroup and can be further divided into three formations viz Lohardih, Choparadih and Kansapathar arranged in the ascending order of superposition. The sequence shows a variable thickness ranging from 20 m to as much as 90 m. The maximum thickness is attained in the SE part, thinning westward as well as in northern side and directly overlying the crystalline basement.

Raipur group comprising a predominantly argillite-carbonate sequence, conformably overlies the Chandrapur group with a gradational contact. Raipur group has been subdivided into six formations representing three cycles of carbonate-argillite sedimentation viz Charmuria and Gunderdehi, Chandi and Tarenga and Hirri and Maniari arranged in the ascending order of superposition. The alluvium deposits in the area are mainly confined all along with the flood plains on either side extending 2 km at places. These comprise mostly gravels, coarse to medium sand and silts. It attains a thickness of 10 to 20 m along Kharun and Seonath River.

Hard rock mainly consist of limestone, shale, dolomite and sandstone belong to Chhattisgarh Supergroup of Proterozoic age. Ground water occurs in phreatic condition in the weathered mantle of these rocks, which extends up to a depth of 25 mbgl. The caverns formed in limestone and dolomites holds good amount of ground water which are limited mostly to around 80 meters. Limestone and dolomite form the main aquifer system in the area. Charmuria limestone and Gunderdehi shale are not very good yielding. Cavernous limestone of Chandi formation forms the good

**3.5.2 MINERAL RESERVES**

There are few Limestone mineral reserves are present in the study area.

**3.5.3 SEISMIC EFFECT**

The project site falls in zone-II of Seismic Zone classification of India.



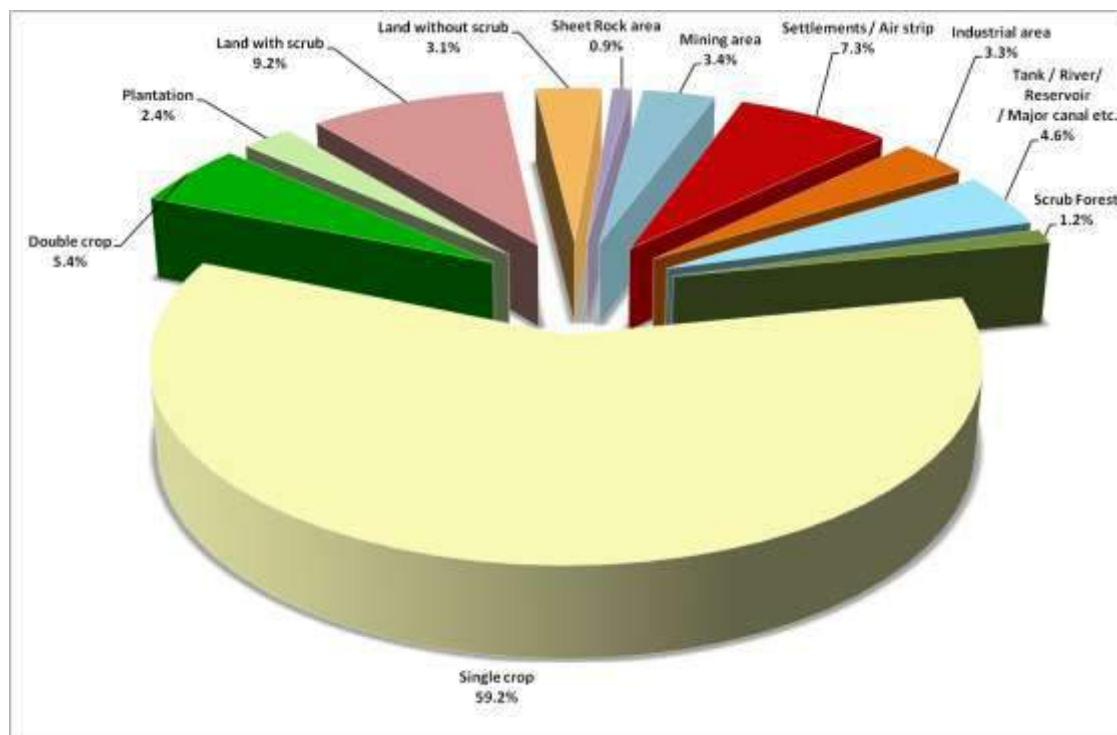
Vikas Metaliks & Energy Limited

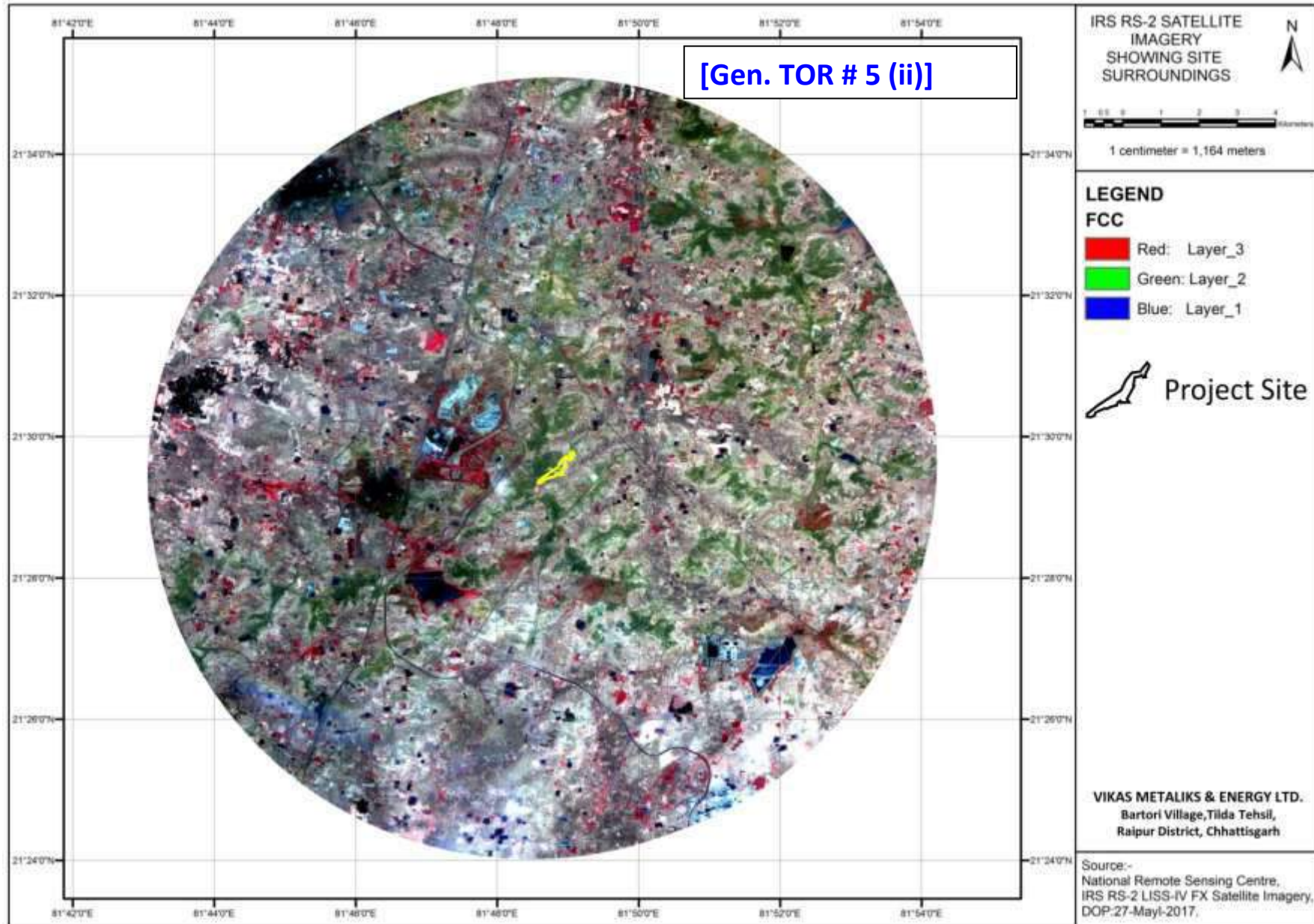
**3.5.4 LAND USE PATTERN [Gen. TOR # 4 (viii)]**

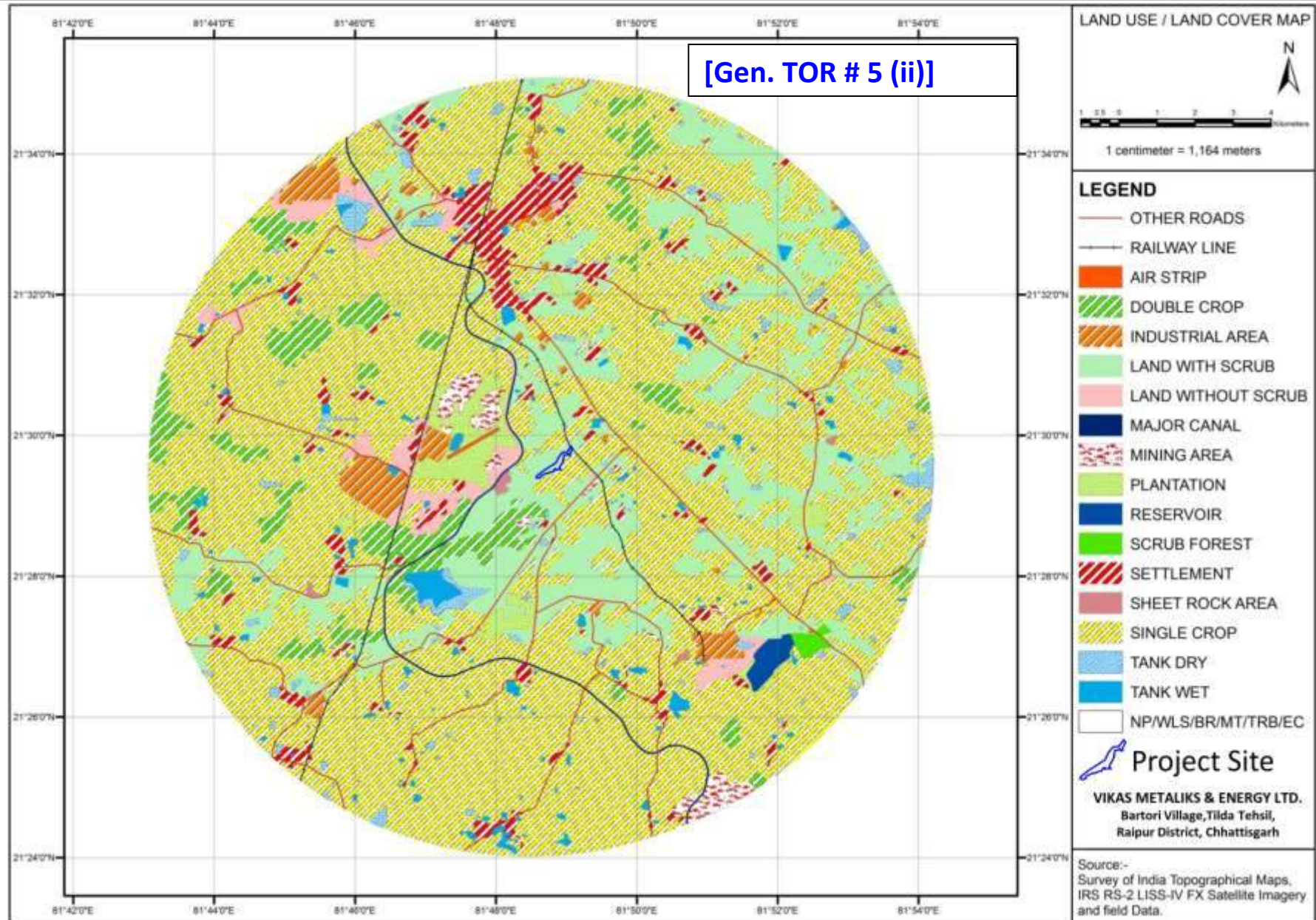
The following is the land use pattern within 10 Km radius of the project site & LULC map, Satellite Imagery and Drainage pattern are shown below:

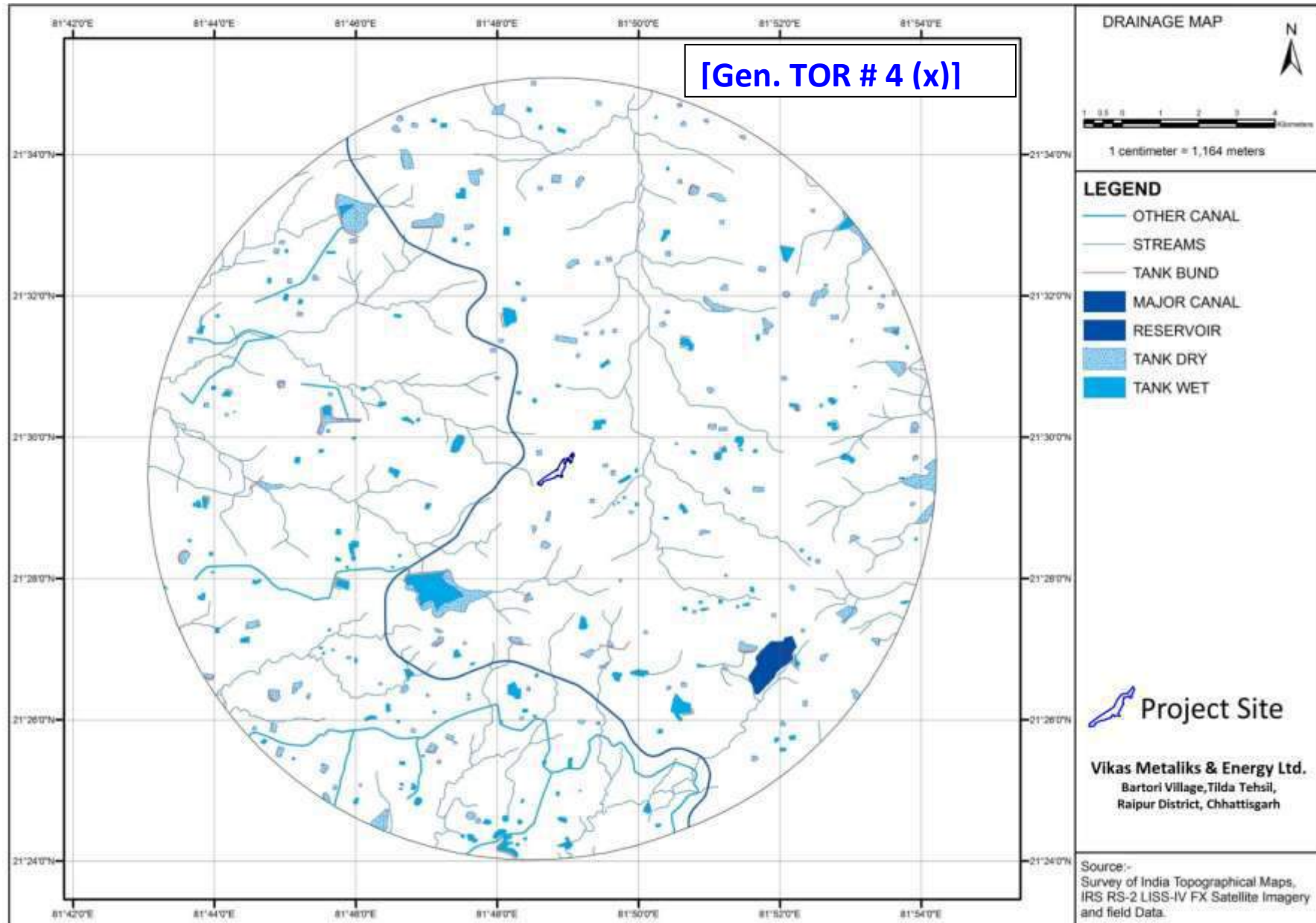
**Table 3.4.1**

S.No.	LAND USE	Area in (Sq. km)	Area in %
1.	<b>BUILT-UP LAND</b>		
	A. Settlements	22.922	7.3
	B. Industrial area	10.362	3.3
2.	<b>WATERBODIES</b>		
	A. Tank / River/ Reservoir/ Major canal etc.	14.444	4.6
3.	<b>FOREST</b>		
	A. Scrub forest	3.768	1.2
4.	<b>CROP LAND</b>		
	A. Single crop	185.888	59.2
	B. Double crop	16.956	5.4
	C. Plantation	7.536	2.4
5.	<b>WASTELANDS</b>		
	A. Land with scrub	28.888	9.2
	B. Land without scrub	9.734	3.1
	C. Sheet rock area	2.826	0.9
	D. Mining area	10.676	3.4
	<b>TOTAL</b>	<b>314</b>	<b>100</b>









### 3.5.4 SOIL ENVIRONMENT [Gen. TOR # 6 (vii)]

Eight (8) no. of soil samples were collected and for analyzed for various parameters like texture, infiltration rate, bulk density, pH, Ca, Mg, Na, K, Zn, Mn etc. The Soil samples are taken from depth of 0 -15 cm will be collected. The Physio-chemical characteristics of soil were analyzed using standard methods.

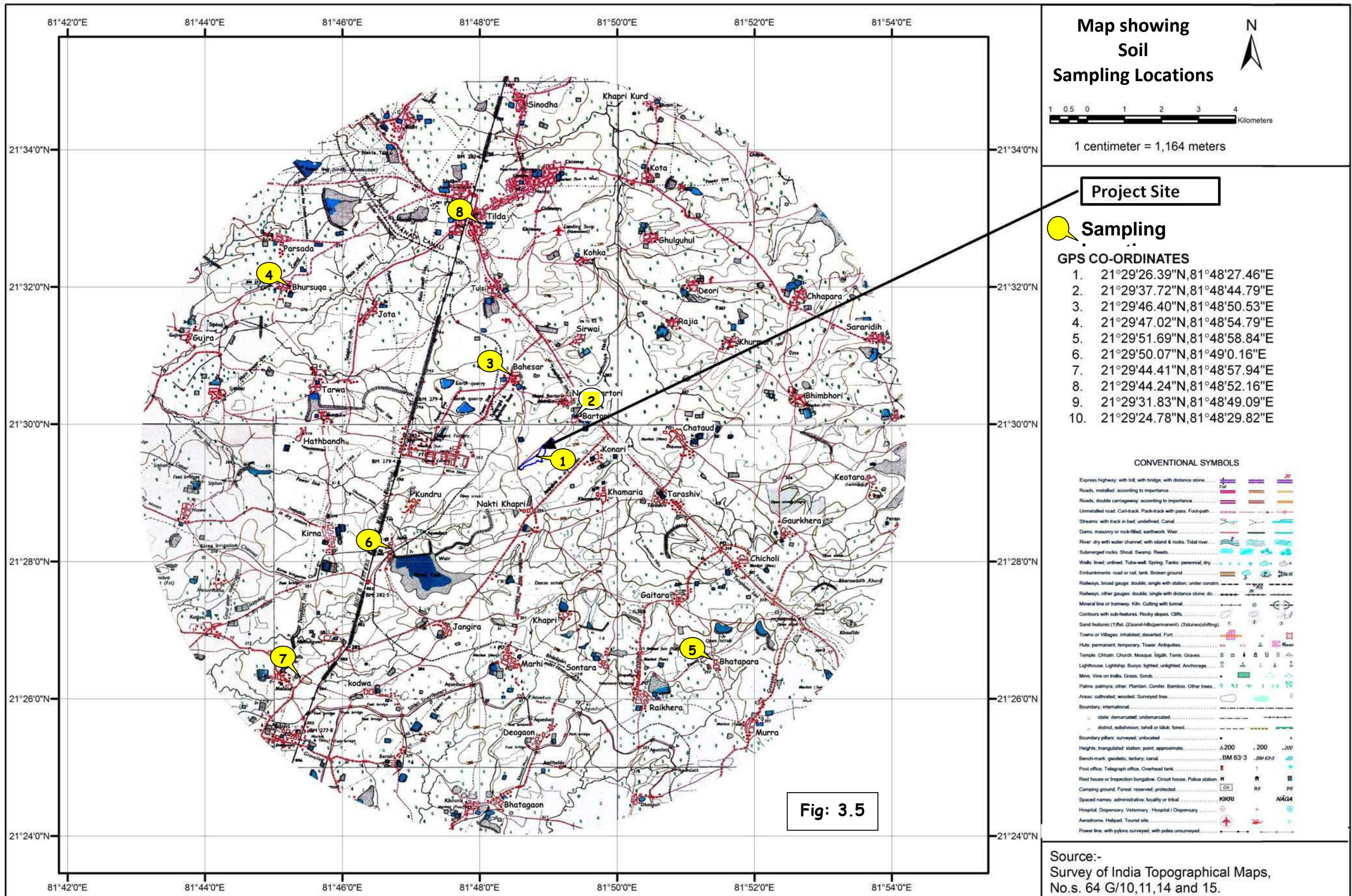
Selection of sampling locations will be generally done based on the following factors:

- Representation of project site.
- Industrial Areas
- Residential areas
- Agricultural Activity
- Proximity to the Forest
- Proximity to Water body

The soil quality sampling locations and their distances from the project site are shown in Table 3.4.2. The soil characteristics are shown in Table No. 3.4.3. The soil quality sampling stations are shown in fig. 3.4.

**TABLE - 3.4.2**  
**SOIL QUALITY SAMPLING STATIONS**

S.No	STATION	DIRECTION w.r.t site	DISTANCE w.r.t site (in Kms.)	CRITERIA FOR SELECTION
1.	Project site	---	---	Sample representing the project site.
2.	Bartori	NNE	0.5	Sample representing nearest Residential area
3.	Bahesar	NW	1.9	Sample representing near to Industrial area
4.	Bursuda	W	5.6	Sample representing Agricultural Activity
5.	Bhatapara	SE	7.0	Sample representing near to Industrial area
6.	Jalso	SW	3.8	Sample representing Agricultural Activity
7.	Malaud	SSW	8.0	Sample representing near to Coal storage area.
8.	Tilda	NNW	6.0	Sample representing Commercial area



**Fig: 3.5**

Source:-  
Survey of India Topographical Maps,  
No.s. 64 G/10,11,14 and 15.

**TABLE 3.4.3**  
**SOIL CHARACTERISTICS**  
**Month: March 2017**

S.No	Parameter	Units	Sampling Locations							
			S1	S2	S3	S4	S5	S6	S7	S8
1.	Bulk Density	g/cc	1.4	1.3	1.6	1.9	1.4	1.5	1.4	1.3
2.	Infiltration rate	cm/sec	1.2	1.5	1.4	1.7	1.3	1.4	1.7	1.4
3.	pH	---	7.3	7.1	7.4	7.6	7.2	7.5	7.3	7.1
4.	Soil type	---	Clay Loamy	Clay Loamy	Clay Loamy	Clay Loamy	Sandy Loam	Clay Loamy	Sandy Loamy	Clay Loamy
5.	Calcium	mg/100 gm	855	902	1075	769	685	816	725	552
6.	Electrical Conductivity	μS/cm	128	156	123	169	188	133	143	177
7.	Nitrogen	Kg/Ha	143	182	214	234	124	195	156	136.5
8.	Potash	Kg/Ha	64	81	96	105	55	87	70	61
9.	Available Phosphorous as P <sub>2</sub> O <sub>5</sub>	Kg/Ha	22	28	33	36	19	30	24	21
10.	Mn	mg/100 gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
11.	Zn	mg/100 gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
12.	Pb	mg/100 gm	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

**Soil Standard Classification**

S.No.	Parameters	Classification
1.	pH	<4.5 extremely acidic 4.51 - 5.0 very strong acidic 5.01 - 5.5 strongly acidic 5.51-6.0 moderately acidic 6.1 - 6.5 slightly acidic 6.51 - 7.3 Neutral 7.31-7.8 slightly alkaline 7.81-8.5 moderately alkaline 8.51 – 9.0 strongly alkaline >9.0 Very strongly alkaline
2.	Nitrogen (Kg/ha)	Up to 50 very less 51-100 less 110-150 good 151-300 better >300 sufficient
3.	Phosphorus (Kg/ha)	Up to 15 very less 15 – 30 less 31-50 medium 51-65 on average sufficient 66-80 sufficient >80 more than sufficient
4.	Potassium (Kg/ha)	0 – 120 very less 120-180 less 180-240 medium 241-300 average 301-360 better >360 more than sufficient

**Interpretation & Conclusion**

Samples collected from identified locations indicate pH value ranging from 7.1 to 7.6, which shows that the soil is neutral to moderately alkaline in nature. Soil texture is mostly Clay loamy in the study area. Total nitrogen ranges from 124 to 214 kg/ha, indicates that nitrogen is sufficiently present in the soil and Phosphorous is present in the range of 19 to 36 kg/ha which is lesser than the average required Phosphorous quantity in few samples and in other samples it is present in medium quantity. Potassium is found to be ranging from 55 to 105 Kg/ha which is much lesser than the required quantity. Hence, the management has decided to supplement Phosphorous and Potassium to the farmers in the area, so that soil fertility and accordingly agriculture yield will increase.

### **3.6 BIOLOGICAL ENVIRONMENT [Gen. TOR # 6 (x)]**

The Biological Environment study has been carried out as a part of the EIA study report to understand the present status of ecosystem prevailing in the study area and to study the floristic and fauna diversity of the terrestrial and aquatic environment of the study area within the 10 km radius of the plant site.

Data collection has been sourced from :

- a) Primary source (i.e. Field study)
- b) Secondary source (i.e. Local habitants, Literature, Internet, concern Govt. departments etc.)

All the collected data were classified to interpret the impact of emissions from the proposed project on the flora and fauna of the region. Survey of the wild plants as well as cultivated crop plants was made and all the available information was recorded.

#### **3.6.1 OBJECTIVES OF THE STUDY**

The present study was undertaken with the following objectives:

- i. To assess the nature and distribution of vegetation in and around the project within the study area.
- ii. To assess the biodiversity of natural system present in the study area.
- iii. Details of flora and fauna, Endemic, Rare, Endangered and Threatened (RET Species) separately for core and buffer area based on such primary field survey and secondary secures and clearly indicating the Schedule of fauna present. In case of any scheduled -I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department.
- iv. To study the likely impact of the proposed project on the Biological Environment and to suggest mitigation measure, if required.

#### **3.6.2 METHODOLOGY OF THE FLORAL AND FAUNAL STUDY**

Biological Environment Study was conducted in the month of March 2017 during Pre Monsoon season by Dr. K. Bayapu Reddy (FAE – EB) & team to assess the list of terrestrial plant and animal species that occur in the core area and the buffer area up to 10 Km

radius from proposed project site. The entire core area has been surveyed for enumeration of flora and fauna. Within the core area 10 quadrats of 5 x 20 m (100 m<sup>2</sup>) each were chosen for phytosociological investigation using restricted random sampling techniques. For the purpose of calculation of Importance Value Indices (IVI) of the core area, quadrat method was used for estimation of frequency and density while the cover was estimated by modified line intercept method. The canopy cover of each species that intercepted or over laid or under laid along a line transect of 500 m was determined based on the total distance intercepted. The average canopy cover was calculated as the percent cover based on four transects of 500 m each.

### 3.6.3 DESCRIPTION OF THE PROJECT SITE & STUDY AREA

Proposed Greenfield project site is located at Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh.

The total land acquired for the proposed project will be 34.26 acres / 13.86 Ha. Khasra nos. of the project site are 149/5, 6, 8, 9, 10, 15, 16, 20, 21, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 158/1, 158/3, 180, 181/3, 215, 217/3.

Following is breakup of the total project area:

S.No.	Land Use	Area (in Acres)	Area (in Ha.)
1.	Plant area	9.76	3.95
2.	Raw Material Storage yard	4.0	1.62
3.	Product Storage yard	2.5	1.01
4.	Solid waste Storage yard	1.2	0.49
5.	Internal roads	1.5	0.61
6.	Greenbelt	11.3	4.57
7.	Water Reservoir & RWH	3.0	1.21
8.	Parking area	1.0	0.40
	<b>Total</b>	<b>34.26</b>	<b>13.86</b>

Out of the total area, about 11.3 acres / 4.57 Ha. is earmarked for Greenbelt development. The land acquired for the proposed project is primarily an agricultural land converted for Industrial purpose. It is more or less a plain land with a gentle slope from South West to North East. Vegetation, flora and fauna of the project site and its surroundings up to a radius of 10 Km were studied. A survey of the flora and fauna of the project site and its environs up to a radius of 10 Km reveals the absence of thick

forests but open scrub type communities were very common. There are no National Parks or Sanctuaries or Biosphere reserves or any other protected or ecologically sensitive areas within a radius of 10 Km from the plant site. The plant site is surrounded by the croplands and wastelands, residential areas, irrigation canal.

As per LULC of the study area, following is land use within 10 Km. radius :

Settlements - 7.3 %; Industrial Area - 3.3 %; Tank / River / Reservoir / Major canal etc. – 4.6 %; Scrub Forest - 1.2 %; Single crop - 59.2 %; Double crop - 5.4 %; Plantation – 2.4 %; Land with scrub – 9.2 %; Land without scrub – 3.1 %; Sheet rock area – 0.9 %; Mining area – 3.4 %.

Bilari Reserved Forest (9.8 Km.) is present within the study area.

No major rivers exists within 10 Km. radius of the project site, however Jamuniya Nallah (1.5 Kms.) and Mahanadi Bhatapara Branch Canal (0.6 Kms.) are present within the study area.

### 3.6.4 DETAILS OF FLORA IN THE STUDY AREA

The Flora species listed below are found in a radius of about 10 Km from the site of the project site. It is evident from the lists of flora that there were no endemic or endangered species of plants.

#### List of trees, shrubs and perennial climbers found in the buffer zone of the Industry

Botanical name	Local / common name	Family
<i>Acacia rugata</i>	Sheekakai	Mimosaceae
<i>Aegle marmelos</i>	Bel	Rutaceae
<i>Ailanthus excelsa</i>	Mahaneem	Simaroubaceae
<i>Alangium salvifolium</i>	Akol	Cornaceae
<i>Albizia lebeck</i>	Siris / Kala sirus	Mimosaceae
<i>Alstonia scholaris</i>	Chhatiana	Apocynaceae
<i>Azadirachta indica</i>	Neem	Meliaceae
<i>Bauhinia purpurea</i>	Kanchan	Caesalpiniaceae
<i>Bauhinia racemosa</i>	Ambansia	Caesalpiniaceae
<i>Butea monosperma</i>	Palash	Fabaceae
<i>Cassia fistula</i>	Amaltas	Caesalpiniaceae
<i>Cassia siamea</i>	Chakhunda	Caesalpiniaceae
<i>Cochlospermum religiosum</i>	Galgal	Bixaceae
<i>Cordia macleodii</i>	Dahivas	Boraginaceae
<i>Cryptolepis buchanani</i>	Karbel / nagabel	Asclepiadaceae
<i>Delonix regia</i>	Krisnachuda / Gulmohur	Caesalpiniaceae
<i>Diospyros melanoxylon</i>	Tendu	Ebenaceae

Botanical name	Local / common name	Family
<i>Ficus benghalensis</i>	Banyan / Bata / Bad	Moraceae
<i>Ficus religiosa</i>	Peepal	Moraceae
<i>Gmelina arborea</i>	Gambhari	Verbenaceae
<i>Grevillea robusta</i>	Silver Oak	Proteaceae
<i>Lagerstroemia parviflora</i>	Sidha / Sudha / Senha	Lythraceae
<i>Melia azadirachata</i>	Buckain	Meliaceae
<i>Morus alba</i>	Mulberry	Moraceae
<i>Polyalthia longifolia</i>	Debadaru / Ashok	Annonaceae
<i>Polyalthia pendula</i>	Ashok	Annonaceae
<i>Pongamia pinnata</i>	Karanja	Fabaceae
<i>Tamarindus indica</i>	Imli	Caesalpiniaceae
<i>Terminalia arjuna</i>	Arjun / kahu/ koha	Combretaceae
<i>Terminalia bellerica</i>	Baheda	Combretaceae
<i>Ventilago calyculata</i>	Kevati	Rhamnaceae
<i>Ziziphus rugosa</i>	Irni, churani	Rhamanaceae
<i>Ziziphus xylopyrus</i>	Ghont / Ghoti	Rhamanaceae

### **Analysis of Flora**

As per the study carried out and Botanical Survey of India, it is found that No Endemic, Rare, Endangered and Threatened (RET) species of flora were found in the study area.

### **3.6.5 DETAILS OF FAUNA IN THE STUDY AREA**

The Fauna species listed below are found in a radius of about 10 Km from the site of the project site.

**List of vertebrate species other than birds either recorded or reported in the study area. Secondary data is based on the information from the locals and published literature relevant to the area.**

<b>MAMMALS</b>		
Latin name	Common name	WPA Schedule
<i>Bandicota indica</i>	Large bandicoot Rat	V
<i>Funambulus palmarum</i>	Three striped squirrel	IV
<i>Herpestes edwardsi</i>	Indian grey mongoose	IV
<i>Lepus nigricollis</i>	Indian hare	IV
<i>Mus booduga</i>	Common Indian field mouse	V
<i>Mus musculus</i>	Home Mouse	V
<i>Nosokia indica</i>	Bandicoot rat	V
<i>Rattus rattus</i>	Common Indian rat	V
<i>Suncus murinus</i>	House shrew	V

<b>AMPHIBIANS</b>		
<i>Bufo melanostictus</i>	Common toad	IV
<i>Fejervarya limnocharis</i>	Rice field frog	IV
<i>Hoplobatrachus tigerinus</i>	Indian Bull frog	IV
<i>Rana cyanophlyctis</i>	Skipper frog	IV
<i>Hyla arborea</i>	Tree frog	IV
<i>Polypedates maculatus</i>	Common tree frog	IV
<b>REPTILES</b>		
<i>Bungarus caeruleus</i>	Common Indian Krait	IV
<i>Chameleo zeylanicus</i>	Chameleon	IV
<i>Chrysopelea taprobanica</i>	Tree Snake	IV
<i>Calotes versicolor</i>	Garden lizard	IV
<i>Dryphis nasutus</i>	Whip Snake	IV
<i>Eutropis carinata</i>	Indain grass Skink	IV
<i>Eutropis multifasciata</i>	Common skink	IV
<i>Hemidactylus flaviviridis</i>	Indian wall lizard	IV
<i>Ptyas mucosa</i>	Dhaman / Indian Rat snake	IV
<i>Typhlops diardii</i>	Giant Blind Snake	IV

**List of birds either spotted or reported from the study area**

<b>Latin name</b>	<b>Common name</b>	<b>WPA Schedule</b>
<i>Acridotheris tristis</i>	Common myna	IV
<i>Actitis hypoleucos</i>	Common Sandpiper	IV
<i>Aegithinia tiphia</i>	Common lora	IV
<i>Artamus fuscus</i>	Ashy Woodswallow	IV
<i>Bubulcus ibis</i>	Cattle Egret	IV
<i>Caprimulgus affinis</i>	Savanna Nightjar	IV
<i>Chalcophaps indica</i>	Emerald Dove	IV
<i>Charadrius dubius</i>	Little Ringed Plover	IV
<i>Charadrius hiaticula</i>	Common Ringed Plover	IV
<i>Columba livia</i>	Blue rock pigeon	IV
<i>Coracias benghalensis</i>	Indian roller	IV
<i>Corvus splendens</i>	House crow	V
<i>Coturnix coturnix</i>	Common Quail	IV
<i>Cuculus canorus</i>	Common Cuckoo	IV
<i>Cuculus micropterus</i>	Indian Cuckoo	IV
<i>Cypsiurus balasiensis</i>	Asian Palm Swift	IV
<i>Dendrocitta vagabunda</i>	Indian tree pie	IV
<i>Dendrocopus marhatensis</i>	Maratha Woodpecker	IV
<i>Egretta garzetta</i>	Little egret	IV
<i>Elanus caeruleus</i>	Black-winged Kite	IV
<i>Eudynamys scolopaceus</i>	Common Koel	IV
<i>Falco tinnunculus</i>	Common Kestrel	IV
<i>Halcyon pileata</i>	Black-capped Kingfisher	IV
<i>Halcyon smyrnensis</i>	White-Breasted King fisher	IV

Latin name	Common name	WPA Schedule
<i>Haliastur indus</i>	Brahminy Kite	IV
<i>Hierococcyx varius</i>	Common Hawk Cuckoo	IV
<i>Himantopus himantopus</i>	Black-winged Stilt	IV
<i>Hydrophasianus chirurgus</i>	Pheasant-tailed Jacana	IV
<i>Ictinaetus malaiensis</i>	Black Eagle	IV
<i>Lalage melanoptera</i>	Black-headed Cuckoo shrike	IV
<i>Lanius cristatus</i>	Brown Shrike	IV
<i>Merops orientalis</i>	Little Green Bee Eater	IV
<i>Microcarbo niger</i>	Little Cormorant	IV
<i>Milvus migrans</i>	Common Black kite	IV
<i>Motacilla alba</i>	White wagtail	IV
<i>Passer domesticus</i>	House sparrow	IV
<i>Perdica asiatica</i>	Bush quail	IV
<i>Pericrocotus cinnamomeus</i>	Small Minivet	IV
<i>Pericrocotus roseus</i>	Rosy Minivet	IV
<i>Psilopogon haemacephalus</i>	Coppersmith Barbet	IV
<i>Psittacula cyanocephala</i>	Blossom headed Parakeet	IV
<i>Pycnonotus cafer</i>	Red-vented bulbul	IV
<i>Rhipidura albicollis</i>	White-throated Fantail	IV
<i>Saxicolodides fulicata</i>	Indian robin	IV
<i>Streptopelia capicola</i>	Ring-necked dove	IV
<i>Streptopelia chinensis</i>	Spotted dove	IV
<i>Streptopelia tranquebarica</i>	Red Collared Dove	IV
<i>Streptopelia tranquebarica</i>	Spotted-necked Dove	IV
<i>Sturnus contra</i>	Pied myna	IV
<i>Sturnus pagodrum</i>	Brahminy myna	IV
<i>Surniculus lugubris</i>	Drongo Cuckoo	IV
<i>Tringa glareola</i>	Wood Sandpiper	IV
<i>Turdoides caudatus</i>	Common babbler	IV
<i>Tyto alba</i>	Barn owl	IV
<i>Tyto longimembris</i>	Eastern Grass Owl	IV
<i>Upupa epops</i>	Common hoopoe	IV

**List of butterflies and insects spotted in the study area by survey team**

<b>Butterflies</b>		
Latin name	Common name	WPA Schedule
<i>Precis lemonias lemonias</i>	Lemon pansy	IV
<i>Precis hierta hierta</i>	Yellow Pansy	IV
<i>Tros aristolochiae</i>	Common rose	IV
<i>Euploea corecor</i>	Common Crow	IV
<i>Dananus aglea</i>	Glassy Blue Tiger	IV
<i>Precis orithya</i>	Blue pansy	IV
<i>Neptis hylas</i>	Common sailor	IV
<i>Papilio demoleus</i>	Lime butterfly	IV

<i>Catopsilia crocale</i>	Common emigrant	IV
<b>Other insects</b>		
<i>Anax imperator</i>	Emperor Dragonfly	Not listed
<i>Tettigonia viridissima</i>	Common Grasshopper	Not listed
<i>Hieroglyphus banian</i>	Rice grasshopper	Not listed
<i>Pecilocerus pictus.</i>	Common painted	Not listed
<i>Nephotettix apicalis</i>	Paddy Jassids	Not listed
<i>Hyblea parea</i>	Skeletonizer or Teak Defoliator	Not listed
<i>Spodoptera mauritia</i>	Swarming caterpillar	Not listed
<i>Rhopalosiphum maidis</i>	Aphids	Not listed

**Analysis of Flora**

As per the study carried out and Wildlife Protection Act, no Schedule – I fauna was observed in the study area.

**3.6.6 INTERPRETATION OF BIOLOGICAL ENVIRONMENT STUDY**

- As per the study carried out and Botanical Survey of India, it is found that No Endemic, Rare, Endangered and Threatened (RET) species of flora were found in the study area.
- As per the study carried out and Wildlife Protection Act, no Schedule – I fauna was observed in the study area.

Prediction of impacts is based both on the direct & indirect; short-term as well as long-term; irreversible & reversible impacts that are most likely to occur owing to the proposed industrial activity during establishment and operation. Following are ecological factors that are considered most significant as far as the impact on flora and fauna are concerned:

- Whether there shall be any reduction in species diversity
- Whether there shall be any habitat loss or fragmentation
- Whether there shall be any additional risk or threat to the rare or endangered or endemic or threatened (REET) species
- Whether there shall be any impairment of ecological functions such as (i) disruption of food chains, (ii) decline in species population and or (iii) alterations in predator-prey relationships.

S.No.	Factor/Objective	Remark
(a)	Whether there shall be any	No

	reduction in species diversity	Land use of the proposed project site is Land with scrub only and it is also observed that no Endemic, Rare, Endangered and Threatened (RET) species of flora were found in the entire study area listed by Botanical Survey of India and also no Schedule – I fauna was observed in the entire study area as recognised in Wildlife Protection Act & IUCN.
(b)	Whether there shall be any habitat loss or fragmentation	No <ul style="list-style-type: none"> <li>Proposed project site and study area does not come under the any specific habitat for specific species.</li> <li>Study area is not the part of any Elephant corridors / Migratory routes for birds etc.</li> </ul>
(c)	Whether there shall be any additional risk or threat to the rare or endangered or endemic or threatened (REET) species	No <ul style="list-style-type: none"> <li>As per the study carried out and Botanical Survey of India, it is found that No Endemic, Rare, Endangered and Threatened (RET) species of flora were found in the study area.</li> <li>As per the study carried out and Wildlife Protection Act, no Schedule – I fauna was observed in the study area.</li> </ul>
(d)	Whether there shall be any impairment of ecological functions such as (i) disruption of food chains, (ii) decline in species population and or (iii) alterations in predator-prey relationships.	No <p>In the proposed project following environment protection measures will be provided for duly complying with norms stipulated by MOEF&amp;CC / CECB:</p> <ul style="list-style-type: none"> <li>ESP will be provided to DRI Kilns to bring down the particulate emission to less than 50 mg/Nm<sup>3</sup>.</li> <li>ESP will be provided to Power plant to bring down the particulate emission to less than 30 mg/Nm<sup>3</sup>.</li> <li>Fume Extraction &amp; Cleaning system with</li> </ul>

		<p>bagfilters will be provided to SMS and Reheating Furnace to bring down the particulate matter emission to less than 50 mg/Nm<sup>3</sup>.</p> <ul style="list-style-type: none"> <li>• All conveyor will be covered with GI sheets to control the dust emission. Interlocking system will be provided to ESP. This will ensure that whenever ESP fails, the raw material feed to the unit will be stopped and will commence production after ESP is rectified to comply with the norms.</li> <li>• Net resultant Ground level concentrations during operation of the plant after superimposing the incremental concentrations over the maximum baseline concentrations are well within the National Ambient Air Quality Standards.</li> <li>• Zero liquid effluent discharge will be implemented in the proposed project.</li> <li>• Greenbelt will be developed in 11.3 acres of land which will further mitigate the emissions.</li> <li>• All these environmental protection systems will be installed and operated to comply with the norms.</li> </ul>
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**3.7 SOCIAL IMPACT ASSESSMENT [Spec. TOR iii, Gen. TOR # 6 (xi)]**

In view of the fact that the development is an ever growing process, its impact is also ever increasing, leading to rapid deterioration in environmental conditional and human health. Impact assessment thus ensures that the potential problems are foreseen and addressed at an early stage in the projects plant and design. Environment Impact Assessment (EIA) & Social Impact Assessment provides a rational approach to sustainable development.

Social Impact Assessment includes the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, and developmental activities) on individual, social groups and community at large and any social change processes invoked by those interventions.

### **3.7.1 LEGISLATIVE & REGULATORY CONSIDERATIONS**

According to the Specific TOR point no. iii, in the TOR letter issued by Ministry of Environment, Forest and Climate Change (MoEF&CC) Vide No. J-11011 / 80 / 2008-IA-II (I) dated 7<sup>th</sup> February 2017.

*“The project proponent should carry out Social Impact Assessment of the project as per the Office Memorandum No. J-11013/25/2014-IA.I dated 11.08.2014 issued by the Ministry regarding guidelines on Environment Sustainability and CSR issues. The Social Impact assessment study so carried should form part of EIA and EMP report”*

Towards the fulfilment of the above TOR, Functional Area Expert and his team has prepared the Social Impact Assessment report

### **3.7.2 OBJECTIVE**

The primary objectives of the Social Impact Assessment study are:

- Understanding the baseline socio-economic environment obtaining in the impact zone.
- Identifying the key stakeholders who are likely to be impacted by the establishment of the proposed project.
- Predicting the positive and negative impacts of the project on the socio-economic environment in the area.
- Suggesting mitigation measures to minimize the negative impacts.

### **3.7.3 SCOPE**

In keeping with its objectives, the scope of the study extends to:

- Making a reconnaissance of the villages and human settlements within the 10 km radius from the proposed project site.
- Understanding the overall socio-economic profile of the impact area.
- Assessing the baseline socio-economic environment prevailing in the impact area focusing the core and buffer zones.
- Identifying key economic sectors and major sources of livelihood in the study area.
- Understanding social structures and lifestyles of people in the area who are likely to be affected the most by the proposed project.

- Assessing physical and social infrastructure facilities accessible to inhabitants in the project impact area.
- Predicting the likely socio-economic impacts as a consequence of establishing the project.
- Suggesting adverse impact mitigation measures in line with the felt needs, aspirations and expectations of the project affected population.
- Preparing an appropriate Socio Economic Environment Management Plan.

#### **3.7.4 APPROACH & METHODOLOGY**

The basic approach for carrying out the SIA is focused on:

- Zeroing-in on the project impact area, covering all the villages and other habitations falling within the 10 km radius from the project site.
- Collecting basic information with respect to constituent villages in terms of census village code, name of the Tehsil in which a particular village falls, number of households, population level (as per Census 2011) and growth of village population during the last decade, distance from the proposed project site etc.
- Identifying critical knowledge/information gaps which impede an objective and reliable assessment of the socio-economic impacts of the project.
- Zeroing-in on the data/information to be collected for a fair impact assessment and deciding upon the sources and means to collecting the same.
- Identifying the key stakeholders and potential respondents for collecting the required information.
- Drawing a sampling frame and sample size specifying villages and number of households to be contacted for primary data/information collection and agencies to be contacted for eliciting information on various aspects relevant to the study.
- Assessing the views raised in the Public Hearing and developing a plan (consisting of Cost, Budget, Monitoring and Evaluation) to implement the needs of people as per Public hearing outcome.

#### **Methodology**

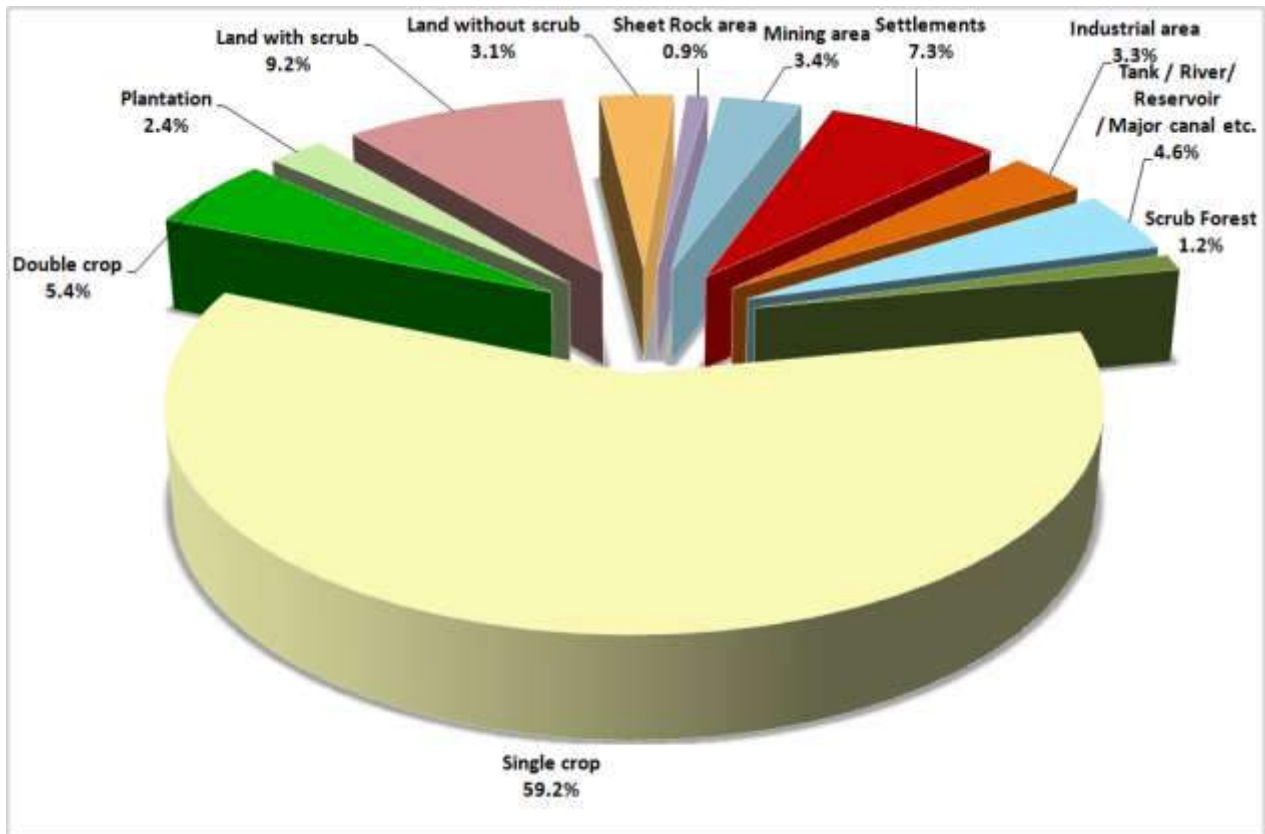
- The Social Impact Assessment (SIA) of the proposed project is relied on a judicious mix of Secondary (i.e. Census 2011, Govt. Dept., Maps and Literature Research)

and Primary data (i.e. Field survey and Interview / Interactions) collected from different sources.

- Various socio-economic aspects considered for impact assessment include livelihoods, relocation and rehabilitation, incomes, employment, skills, education, health and overall lifestyles. The cultural aspects considered are archaeological, historical, religious and aesthetic places of importance, arts and crafts etc.
- The SIA was carried out in the three distinct stage:
  - i. Desktop review / research
  - ii. Field Survey
  - iii. Data Analysis & its interpretation

### **3.7.5 STUDY AREA**

The coverage of study extends to all the 50 Census villages and towns falling within the 10 km. radius, from the proposed project site, as mandated by MoEF&CC's ToR. The study area is 314 Sq. Km. The land utilisation pattern of the study area shows the dominance of single crop land accounting for 59.2 %. The land under human settlement covers an area of 22.9 Sq. Km. , which is mere 7.3 % of the total area. The detailed land use pattern of the study area is given below:



### 3.7.6 PROJECT IMPACT ZONES

The geographical area for impact assessment extends over 10 Kms. Radius from the project site and comprises of 50 Villages and towns. To facilitate a more realistic and objective assessment, the 50 villages / towns are categorized into three zones:

- Core zone (within 2.0 Kms. Radial distance from the project site)
- Buffer zone (> 2 – 5 Kms.)
- Transition zone (> 5 – 10 Kms.)

The key demographic features of the villages / towns in the three impact zones are shown below:

S.No.	Village Name	Distance from Project Site (In Kms.)	Direction from Project site	Total Households	Population					
					Total	Male	Female	SC	ST	Average Literacy (%)
<b>Villages within 0 - 2 Kms distance from the project site</b>										
1	Bartori	0.4	NE	272	1202	606	596	465	76	57%
2	Nakti Khapri	1.5	S	152	735	365	370	368	0	63%
<i>Sub Total : I</i>				424	1937	971	966	833	76	59%
<b>Villages within 2 - 5 Kms distance from the project site</b>										
3	Bahesar	2.1	N	343	1694	847	847	593	25	67%
4	Chhataud	4.5	NEE	461	2219	1070	1149	231	40	60%
5	Jalso	4.2	SW	200	932	478	454	20	87	63%
6	Khamaria	2.2	SE	264	1252	612	640	80	287	62%
7	Konari	2.3	E	154	772	403	369	8	0	70%
8	Kundru	3.5	SW	916	4016	2071	1945	411	205	74%
9	Sirwai (Sirwe)	3.3	NE	232	1172	580	592	153	277	60%
10	Tarashiv	4.0	EES	322	1460	726	734	64	0	69%
11	Tulsi	4.8	NNW	916	4292	2196	2096	650	150	70%
<i>Sub Total : II</i>				3465	16115	8136	7979	1617	1046	75%
<b>Villages within 5 - 10 Kms distance from the project site</b>										
12	Bartori 2	8.5	SSW	285	1573	769	804	2	125	63%
13	Bhatagaon	8.6	S	340	1499	754	745	1150	31	60%
14	Bhatapara	7.5	SE	129	712	357	355	0	58	67%
15	Bhimbhori	7.4	NE	290	1446	726	720	72	69	65%
16	Bhursuda	7.6	NW	235	1202	584	618	233	0	62%
17	Biladi	9.5	NW	729	3259	1629	1630	790	386	55%
18	Chhapara	8.2	NE	240	1187	589	598	339	0	70%
19	Chicholi	6.3	SE	236	1103	539	564	472	11	58%
20	Deogaon	7.5	S	281	1245	613	632	388	84	60%
21	Deori	6.4	NE	294	1376	711	665	86	0	72%
22	Dhansuli	9.5	SE	254	1241	607	634	310	13	59%
23	Gaitara	5.5	SE	199	892	456	436	427	29	60%
24	Gaurkhera	7.0	EES	163	853	425	428	77	24	65%
25	Ghulguhul	6.4	NE	187	858	448	410	43	0	68%
26	Hathbandh	5.8	W	174	769	407	362	197	0	66%
27	Jota	5.2	NW	230	1078	537	541	381	0	60%
28	Keotara	9.0	E	297	1469	758	711	674	151	65%
29	Khapri Kurd	9.8	NNE	139	676	333	343	10	66	66%

30	Khauna	8.7	S	786	3745	1894	1851	933	176	60%
31	Khurmuri	6.2	NE	200	969	506	463	235	0	63%
32	Kirna	5.2	SW	617	2863	1459	1404	273	129	67%
33	Kodwa	7.4	SW	290	1382	697	685	446	22	70%
34	Kohka	5.3	NE	262	1137	551	586	203	46	69%
35	Kota	8.0	NE	347	1732	882	850	655	0	63%
36	Kuthrel	9.2	SW	270	1204	605	599	588	0	62%
37	Malaud	8.1	SW	373	1818	917	901	448	0	65%
38	Mauhagaon	7.0	SW	256	1255	628	627	893	8	58%
39	Mehar Sakha	8.5	SW	153	779	402	377	116	0	63%
40	Murra	9.2	SE	531	2359	1188	1171	625	20	59%
41	Ninwa	9.0	SW	387	1935	968	967	295	53	67%
42	Parsada	7.7	NW	283	1417	703	714	291	0	63%
43	Raikhera	7.6	SE	696	3541	1734	1807	52	305	61%
44	Rajia (Rajiya)	5.2	NE	199	906	435	471	277	20	63%
45	Siliari Khurd	9.4	SSW	1409	6963	3493	3470	1403	206	64%
46	Silpatti	7.5	WWN	210	1092	572	520	238	44	65%
47	Sinodha	9.5	N	443	2111	1023	1088	306	204	62%
48	Sontara	6.2	SSE	227	1084	543	541	459	0	65%
49	Tarwa (Tandwa)	6.1	WWN	1105	5555	2846	2709	1817	337	67%
50	Tilda	6.3	NNW	7458	36682	18444	18238	6149	1341	70%
<i>Sub Total : III</i>				<i>21204</i>	<i>102967</i>	<i>51732</i>	<i>51235</i>	<i>22353</i>	<i>3958</i>	<i>66%</i>
<b>Total</b>				<b>25093</b>	<b>121019</b>	<b>60839</b>	<b>60180</b>	<b>24803</b>	<b>5080</b>	<b>67%</b>

It is obvious from the above data that only 2 no. of villages fall in core impact zone, accounting for just 1.6 % of the total population in the study area. 9 no. of villages accounting for 13.3 % of the total population fall in buffer impact zone, while 39 no. of villages accounting for 85.1% of the total population fall in transition zone.

Given the nature of the project, its socio-economic impacts will be more pronounced on the people inhabiting the core and buffer impact zones rather than on the transition zone. Hence the study focus was more on the socio-economic conditions obtaining among the households in the core and buffer zones.

### **3.7.7 BASELINE DATA AND ANALYSIS OF SURVEYED VILLAGES**

#### **3.7.7.1 DESKTOP REVIEW / RESEARCH**

A fairly comprehensive desk research to understand the socio-economic setting of the project area was the first initiative towards carrying out SIA. Accordingly, published and unpublished information available on the subject was referred, reviewed and critical information gaps identified by the SIA team.

It was during this stage, the key stakeholders were identified and study instruments – schedules and checklists – prepared, tested and finalised. Similarly, the sampling frame and sample size were also designed and finalised. The sampling frame for the study consisted of villages, households and District and Tehsil level officials, key informants as also local opinion leaders.

*A proportional random sampling technique* was followed to select the sample village's and households. Accordingly, the sample villages were picked up at random from the three impact zones considered – Core, Buffer and Transition. The number of households to be contacted in each sample village was determined on the basis of the size of population of the respective village. In the absence of household level information, the respondent households were selected randomly during the course of visit to the respective village. However, while selecting the respondent households, emphasis was on contacting households, who are economically poor, susceptible to shifts in livelihood patterns and belonged to vulnerable social communities.

To ensure the accuracy of the primary data collected from the study area, all the village specific information was verified from the data of Census 2011 and secondary information collected from various Govt. Dept., Map, Literature etc.

Accordingly following 14 no. of villages have been selected:

1. Bartori
2. Biladi
3. Chhataud
4. Khauna
5. Kirna
6. Kundru
7. Murra
8. Nakti Khapri

9. Raikhera
10. Siliari Khurd
11. Sinodha
12. Tarwa
13. Tilda
14. Tulsi

#### **3.7.7.2 FIELD SURVEY**

Field survey helped in collecting fairly reliable primary data with respect to the major livelihood sources, education, health status, basic amenities and standard of living. It also helped in eliciting information from the natives about the negative environmental impacts of industrial units already existing in the area and the measures initiated by them (industrial units) to mitigate the impacts.

The potential respondents in the sample households were approached personally by members of the core study team and Field Investigators who explained the purpose of the visit and solicited their participation by sharing the intended information unbiasedly. The study team clarified the doubts and addressed the apprehensions expressed by the respondents. Once the respondents were willing and ready to participate, household level socio-economic information was collected with the help of a structured questionnaire. A number of questions were open ended to facilitate capturing perceptions of the respondents objectively.

In addition, Participatory Rapid Assessment (PRA) tools comprising Villages / Town Transect Walks, Focus Group Discussions (FGD), Key Informant Interviews and Local Opinion Leader interviews were used for collecting qualitative information with regards to key socio-economic challenges of the area.

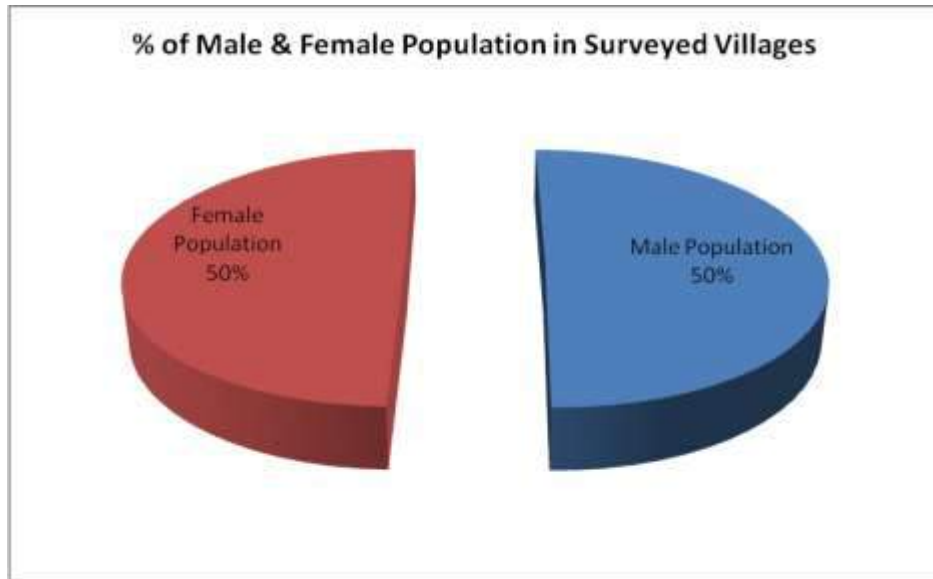
**3.7.7.3 DATA ANALYSIS & ITS INTERPRETATION**

**Demography of the Surveyed villages**

S.No.	Village Name	Total Households	Population						
			Total	Male	Female	SC	ST	Average Literacy (%)	Sex Ratio
1.	Bartori	272	1202	606	596	465	76	57%	983
2.	Biladi	729	3259	1629	1630	790	386	55%	1001
3.	Chhataud	461	2219	1070	1149	231	40	60%	1074
4.	Khauna	786	3745	1894	1851	933	176	60%	977
5.	Kirna	617	2863	1459	1404	273	129	67%	962
6.	Kundru	916	4016	2071	1945	411	205	74%	939
7.	Murra	531	2359	1188	1171	625	20	59%	986
8.	Nakti Khapri	152	735	365	370	368	0	63%	1014
9.	Raikhera	696	3541	1734	1807	52	305	61%	1042
10.	Siliari Khurd	1409	6963	3493	3470	1403	206	64%	993
11.	Sinodha	443	2111	1023	1088	306	204	62%	1064
12.	Tarwa (Tandwa)	1105	5555	2846	2709	1817	337	67%	952
13.	Tilda	7458	36682	18444	18238	6149	1341	70%	989
14.	Tulsi	916	4292	2196	2096	650	150	70%	954
<b>Total</b>		<b>16491</b>	<b>79542</b>	<b>40018</b>	<b>39524</b>	<b>14473</b>	<b>3575</b>	<b>67%</b>	<b>995</b>

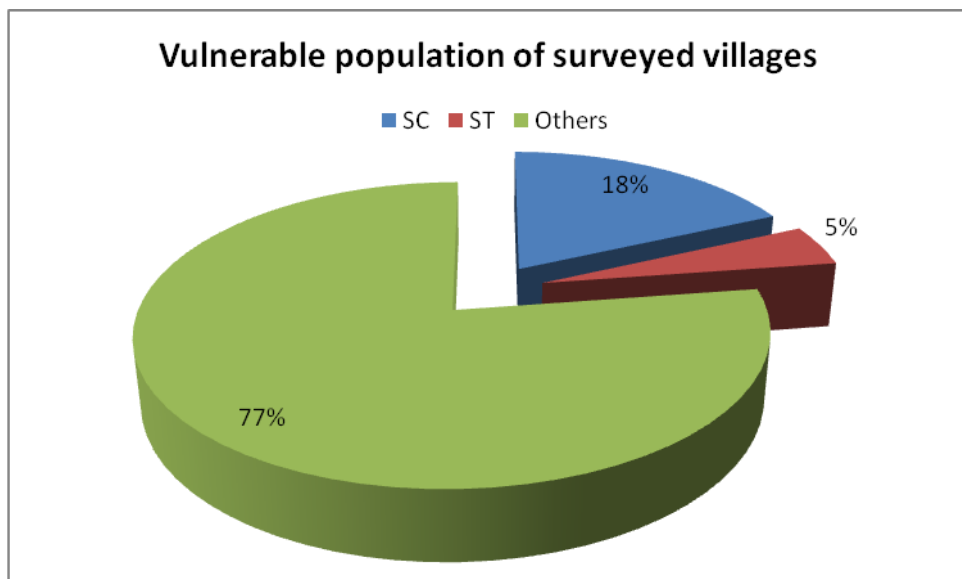
**Population Distribution**

As per analysis of primary data & secondary data the distribution of population varies from place to place. In the study area, Tilda & Siliari Khurd are densely populated areas. Literacy rate in surveyed villages is 67 %. The sex ratio of surveyed villages is 995. Total household population come out to be 79542. Average household size is 4.8. The percentage of Male population is 50.3% and Female population is 49.7% i.e. no major difference lies between Male and Female count.



**Vulnerable Group**

There are particular groups who, for various reasons, are weak and vulnerable or have traditionally been victims of violations and consequently require special protection for the equal and effective enjoyment of their human rights. Such groups fall into reserve category and the Company has to take special measures to uplift the social strata in this section. The surveyed villages have very less count of Schedule tribe and Schedule caste fraction is comparatively high i.e.18%. The category falling in unreserved category shows the major occupancy in the area i.e.77% of the total population.



**Demography of Vulnerable groups**

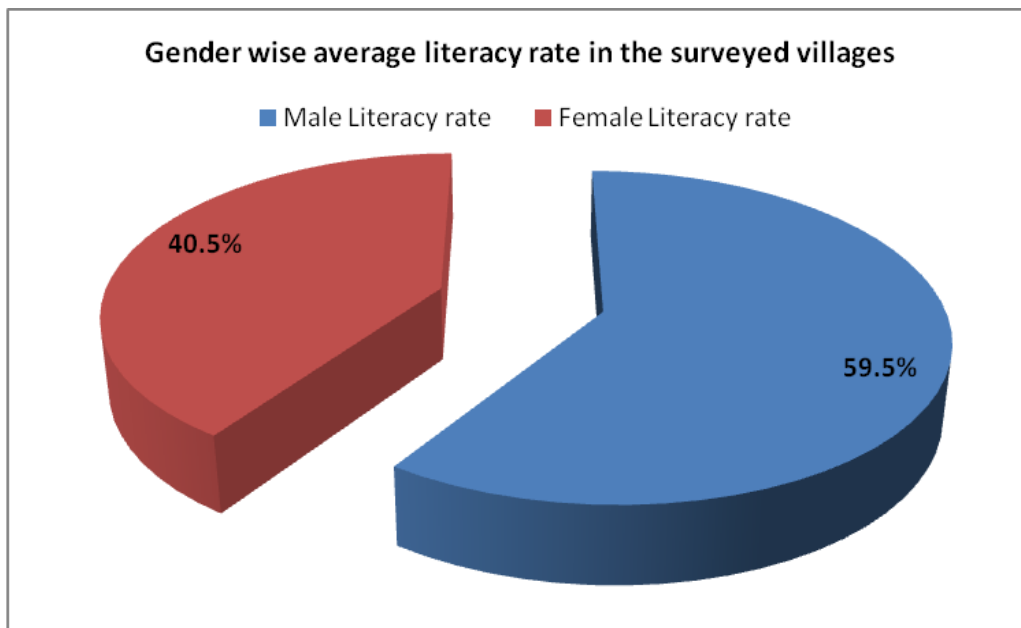
S.No.	Village Name	Total	SC	ST	Others
1	Bartori	1202	465	76	661
2	Biladi	3259	790	386	2083
3	Chhataud	2219	231	40	1948
4	Khauna	3745	933	176	2636
5	Kirna	2863	273	129	2461
6	Kundru	4016	411	205	3400
7	Murra	2359	625	20	1714
8	Nakti Khapri	735	368	0	367
9	Raikhera	3541	52	305	3184
10	Siliari Khurd	6963	1403	206	5354
11	Sinodha	2111	306	204	1601
12	Tarwa (Tandwa)	5555	1817	337	3401
13	Tilda	36682	6149	1341	29192
14	Tulsi	4292	650	150	3492
<b>Total</b>		<b>79542</b>	<b>14473</b>	<b>3575</b>	<b>61494</b>

**Literacy level**

Literacy denotes progress of a nation as a whole. The “multiplier effect” of literacy empowers people, enables them to participate fully in society and contributes to improve livelihoods. Literacy is also a driver for sustainable development in that it enables greater participation in the labour market; improved child and family health and nutrition; reduces poverty and expands life opportunities. In the surveyed villages male literacy is greater than female literacy rate. The Company will make efforts in order to fill the lacunae and indirectly contribute to the progress of the nation. As per the survey, the literacy rate (34.4%) is average in the surveyed villages due to lack of education awareness & education facilities are not adequate so there is a need to create awareness. From the survey it is clear that the literacy rate of female (40.5 %) is lower as compared to male population (59.5 %). Male and female literacy rate of villages vary from place to place. On whole, female literacy level has to be enhanced to provide a balance in the society and pace towards economic progress of the area.

**Literacy rate in the surveyed villages**

S.No.	Name of Vilage	Total Pop.	Total Literate Population	Literacy Rate	Male Literacy	Male Literacy Rate	Female Literacy	Female Literacy rate
1	Bartori	1202	723	60.1%	420	58.1%	303	41.9%
2	Biladi	3259	1797	55.1%	1072	59.7%	725	40.3%
3	Chhataud	2219	646	29.1%	373	57.7%	273	42.3%
4	Khauna	3745	1128	30.1%	630	55.9%	498	44.1%
5	Kirna	2863	1339	46.8%	732	54.7%	607	45.3%
6	Kundru	4016	607	15.1%	348	57.3%	259	42.7%
7	Mura	2359	949	40.2%	540	56.9%	409	43.1%
8	Nakti Khapri	735	555	75.5%	311	56.0%	244	44.0%
9	Raikheda	3541	2170	61.3%	1228	56.6%	942	43.4%
10	Silyari Kurud	6963	710	10.2%	409	57.6%	301	42.4%
11	Sinodha	2111	744	35.2%	423	56.9%	321	43.1%
12	Tandawa	5555	727	13.1%	404	55.6%	323	44.4%
13	Tilda	36682	3003	8.2%	1691	56.3%	1312	43.7%
14	Tulsi	4292	61	1.4%	57	93.4%	4	6.6%
<b>Total / Average</b>		<b>79542</b>	<b>15159</b>	<b>34.4%</b>	<b>8638</b>	<b>59.5%</b>	<b>6521</b>	<b>40.5%</b>



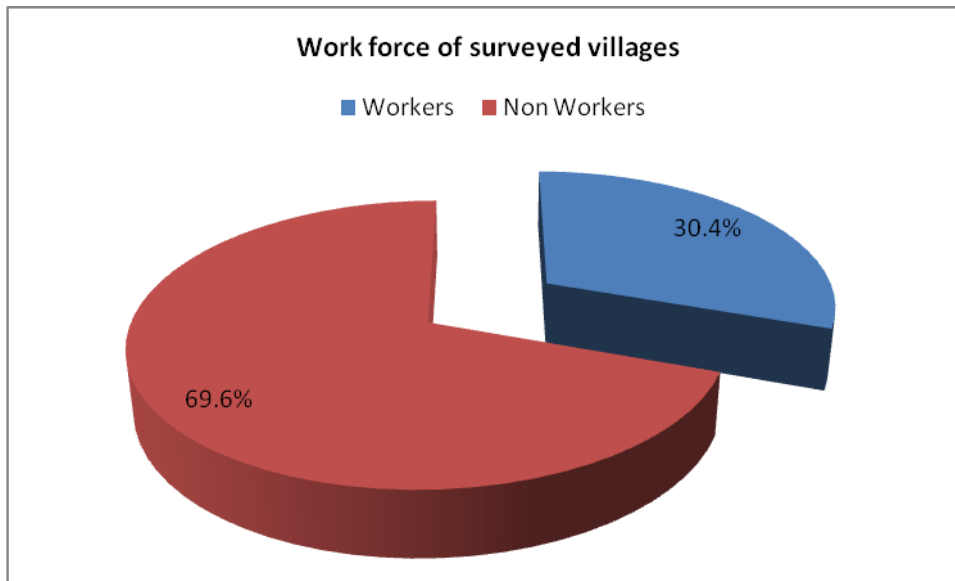
**Economic Activities**

The economy of an area is defined by the occupational pattern and income level of the people in the area. The occupational structure of residents in the study area is studied with reference to work category. The population is divided occupation wise into three categories, viz., main workers, marginal workers and non-workers. The workers include cultivators, agricultural labourers, those engaged in household industry and other services. While the marginal workers are those workers, engaged in some work for a period of less than 180 days during the reference year. The non-workers include those engaged in unpaid household duties, students, retired persons, dependents, beggars, vagrants etc. besides institutional inmates or all other non-workers who do not fall under the above categories.

The percentage of total working population and non-working population is 30.4 % and 69.6 % respectively in the study area.

**Work force of the surveyed villages**

S.No.	Name of Villages	Total Pop.	Total Workers	Main Workers	Marginal Worker	Non Workers
1	Bartori	1202	305	251	216	735
2	Biladi	3259	891	1107	349	1803
3	Chhataud	2219	572	703	321	1195
4	Khauna	3745	994	1451	244	2050
5	Kirna	2863	816	1069	170	1624
6	Kundru	4016	1126	1355	213	2448
7	Mura	2359	594	417	648	1294
8	Nakti Khapri	735	174	92	124	519
9	Raikheda	3541	988	1189	461	1891
10	Silyari Kurud	6963	1893	1868	932	4163
11	Sinodha	2111	515	686	162	1263
12	Tandawa	5555	1442	1237	951	3367
13	Tilda	36682	9870	10889	2189	23604
14	Tulsi	4292	1130	1241	259	2792
	<b>Total</b>	<b>79542</b>	<b>21310</b>	<b>23555</b>	<b>7239</b>	<b>48748</b>



It is evident from the above on the basis of information obtained from surveyed villages that the percentage of total working population is low and dependent population is high. This indicator shows that the economic conditions in the area are not good. They require livelihood opportunities to upgrade their economic status and fulfil basic needs. Vikas Metaliks & Energy Ltd. will provide some direct employment to the local people based on the qualification and will also provide training opportunity for self-employment generation.

### **3.7.8 SOCIO ECONOMIC STATUS**

#### **Livelihoods**

#### **Agriculture**

Agriculture and allied activities are traditionally the most predominant source of livelihood in the area. In the study area, two out of five villages are irrigated. One in four villages has a problem of drinking water and one in three villages say they require irrigation facilities. The people are willing to contribute voluntary labour to build these facilities. The main kharif crop is paddy and the main rabi crop is wheat. Other crops are rabi crop is wheat. Other crops are rabi also grown. One-fourth of the villages express the need to remove encroachments from their land.

### **Industry**

Over the past two decades, industrial growth supported livelihoods complementing the traditional agriculture sector. An estimated 20% of the total workforce in the area depends on the industry sector for livelihood.

With well-planned effort, this sector could help ignite entrepreneurship spirit and create large scale employment opportunities to the educated youth in the area.

### **Services Sector**

Employment in service sector establishments such as Government departments, banks, schools, courts, hospitals and private institutions is also an important source of livelihood.

### **Communication**

A majority of the people also have access to a mobile phones and a cable TV connection. 20% - 30% of the earning population seems to have a personal transport in the form of a 2-wheeler or 4-wheeler. While fashion guided the youth in personal grooming, the aged generally preferred to be traditional.

### **Health and well-being**

Illnesses such as diarrhoea, malaria, jaundice, coughs and colds are prevalent during the Monsoon. Transport becomes a problem during the rainy season and treatment is difficult to get. People want modern facilities and doctors to be available at the health centres.

### **Physical Infrastructure**

All the villages are electrified and are connected with all-weather roads. Autos and mini buses are the most common mode of public transport seen in the villages. State Road Transport Corporation buses are less frequent.

Almost the entire population in the area has access to potable water under rural water supply scheme. All the villages are fluoride free.

### **Social Infrastructure**

Fairly well developed infrastructure exists for pre-primary and primary education at the village level. Over 60% of the villages have easy access to high school and higher secondary education. Facilities for college education are available at Tilda town, while those for engineering and medical education at Raipur city. Well established healthcare facilities are available at Tilda town.

**3.7.9 INTERPRETATION ON SOCIO-ECONOMIC**

S.No.	Impact Parameter	Predicted Impacts		Budget Allocation / Remark
		Positive	Negative	
1	Human Settlement	<ul style="list-style-type: none"> <li>No displacement of people or habitations would occur.</li> </ul>	Nil	----
2	Livelihoods	<ul style="list-style-type: none"> <li>No loss of existing livelihoods. Direct or indirect is expected to occur.</li> <li>Additional non agricultural livelihood opportunities are expected both directly and as spinoffs.</li> </ul>	A moderate influx of people in project construction and operation phases.	Priority will be given local people in employment
3	Employment Generation	<ul style="list-style-type: none"> <li>No loss of existing employment due to the proposed project is expected.</li> <li>Creation of additional employment for about 200 skilled, semi-skilled &amp; unskilled workers during project operation.</li> <li>Indirect employment to about 500 persons as a sequel to income multiplie effect and induced growth during construction &amp; operation phases of the project.</li> <li>Majority of them will be local women and youth.</li> </ul>	Nil	----
4	Incomes and Revenues	<ul style="list-style-type: none"> <li>Improvement of money incomes of locals engaged in tertiary businesses by an average 10 % through induced spending.</li> <li>Improved tax revenues of Gram Panchayat.</li> <li>The successful commissioning and running of the proposed plant will attract more industrial investments which in turn will benefit the society and the nation.</li> </ul>	Nil	----
5	Demographics	<ul style="list-style-type: none"> <li>The population levels of the neighbouring</li> </ul>	Nil	---

		<p>villages are not likely to change in any significant manner.</p> <ul style="list-style-type: none"> <li>• The lifestyles of people are expected to improve in tune with the rise in incomes and improvement in infrastructure facilities.</li> <li>• The skill sets of the local residents are expected to improve in keeping with the emerging employment opportunities.</li> </ul>		
6	Community Health	<ul style="list-style-type: none"> <li>• Health of people residing in all the three impact zones is not likely to be impacted adversely considering the nature of emissions and the state of the art air pollution control systems planned.</li> </ul>	<ul style="list-style-type: none"> <li>• If effective systems are not adopted for fly ash disposal, it may raise community health issues.</li> </ul>	<ul style="list-style-type: none"> <li>• Budget of Rs. 3.0 Crores has been earmarked for solid waste management, which includes silo, for storage of fly ash.</li> </ul>
7	Physical Infrastructure	<ul style="list-style-type: none"> <li>• Road and power network in the area is expected to be strengthened as a sequel to industrial development around.</li> </ul>	<ul style="list-style-type: none"> <li>• If major Increase in vehicular traffic may lead to higher incidence of road accidents.</li> </ul>	---
8	Social Infrastructure	<ul style="list-style-type: none"> <li>• Improvement in housing stock and educational facilities could be expected in the long run as industrialization in the area gains acceleration.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased pressure on residential accommodation, water supply and sanitation in the neighborhood during construction phase due to influx of workers.</li> </ul>	---

### **3.7.10 CONCLUSION**

The Social Impact Assessment of the study area for the surveyed village gives an idea of its population, average household size, literacy rate and sex ratio. Literacy rate is average. A part of population is suffering from lack of regular job to run their day to day life and get basic facilities.

The infrastructure and amenities available in the area denote the economic well being of the region. The study area as a whole possesses average infrastructural facilities. The proposed enhancement & installation will contribute towards the improvement of the socioeconomic status of the surrounding areas.

Vikas Metaliks & Energy Ltd. is committed to contribute in the development of basic need of the local area in order to uplift the social and economic structure of the area. The company will carry out various activities under ESC in the nearby local area like community & infrastructure development programs, Vocational training, Education, Health, Women empowerment etc. *2.5% of the project cost i.e. Rs. 3.2 Crores is earmarked for ESC activities. Detailed break up of activities to be carried out under ESC is incorporated in Chapter – 8 of EIA report.*

The key demographics of the study area comprising 50 villages/towns are presented in **ANNEXURE # 5.**

# CHAPTER – 4

## ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES



### 4.1 INTRODUCTION

Impact prediction is a very important phenomenon in evaluating the environmentally potential adverse impacts for any proposed industrial project. The impact prediction is always carried out under worst possible conditions so as to mitigate or to eliminate the environmental hazards. These predictions are superimposed over the baseline data to calculate the net impact on the environment after the proposed plant comes into production.

### 4.2 AIR ENVIRONMENT

It is possible that increase in the background concentration of even a minor constituent of the atmosphere may lead to significant changes in the atmospheric properties. So these changes are essential in understanding potential climatic changes due to air pollutants. For example under strongly stable conditions, disturbances are highly damped and mixing of pollutants is strongly suppressed. It is under such conditions that the worst air pollution episodes have occurred. Several scientific techniques and methodologies are available to predict impacts of developmental activities on physico, ecological and socioeconomic environments. Such predictions are superimposed over the baseline (pre project) status of environmental quality to derive the ultimate (post project) scenario of environmental conditions. The prediction of impacts helps to identify the environmental management plan required to be executed during and after commissioning of the proposed plant to minimize the adverse impacts on environmental quality.

The mathematical models are the best tools to quantitatively describe cause-effect relationships between sources of pollution and different components of environment. In case, mathematical models are not available or it is not possible to identify / validate

through models for particular situation, prediction could be arrived at through available scientific knowledge and judgments.

The mathematical model used for predictions in the present study include, steady state Gaussian Plume dispersion model designed for multiple point sources for air quality, Wave divergence and Federal Highway Administration (FHWA) models for noise levels. In case of water, land, biological and socio-economic environments the prediction have been made based on available scientific knowledge and judgments.

#### **4.2.1 IMPACT ON TOPOGRAPHY AND CLIMATE**

##### **4.2.1.1 IMPACT ON TOPOGRAPHY**

The major envisaged topographical changes would be limited to the immediate vicinity of the plant. The change in topography will be only due to man made structures like Industrial complex and Administrative building. Similarly, it will invite positive benefits in the form of land leveling and green belt development in the plant vicinity.

##### **4.2.1.2 IMPACTS ON CLIMATE**

As the temperature of the effluent gases will not be high, generally this will not cause any thermal imbalance as extensive greenbelt will be developed within the plant premises. However, there will be natural dispersion of heat due to unstable conditions during day and as such there would be no significant micro / macro climatologically changes of any consequence.

#### **4.2.2 PREDICTION OF IMPACTS ON AIR ENVIRONMENT [Gen.TOR # 6 (i) & 7(i)]**

It is absolutely essential to study the impacts of air pollution on its environs due to the proposed project. These impacts are assessed with the help of Mathematical model based on steady state Gaussian Plume Dispersion Model designed for multiple point sources for short term. In the present case, Industrial Source Complex Short Term (ISCST-3), 1993 dispersion model based on steady state Gaussian plume dispersion, designed for multiple point sources for short term developed by United States Environment Protection Agency (USEPA) has been used for simulations from point sources.

**Model Input**

**Emissions**

The emission data from the stacks is shown in Table 4.1.1

**Receptor Locations**

The software is capable of generating a polar receptor grid at every 10 radial angles at specified distances (in Kms).

**Meteorological data**

For the prediction of rise in Ground Level concentrations of pollutants, the actual hourly meteorological data recorded at the site during the study period (**March 2017 to May 2017**) is converted to mean meteorological hourly data as specified by CPCB and the same is used in the model. In the absence of site specific mixing heights, mixing heights published in ‘Spatial distribution of hourly mixing depths over Indian region’ by Dr. R.N.Gupta have been used.

**Presentation of results**

In the present case model simulations have been carried out for the Post monsoon season. For the short term simulations, the concentrations have been estimated around 1600 receptors to obtain optimum description of variations in concentrations over the site in 10 Km. radius covering 16 directions.

**Model Output**

The output contains the first through sixth highest concentration values at each receptor, Maximum concentration tables and daily concentration tables for each averaging period.

**Prediction of Impacts & Mitigation Measures**

<b>IMPACT ENVIRONMENT</b>	<b>IDENTIFIED IMPACTS</b>	<b>MITIGATION MEASURES</b>
Air Environment	<b>Particulate emissions</b>	
	<ul style="list-style-type: none"> <li>• Coal transportation</li> <li>• Unloading of coal</li> </ul>	<ul style="list-style-type: none"> <li>• Covered trucks</li> <li>• Dust suppression system (fog type and water spray system)</li> </ul>
	<ul style="list-style-type: none"> <li>• Coal Handling Plant</li> </ul>	<ul style="list-style-type: none"> <li>• Dust extraction system with bagfilters</li> </ul>
	<ul style="list-style-type: none"> <li>• Coal transfer points</li> </ul>	<ul style="list-style-type: none"> <li>• Dust extraction system with bagfilters</li> </ul>

IMPACT ENVIRONMENT	IDENTIFIED IMPACTS	MITIGATION MEASURES
	<ul style="list-style-type: none"> <li>Coal conveying</li> </ul>	<ul style="list-style-type: none"> <li>Covered conveyers to prevent flying of dust during conveying</li> </ul>
	<ul style="list-style-type: none"> <li>Stacks attached to the DRI Kiln, FBC Boiler</li> </ul>	<ul style="list-style-type: none"> <li>Electro Static Precipitator (ESP) will be provided to bring down the PM to 50 mg/Nm<sup>3</sup> for DRI plant and 30 mg/Nm<sup>3</sup> for Power plant.</li> </ul>
	<ul style="list-style-type: none"> <li>Ash handling &amp; storage</li> </ul>	<ul style="list-style-type: none"> <li>Fly ash will be stored in silos only.</li> </ul>
	<ul style="list-style-type: none"> <li>Vehicular movement</li> </ul>	<ul style="list-style-type: none"> <li>All internal roads will be made pucca.</li> <li>Avenue plantation will be developed on both sides of village roads and internal roads.</li> </ul>
	<ul style="list-style-type: none"> <li>Sulphur dioxide emissions</li> </ul>	<ul style="list-style-type: none"> <li>Limestone to be used as Raw material in DRI kiln to act as sulphur absorbent.</li> <li>Lime dosing will be provided to treat the flue gases from the Power Plant to bring down the SO<sub>2</sub> emissions to below 100 mg/Nm<sup>3</sup> as per MoEF&amp;CC emission standards applicable from 1<sup>st</sup> January 2017.</li> <li>A flue gas velocity of 15 m/s will be maintained for effective dispersion of emissions.</li> </ul>
	<ul style="list-style-type: none"> <li>NOx emissions</li> </ul>	<ul style="list-style-type: none"> <li>NOx emissions from the Power Plant will be brought down to below 100 mg/Nm<sup>3</sup> as per MoEF&amp;CC emission standards applicable from 1<sup>st</sup> January 2017.</li> </ul>

#### 4.2.3 STACK HEIGHT CALCULATION

##### a) For Sponge Iron (for 4 x 100 TPD DRI Kiln attached to WHRB)

##### With Indian Coal

No. of Kilns	:	4 x 100 TPD
Coal consumption for 2 x 100 TPD Kilns	:	260 TPD
Max. Sulphur content in coal	:	1.0 % (by mass max.)
Total Sulphur dioxide Emission	:	260 x 1000 x 1.0 x 2 / 24 x 100
	:	216.67 kg / hour
Stack height H	:	14 (Q) <sup>0.3</sup>
	:	14 (216.67) <sup>0.3</sup>
	:	<b>70.29 SAY 71 m</b>

**With Imported Coal**

Coal consumption for 2 x 100 TPD Kilns	:	185 TPD
Max. Sulphur content in coal	:	1.0 % (by mass max.)
Total Sulphur dioxide Emission	:	185 x 1000 x 1.0 x 2 / 24 x 100
	:	154.17kg / hour
Stack height H	:	14 (Q) <sup>0.3</sup>
	:	14 (154.17) <sup>0.3</sup>
	:	<b>63.46 m SAY 64 m</b>

**2 no. of combined stacks each of 71 m will be provided to each 2 x 100 TPD DRI Kilns for effective dispersion of emission into the atmosphere.**

**b) For Induction Furnace**

3 no. of stacks each of 30 m height (minimum as per CPCB norms) for effective dispersion of emissions from 3 x 15 T Induction Furnaces.

**c) For Rolling Mill (With 2 alternate fuels)**

It is proposed to use Producer gas / Furnace Oil as fuels for Reheating Furnace.

**i. With Coal as fuel in Gasifier**

**1) With Indian Coal**

Coal consumption	:	15 TPD
Sulphur content in Coal	:	1.0 %
SO <sub>2</sub> emission	:	15 x 1000 x 1.0 x 2 / 2400
	:	12.50 Kg/hr
Stack Height H,	:	14 (Q) <sup>0.3</sup>
	:	14 (12.50) <sup>0.3</sup>
	:	<b>29.87 m SAY 30 m</b>

**2) With Imported Coal**

Coal consumption	:	11 TPD
Sulphur content in Coal	:	1.0 %
SO <sub>2</sub> emission	:	11 x 1000 x 1.0 x 2 / 2400

	:	9.17 Kg/hr
Stack Height H,	:	$14 (Q)^{0.3}$
	:	$14 (9.17)^{0.3}$
	:	<b>27.21 m SAY 28 m</b>
<i>ii. <u>With Furnace Oil as fuel</u></i>		
Furnace oil consumption	:	16.5 TPD
Sulphur content furnace oil	:	4.0 %
SO <sub>2</sub> emission	:	$16.5 \times 1000 \times 4.0 \times 2 / 2400$
	:	55 Kg/hr
Stack Height H,	:	$14 (Q)^{0.3}$
	:	$14 (55)^{0.3}$
	:	<b>46.58 SAY 47 m</b>

Hence a stack height of 47 m will be provided to 1 x 300 TPD Rolling mill unit considering worst scenario for effective dispersion of SO<sub>2</sub> emission into the atmosphere.

d) For 8 MW Power Plant (through FBC boiler - 40 TPH)

Entire dolochar generated from the plant i.e. 120 TPD will be used as fuel in FBC boiler. The following will be the fuel requirement which represents the worst environmental scenario.

i. With Indian Coal

Consumption of coal	:	168 TPD
Sulphur content in coal	:	1.0 % (by mass, Max.)
SO <sub>2</sub> emission	:	$168 \times 1000 \times 1.0 \times 2 / 24 \times 100$
	:	140.0 Kg/hr
Stack Height, H	:	$14(Q)^{0.3}$
	:	$14 (140)^{0.3}$
	:	<b>61.65 m SAY 62 m</b>

ii. With Imported Coal

Consumption of coal	:	120 TPD
Sulphur content in coal	:	1.0 % (by mass, Max.)

SO <sub>2</sub> emission	:	120 x 1000 x 1.0 x 2 / 24 x 100
	:	100.0 Kg/hr
Stack Height, H	:	14(Q) <sup>0.3</sup>
	:	14 (100) <sup>0.3</sup>
	:	55.74 m say 56 m

**Hence a stack of 62 m height will be provided to the FBC boiler for effective dispersion of emissions into the atmosphere.**

The emission from Producer gas plant will be treated in Cyclone separator to remove dust particles and Electric detarrer to separate the tar.

The predicted max. Incremental PM<sub>10</sub> concentrations (24 hourly) due to the emissions from operation of proposed project will be **2.3 µg/m<sup>3</sup>** at a distance of 900 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in PM concentration due to the Vehicular emission will be **0.9 µg/m<sup>3</sup>**.

Hence the total predicted incremental rise due to the emissions from operation of proposed project and due the vehicular emission will be **2.3 µg/m<sup>3</sup> + 0.9 µg/m<sup>3</sup> = 3.2 µg/m<sup>3</sup>**.

The predicted max incremental SO<sub>2</sub> concentrations (24 hourly) due to the emissions from operation of proposed project will be **18.2 µg/m<sup>3</sup>** at a distance of 900 m from the stack in the down wind direction over the baseline concentrations.

The predicted max incremental NOx concentrations (24 hourly) due to the emissions from operation of proposed project will be **5.2 µg/m<sup>3</sup>** at a distance of 900 m from the stack in the down wind direction over the baseline concentrations.

The predicted incremental rise in NOx concentration due to the Vehicular emission will be **5.9 µg/m<sup>3</sup>**.

Hence the total predicted incremental rise due to the emissions from operation of proposed project and due the vehicular emission will be **5.2 µg/m<sup>3</sup> + 5.9 µg/m<sup>3</sup> = 11.1 µg/m<sup>3</sup>**

The predicted incremental rise in CO concentration due to the Vehicular emission will be **2.3 µg/m<sup>3</sup>**.

The net resultant concentrations (Maximum baseline conc. + predicted incremental rise in conc.) of PM, SO<sub>2</sub> and NO<sub>x</sub> shown in Table No. 4.1.2, by considering the emissions from other industries in the area will be well within the National Ambient Air Quality Standards (NAAQS) when the plant will commence the operation. Hence there will not be any adverse impact on air environment due to the proposed activities.

**TABLE 4.1.1**  
**STACK EMISSIONS [Gen.TOR # 3 (vi) & 7 (v)]**

S.No.	Stack attached to	Dia (m)	Height (m)	Temp. of flue gas (°C)	Velocity of flue gas (m/sec)	PM (g/s)	SO <sub>2</sub> (g/s)	NO <sub>x</sub> (g/s)
1.	DRI kiln with WHRB (2 x 100 TPD)	1.3	71 (combined stack)	170	15	0.9 (per flue)	30 (per flue)	1.8 (per flue)
2.	DRI kiln with WHRB (2 x 100 TPD)	1.3	71 (combined stack)	170	15	0.9 (per flue)	30 (per flue)	1.8 (per flue)
3.	Induction Furnace (3 x 15 T)	1.0	30 (3 nos.)	100	15	0.5 (per stack)	---	1.0 (per stack)
4.	Rolling Mill (1 x 300 TPD)	1.0	47	180	15	0.4	15.3	0.8
5.	AFBC Boiler * (40 TPH Boiler)	1.5	62	170	15	0.5	1.8	1.8

\* Emission calculation are based on emission standards notified by MoEF&CC vide S.O. no. 3305 (E) dated 7<sup>th</sup> December 2015

**TABLE 4.1.2**  
**NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO PROPOSED PROJECT & DUE TO OTHER**  
**INDUSTRIES IN THE AREA**

**(APCS WORKING SCENARIO) – March 2017 to May 2017)**

**[Gen.TOR # 7 (i)]**

Item	PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	CO (µg/m <sup>3</sup> )
Maximum baseline conc. in the study area	58.5	14.5	18.9	758
Maximum predicted incremental rise in concentration due to <b>VMEL</b>	2.3	18.2	5.2	--
Maximum predicted incremental rise in concentration due to <b>Vehicular Emissions from the proposed project</b>	0.9	--	5.9	2.3
<b>Net resultant concentrations during operation of the plant</b>	<b>61.7</b>	<b>32.7</b>	<b>30</b>	<b>760.3</b>
<b>National Ambient Air Quality Standards</b>	<b>100</b>	<b>80</b>	<b>80</b>	<b>2000</b>

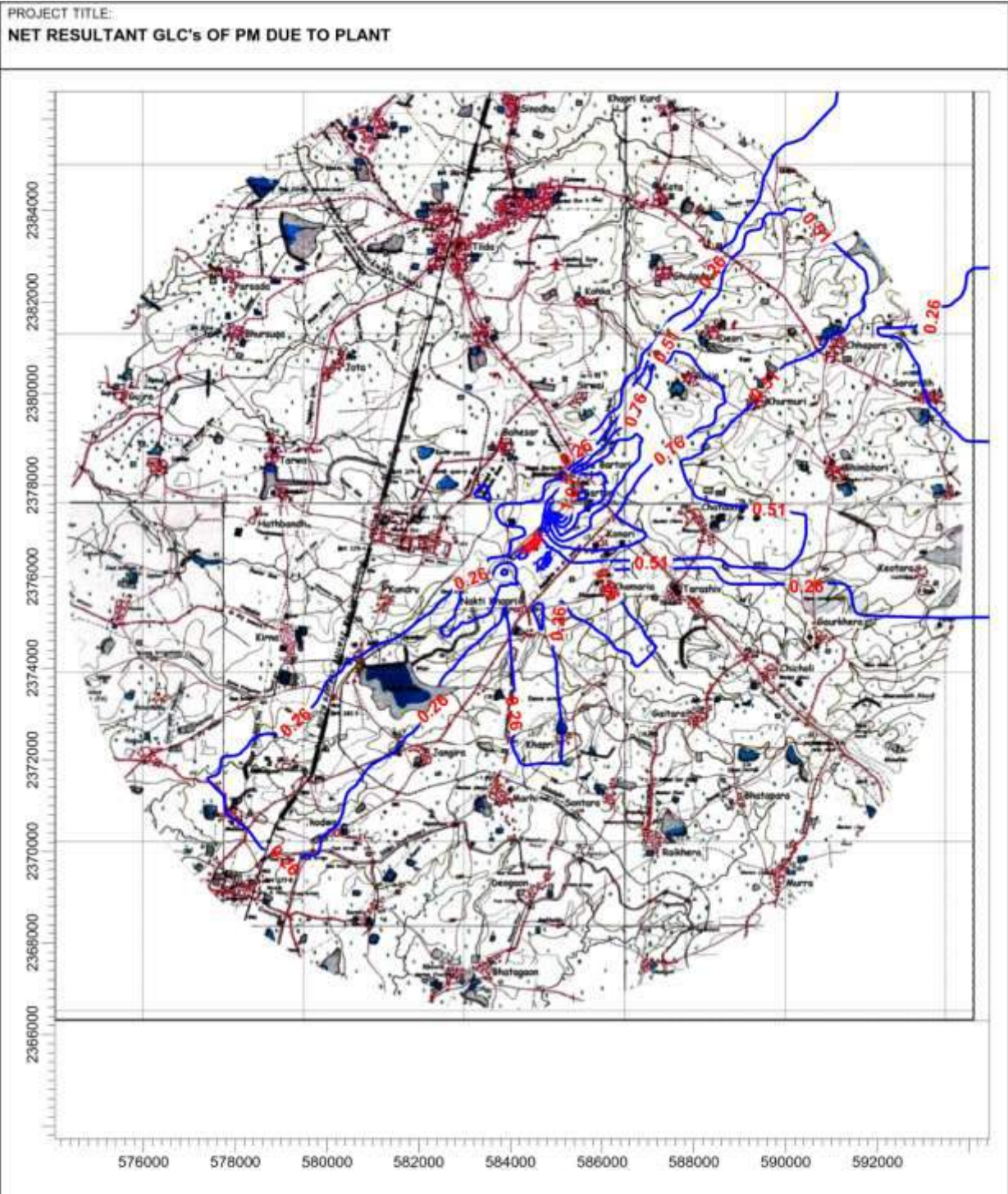
**TABLE 4.1.3**  
**NET RESULTANT MAXIMUM CONCENTRATIONS DUE TO PROPOSED PROJECT & DUE TO OTHER**  
**INDUSTRIES IN THE AREA**

**(APCS NOT WORKING SCENARIO) – March 2017 to May 2017)**

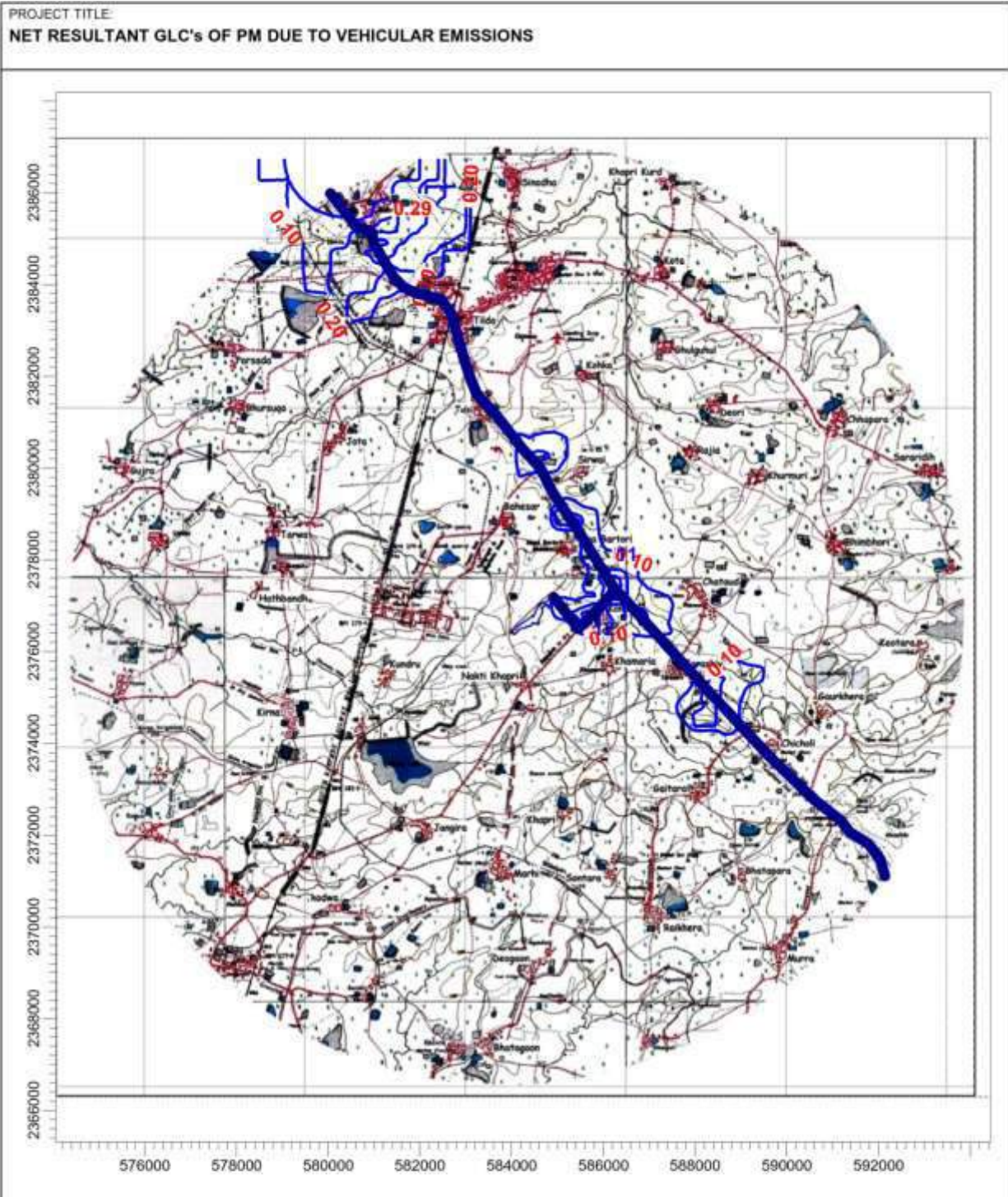
Item	PM <sub>10</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	CO (µg/m <sup>3</sup> )
Maximum baseline conc. in the study area	58.5	14.5	18.9	758
Maximum predicted incremental rise in concentration due to <b>VMEL</b>	918.7	18.2	5.2	--
Maximum predicted incremental rise in concentration due to <b>Vehicular Emissions from the proposed project</b>	0.9	--	5.9	2.3
<b>Net resultant concentrations during operation of the plant</b>	<b>978.1</b>	<b>32.7</b>	<b>30</b>	<b>760.3</b>
<b>National Ambient Air Quality Standards</b>	<b>100</b>	<b>80</b>	<b>80</b>	<b>2000</b>

The net resultant Ground level concentrations during operation of the project when APCS is not working is exceeding the NAAQS. However interlocking system will be provided and whenever APCS is not working, then raw material feed will be stopped. Consequently there will be no production in the unit till APCS is rectified.

**Air Modelling Isoleths**

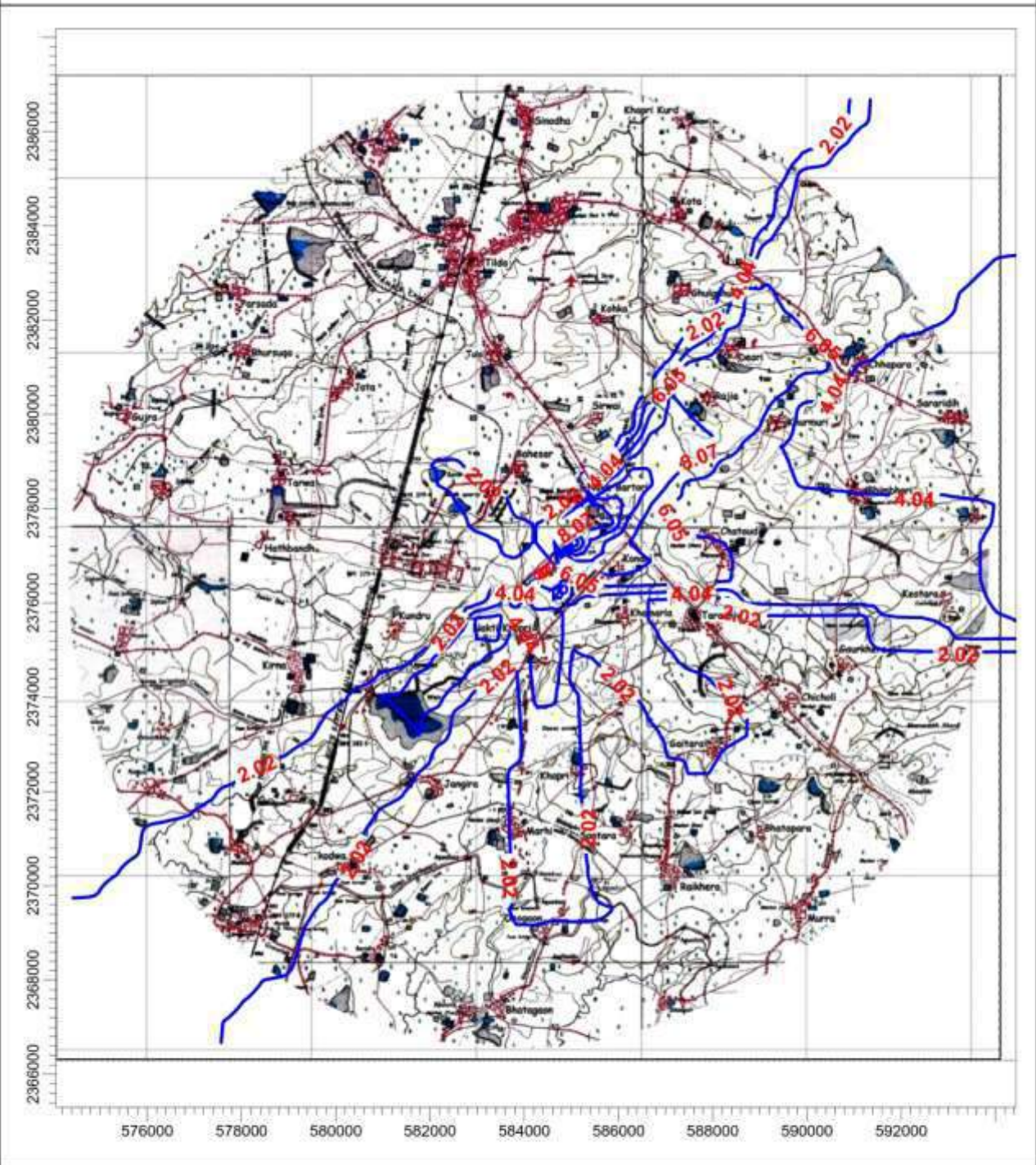



SOURCES	<b>M/s VIKAS METALIKS &amp; ENERGY LIMITED</b>	
RECEPTORS	<b>1600</b>	
Concentration	SCALE:	1:115,000
MAX:	0  4 km	
	<b>2.25537 ug/m<sup>3</sup></b>	



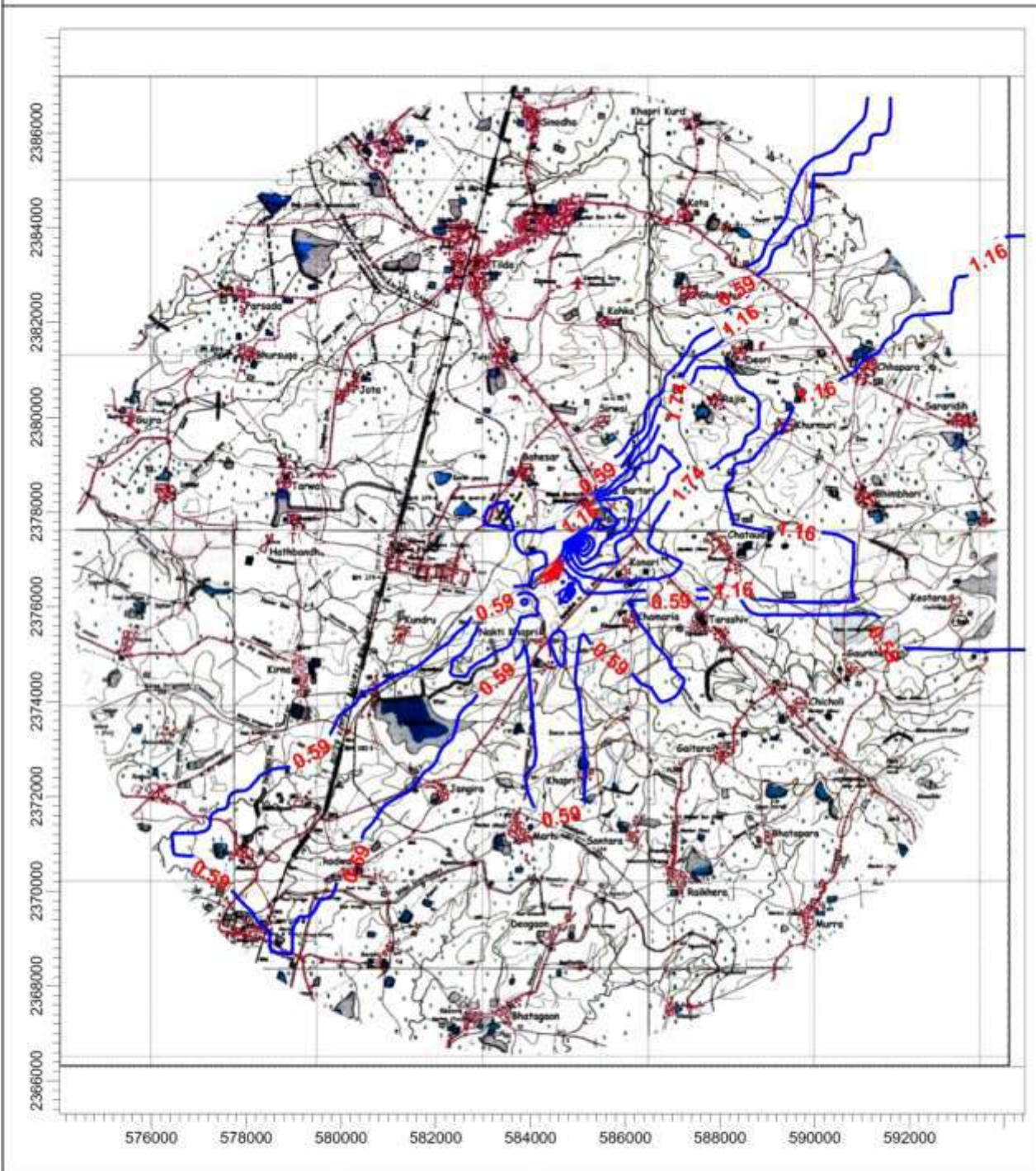
SOURCES	M/s VIKAS METALIKS & ENERGY LIMITED	
2		
RECEPTORS		
1600		
Concentration	SCALE: 1:115,000	
	0 4 km	
MAX:		
0.87178 ug/m <sup>3</sup>		


PROJECT TITLE:  
**NET RESULTANT GLC's OF SO<sub>2</sub> DUE TO PLANT**



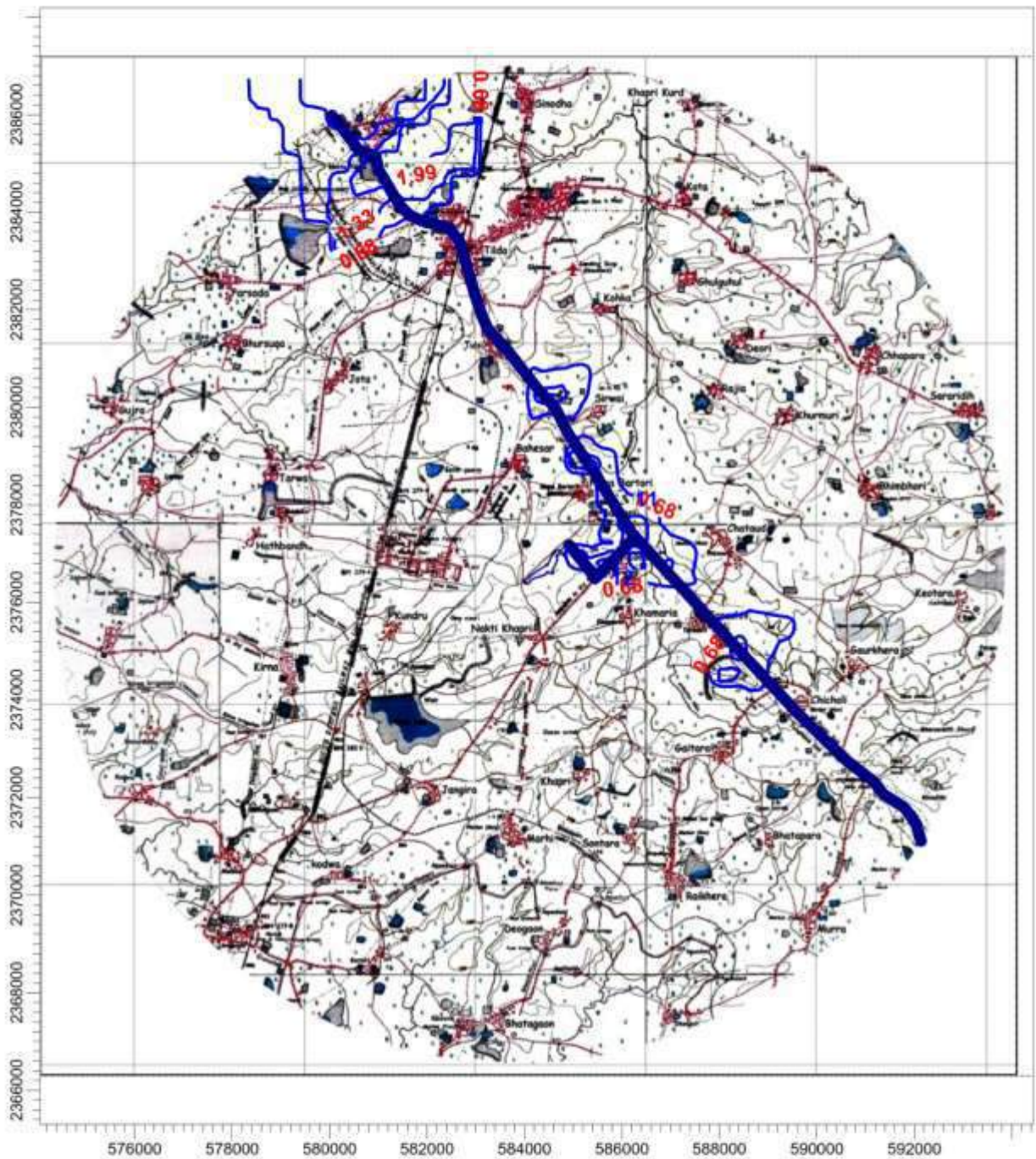
SOURCES	M/s VIKAS METALIKS & ENERGY LIMITED	
4		
RECEPTORS		
1600		
Concentration	SCALE: 1:115,000	
	0  4 km	
MAX:		
18,15707 ug/m <sup>3</sup>		


PROJECT TITLE:  
**NET RESULTANT GLC's OF NO<sub>x</sub> DUE TO PLANT**



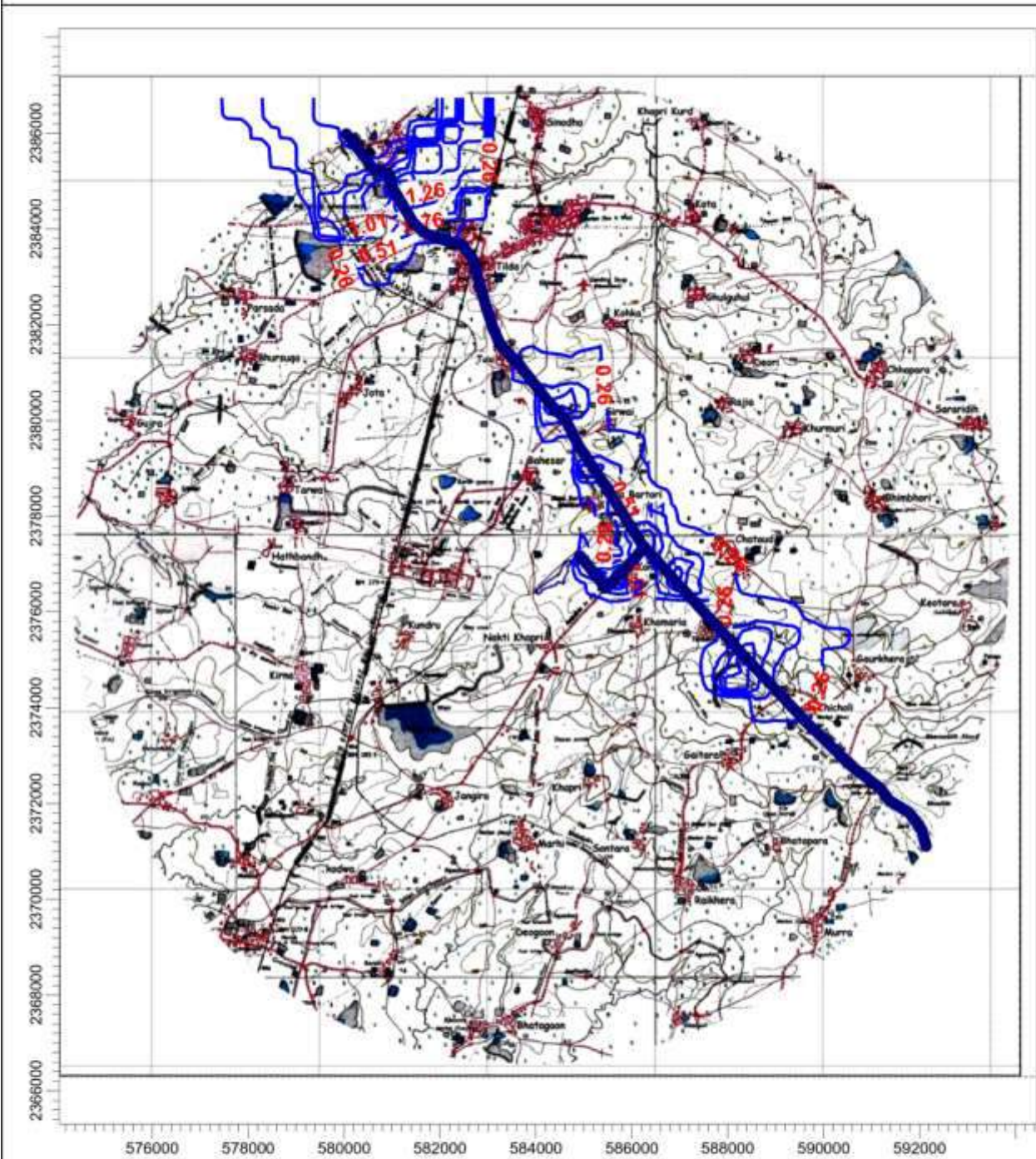
SOURCES	7		M/s VIKAS METALIKS & ENERGY LIMITED
RECEPTORS	1600		
Concentration	SCALE: 1:115,000		0  4 km
MAX:	5.16819 ug/m <sup>3</sup>		


PROJECT TITLE:  
**NET RESULTANT GLC's OF NO<sub>x</sub> DUE TO VEHICULAR EMISSIONS**



SOURCES	M/s VIKAS METALIKS & ENERGY LIMITED	
2		
RECEPTORS		
1600		
Concentration	SCALE: 1:115,000	
	0  4 km	
MAX:		
5.91876 ug/m <sup>3</sup>		

PROJECT TITLE:  
 NET RESULTANT GLC'S OF CO DUE TO VEHICULAR EMISSIONS



SOURCES	M/s VIKAS METALIKS & ENERGY LIMITED	
2		
RECEPTORS		
1600		
Concentration	SCALE:	1:115,000
	0  4 km	
MAX:		
2.26468 ug/m <sup>3</sup>		

**4.3 PREDICTION OF IMPACTS ON WATER ENVIRONMENT**

**4.3.1 WATER REQUIREMENT [Gen.TOR # 3(vii)]**

The water requirement for the proposed project will be **450 KLD**. This includes Make-up water for DRI Kiln, Induction Furnace, Rolling Mill, Power Plant. Air cooled condensers will be provided in Captive power plant. Hence the net water requirement will be substantially reduced.

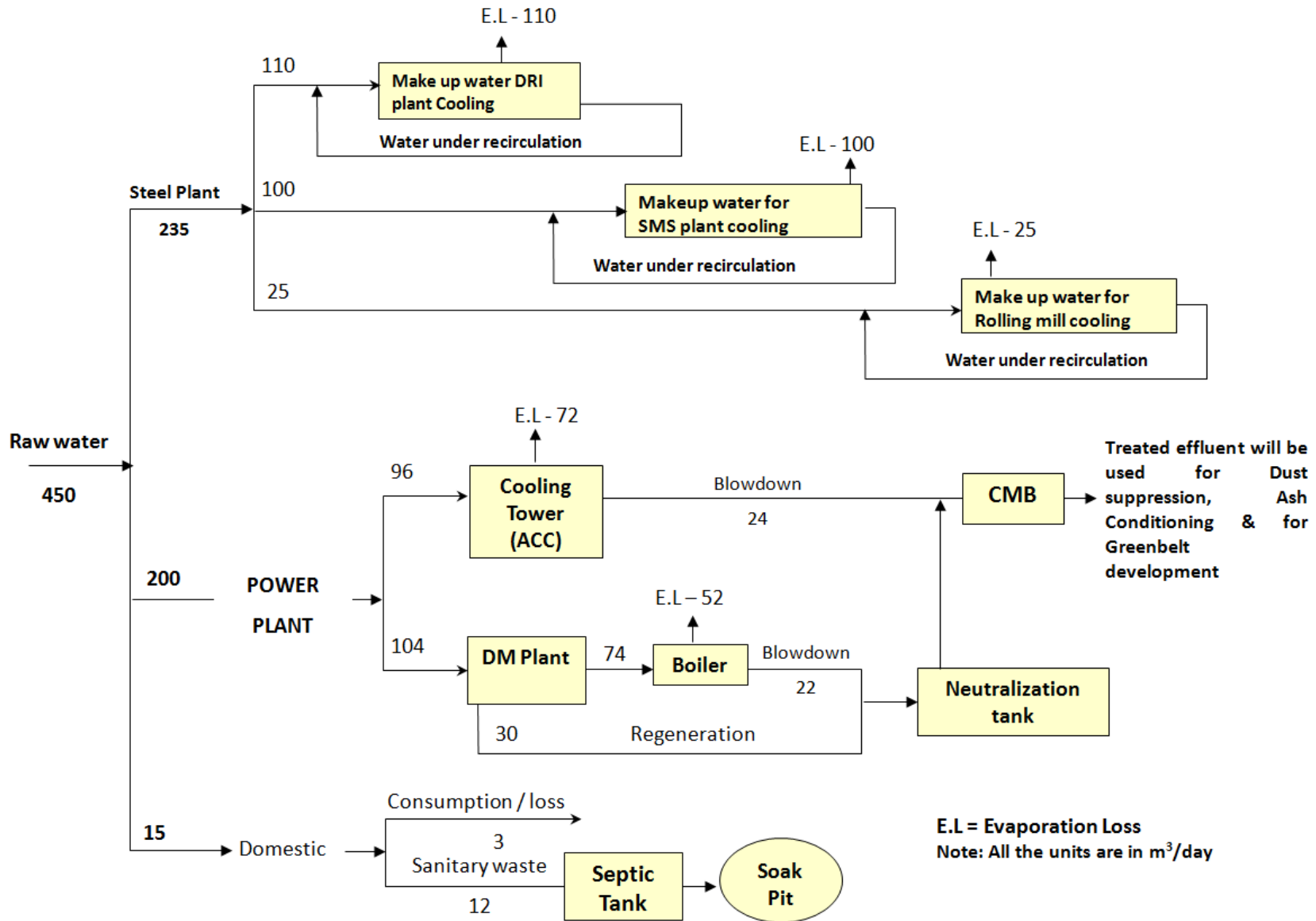
Water required for the proposed project will be sourced from Ground Water. Ground Water drawl permission from CGWA has been obtained NOC no. CGWA/NOC/IND/ORIG/2018/3370. Letter is yet to be issued. Kindly refer to Annexure – 9 for screenshot from the CGWA website showing Approval of NOC for drawl of ground water.

The details of total water consumption, it's breakup and total waste water generation and it's breakup are shown in Table 4.2.1. & 4.2.2. Characteristics of waste water are shown in Tables 4.2.3. Rain water harvesting pits have been proposed to recharge the precious ground water in consultation with Ground Water Board. The depth of ground water table will certainly increase Rain water harvesting measures. Hence there will not be any adverse impact on water environment due to the proposed project.

**TABLE 4.2.1**  
**WATER REQUIREMENT**

S.No.	Water requirement	Quantity (KLD)
1.	DRI kiln	110
2.	Steel melting shop	100
3.	Rolling mill	25
4.	Power Plant (16 MW)	
	• Cooling tower makeup	96
	• Boiler make up	74
	• DM plant Regeneration	30
5.	Domestic	15
	<b>Total</b>	<b>450</b>

**WATER BALANCE DIAGRAM**



**4.3.2 WASTEWATER GENERATION**

There will be not ne any effluent generation in the DRI plant, Induction Furnace & Rolling mill as closed circuit cooling system will be adopted. Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench. The following will be the total wastewater & it’s break-up.

**TABLE 4.2.2**  
**WASTEWATER BREAKUP**

S.No.	Source	Generation (KLD)
1.	Power Plant	
	a) Cooling Tower blowdown	24
	b) Boilers blowdown	22
	c) D.M. plant regeneration water	30
2.	Sanitary Wastewater	12
	<b>Total</b>	<b>88</b>

**TABLE 4.2.3**  
**CHARACTERISTICS OF EFFLUENT**

PARAMETER	CONCENTRATION		
	R O Rejects	DM Plant Regeneration	Sanitary waste water
pH	7.5 – 8.0	5.0 – 10.0	7.0 – 8.5
BOD (mg/l)	--	--	200 – 250
COD (mg/l)	--	--	300 – 400
TDS (mg/l)	600	5000 – 6000	800 – 900
Oil & Grease (mg/l)	--	10	--
SS (mg/l)	350	--	--

**4.3.3 IMPACT ON SURFACE WATER BODIES**

- There are no major Rivers are flowing within 10 Km. radius of the proposed project site. However, few ponds & tanks exists within 10 Km. radius of the project site.
- Water required for the proposed project will be sourced from Ground water source.
- There will be no effluent generation in the DRI Kiln, Induction Furnace, Rolling Mill, as closed circuit cooling system will be adopted.
- Air cooled condensers will be provided in power plant.

- Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Garland drains will be constructed around the storage yards to prevent any run off from the storage yards entering into the water bodies.
- Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench.
- Zero effluent discharge will be maintained.
- Rain water harvesting pits have been proposed to recharge the precious ground water in consultation with SGWB.
- The depth of ground water table will certainly increase due to Rain water harvesting measures.

Hence there will not be any impact on surrounding water bodies due to the proposed project.

#### **4.4 PREDICTION OF IMPACTS DUE TO NOISE**

##### **4.4.1 PREDICTION OF IMPACT DUE TO THE PROPOSED ACTIVITY**

The sound pressure level generated by noise source decreases with increasing distance from the source due to wave divergence.

An additional decrease in sound pressure level with distance from the source is expected, due to atmospheric effect or its interaction with objects in the path of transmission. For hemispherical sound wave propagation through homogeneous loss free medium, one can estimate noise levels at various locations, due to different sources using model based on first principle, as per the following equation:

$$Lp_2 = Lp_1 - 20 \text{ Log } (r_2/r_1) - Ae_{1.2}$$

Where  $Lp_1$  and  $Lp_2$  are sound pressure levels at points located at distance  $r_1$  and  $r_2$  from the source and  $Ae_{1.2}$  is the excess attenuation due to environmental conditions. Combined affect of all the sources then can be determined at various locations by logarithmic addition. In first approximation one can assume that for all general population in the villages, every noise source in the plane is a point source. The average equivalent sound power level of such

a point source can be estimated for different distances and directions from hypothetical source by applying following equation:

$$L_p = L_w - 20 \log r - A_e - 8$$

Where  $L_w$  is the sound power level of the source,  $L_p$  is sound pressure level at a distance  $r$  and  $A_e$  is environmental attenuation factor. A combined noise level  $L_p$  (total) of all the sources at a particular place is given by:

$$L_p \text{ (total)} = 10 \log (10^{L_{p1}/10} + 10^{L_{p2}/10} + \dots)$$

Major noise generating sources were identified from the proposed activity for prediction purposes. The major noise generating sources are Turbine, Boiler, Compressors, DG set. The predictions have been made to represent the worst case. The noise levels at various distances were calculated using wave divergence model. The model was run for ascertaining the areas where we could get the noise levels of 35, 45, 50, 55, 60, 65 and considering the other noise generating sources from the plant.

Acoustic enclosures will be provided to turbines. Silencers will be provided to the DG Set. All machinery will be manufactured keeping in view of the MOEF/OSHA standards on Noise levels. The Ambient Noise levels will be within the standards prescribed by MOE&F, GOI vide Notification dated 14-02-2000 under the Noise pollution (regulation & control) Rules, 2000 i.e. ambient noise levels will be less than 75 dBA during day time & less than 70 dBA during night time.

#### **4.4.2 PREDICTION OF IMPACTS ON COMMUNITY**

Day and Night sound pressure levels,  $L_{dn}$  are often used to describe the community noise exposure which includes 10 dBA night time penalties. As the nearest human settlement is 0.4 Kms. from the site, the impact of noise on general population would be insignificant.

As per the WHO recommendation, there is no identified risk and damage of hearing due to the noise levels ( $L_{eq} = 8$  hours) less than 75 dBA. Most of the international damage risk criteria for hearing loss permit ( $L_{eq} = 12$  hours) upto 87 dBA. Further, WHO recommendation on community noise annoyance, permits day time out door noise levels of 55 dBA.

#### **4.4.3 PREDICTION OF IMPACT ON OCCUPATIONAL HEALTH**

The damage risk criteria as enforced by OSHA (Occupation Safety and Health Administration) to reduce hearing loss, stipulates that noise level upto 85 dBA are acceptable for 8 hour working shift per day. Plant authorities will provide ear plugs to the employees and will be enforced to be used by the employees.

#### **4.5 PREDICTION OF IMPACTS ON LAND ENVIRONMENT**

Total land envisaged for the entire project is 34.26 acres / 13.86 Ha.

As there are no endangered species in the vicinity of the proposed activity, there will not be any concern for the loss of important germoplasm that needs conservation.

To control the fugitive emissions dust extraction system and dust suppression system will be installed at all the dust emanating areas. All required pollution control systems will be installed and operated to comply with the norms. Hence there will not be any impact on nearby top soil.

Proposed plant will maintain Zero effluent discharge and closed circuit cooling system will be implemented. Hence there will not be any adverse impact on water environment.

Solid waste generated from the plant will be disposed /utilized as per the norms. Hence there will not be any adverse impact on land environment due to the proposed plant. The land use pattern of the study area will certainly be improved due to the proposed activity. Land price in the nearby area will increase which will benefit the local people. This industry may attract some ancillary works also which will also help in improving the land use pattern of the area. Greenbelt is considered essential for maintaining the stability of the environment of the area. 11.3 Acres of extensive greenbelt will be developed in the plant premises.

#### **4.6 PREDICTION OF IMPACTS DUE TO VEHICULAR MOVEMENT**

##### **[Gen. TOR # 6 (ix) & 7 (iii)]**

Raw materials, Products & Wastes will be transported in covered trucks by road. Avenue plantation will be developed on both sides of village road leading to the plant site.

- Major raw materials will be transported through railway rakes up to the nearest railway station and then to the site through road by covered trucks.

- All the trucks used for the transport of raw materials, products and wastes will be “Environmentally compliant”.
- Internal roads will be made pucca.
- All the raw material required for the proposed steel plant will be stored on pucca platform above ground level.
- All the raw material yards are equipped with water sprinkling system so as to avoid fugitive emission during the material handling.
- The proposed site is well connected by Pucca road which is capable of absorbing additional truck movement due to transportation.

Hence there will not be much fugitive dust generation during transportation of raw materials, products & Solid wastes.

Total no. of trucks during the operation of the proposed project = **152 trucks/day**.

The following table shows the baseline traffic, additional traffic due to the proposed project:

**Traffic Study**

Name of Project : Vikas Metaliks & Energy Limited

Location of the Project : Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh

Type of Vehicle	Existing Vehicular Traffic							Peak Traffic during operation of the proposed project							Carrying Capacity PCU (per day) as per IRC : 73-1980
	Tilda Simga Road			Tilda Simga Road			Total	Tilda Simga Road			Tilda Simga Road			Total	
	Actual Count (per Day)	As % of Total Vehicular Count	As PCU	Actual Count (per Day)	As % of Total Vehicular Count	As PCU		Actual Count (per Day)	As % of Total Vehicular Count	As PCU	Actual Count (per Day)	As % of Total Vehicular Count	As PCU		
Passenger car, Tempo, Auto rickshaw or Agricultural Tractor	240	9.8	240	300	13.1	300	540	10	4.7	10.0	10	4.7	10	20.0	10000 - (for 2 lane undivided)
Cycle, Motor Cycle or Scooter	1440	58.5	720	1140	49.7	570	1290	50	23.6	25.0	50	23.6	25	50.0	
Truck, Bus, or Agricultural Tractor Trailer unit	780	31.7	2340	852	37.2	2556	4896	152	71.7	456.0	152	71.7	456	912.0	
Bullock Cart	0	0.0	0	0	0.0	0	0	0	0.0	0.0	0	0.0	0	0.0	
<b>Total (daily basis)</b>	<b>2460</b>	<b>100.0</b>	<b>3300</b>	<b>2292</b>	<b>100</b>	<b>3426</b>	<b>6726</b>	<b>212</b>	<b>100</b>	<b>491.0</b>	<b>212</b>	<b>100</b>	<b>491</b>	<b>982.0</b>	

Total load on the road from Tilda Simga Road, during operation of the proposed project will be

Traffic load before operation of the Proposed project	:	6726.0	PCU/day
Additional traffic load during operation of the proposed project	:	982.0	PCU/day
<b>Total load</b>	<b>:</b>	<b>7708.0</b>	<b>PCU/day</b>
<b>Traffic Capacity as per IRC 73: 1980</b>	<b>:</b>	<b>10000.0</b>	<b>PCU/day</b>

Hence there will not be any impact on the traffic load due to the proposed project

#### 4.7 PREDICTION OF IMPACTS ON FLORA & FAUNA

- There are no National Parks, Wild life Sanctuaries and Bird Sanctuaries within 10 Km. radius of the project site.
- Bilari R.F. is present at a distance of 9.8 Kms. from the project site.
- No Rare and Endangered species are present within the study area.
- All the required Air emissions control systems will be installed and operated to comply with MOEF/CPCB/SPCB norms.
- Interlocking systems will be provided to ESPs in such a way that whenever ESP fails, the raw material feed to the kiln/boiler will stop. Hence there will be no production till the ESP is rectified.
- Zero liquid effluent discharge will be maintained in the proposed project.
- All solid waste disposal will be in accordance with the norms.
- Greenbelt of 11.3 acres will be developed in the plant premises.

All norms will be complied, there will not be any adverse impact on Flora & Fauna due to the proposed project.

**4.8 PREDICTION OF IMPACTS ON SOCIO ECONOMIC ENVIRONMENT**

Socio-economic impacts of proposed project are predicted as follows:

S.No.	Impact Parameter	Predicted Impacts		Budget Allocation / Remark
		Positive	Negative	
1	Human Settlement	<ul style="list-style-type: none"> <li>No displacement of people or habitations would occur.</li> </ul>	Nil	----
2	Livelihoods	<ul style="list-style-type: none"> <li>No loss of existing livelihoods. Direct or indirect is expected to occur.</li> <li>Additional non agricultural livelihood opportunities are expected both directly and as spinoffs.</li> </ul>	A moderate influx of people in project construction and operation phases.	Priority will be given local people in employment
3	Employment Generation	<ul style="list-style-type: none"> <li>No loss of existing employment due to the proposed project is expected.</li> <li>Creation of additional employment for about 200 skilled, semi-skilled &amp; unskilled workers during project operation.</li> <li>Indirect employment to about 500 persons as a sequel to income multiplie effect and induced growth during construction &amp; operation phases of the project.</li> <li>Majority of them will be local women and youth.</li> </ul>	Nil	----
4	Incomes and Revenues	<ul style="list-style-type: none"> <li>Improvement of money incomes of locals engaged in tertiary businesses by an average 10 % through induced spending.</li> <li>Improved tax revenues of Gram Panchayat.</li> <li>The successful commissioning and running of the proposed plant will attract more industrial investments which in turn will benefit the society and the nation.</li> </ul>	Nil	----

5	Demographics	<ul style="list-style-type: none"> <li>The population levels of the neighbouring villages are not likely to change in any significant manner.</li> <li>The lifestyles of people are expected to improve in tune with the rise in incomes and improvement in infrastructure facilities.</li> <li>The skill sets of the local residents are expected to improve in keeping with the emerging employment opportunities.</li> </ul>	Nil	---
6	Community Health	<ul style="list-style-type: none"> <li>Health of people residing in all the three impact zones is not likely to be impacted adversely considering the nature of emissions and the state of the art air pollution control systems planned.</li> </ul>	<ul style="list-style-type: none"> <li>If effective systems are not adopted for fly ash disposal, it may raise community health issues.</li> </ul>	<ul style="list-style-type: none"> <li>Budget of Rs. 3.0 Crores has been earmarked for solid waste management, which includes silo, for storage of fly ash.</li> </ul>
7	Physical Infrastructure	<ul style="list-style-type: none"> <li>Road and power network in the area is expected to be strengthened as a sequel to industrial development around.</li> </ul>	<ul style="list-style-type: none"> <li>If major Increase in vehicular traffic may lead to higher incidence of road accidents.</li> </ul>	---
8	Social Infrastructure	<ul style="list-style-type: none"> <li>Improvement in housing stock and educational facilities could be expected in the long run as industrialization in the area gains acceleration.</li> </ul>	<ul style="list-style-type: none"> <li>Increased pressure on residential accommodation, water supply and sanitation in the neighborhood during construction phase due to influx of workers.</li> </ul>	---

# CHAPTER – 5

## ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)



### 5.1 ALTERNATIVE TECHNOLOGIES

No technological failures are anticipated, as DRI Kiln, Tunnel Kiln, Induction Furnace, Rolling Mill and Power Generation are well known and proven technologies all over the world. Hence no alternative technologies are considered.

### 5.2 ALTERNATIVE SITES **[Gen.TOR # 4 (i)]**

Vikas Metaliks & Energy Limited have proposed to setup the plant at Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh and obtained Environmental Clearance vide letter no. J-11011/80/2008 – IA II (I) dated 9<sup>th</sup> June 2009.

Now, as per the EIA notification 2006 and its amendments, the validity period of Environmental Clearance issued vide letter no. J-11011/80/2008 – IA II (I) dated 9<sup>th</sup> June 2009 has been expired as on 8<sup>th</sup> June 2016. In view of the same, now the management has applied for issue of NEW Environmental Clearance.

The total land has been reduced from 100 Acres to 34.26 Acres / 13.86 Ha. As the management has proposed to drop few units from earlier accorded Environment Clearance. Hence no alternative site has been examined.

Now it has been Proposed to install Sponge Iron Plant of 1,20,000 TPA (Reducing from 2,55,000 TPA to 1,20,000 TPA) capacity, Induction furnace with CCM & LRF of 1,35,000 TPA (Reducing from 1,80,000 TPA to 1,35,000 TPA) capacity, Rolling Mill of 90,000 TPA (no change) capacity, Power Plant through WHRB of 8 MW (reducing from 18 MW to 8 MW) capacity, Power Plant through FBC Boiler of 8 MW (Reducing from 15 MW to 8 MW) capacity & dropping of Pellet Plant, Blast Furnace, Ferro Alloy unit].



## CHAPTER – 6

# ENVIRONMENTAL MONITORING PROGRAM

### 6.1 TECHNICAL ASPECTS

#### 6.1.1 METHODOLOGY

To know the effectiveness of environmental mitigation measures post project environmental monitoring program will be strictly followed as per the statutory requirement.

- The flue gases from the DRI kilns will pass through Waste Heat Recovery Boiler and after heat recovery the gases will be treated in High efficiency ESP and then discharged into the atmosphere through **2 no. of combined stacks** each of **71 m** height attached to **each 2 x 100 TPD kilns**, to bring down the particulate emission in the exhaust gases to below **50 mg/Nm<sup>3</sup>**.
- The Fugitive emissions from the Induction furnaces will be sucked through hoods and will pass through a fume extraction system with bag filters and then the treated gases will be discharged into the atmosphere through **3 no. of stacks each of 30 m height** for effective dispersion of emissions from Induction Furnaces. The outlet dust emission in the exhaust gases will be less than **50 mg/Nm<sup>3</sup>**. The dust will be pneumatically carried to covered bins.
- The flue gases will be discharged into the atmosphere through a stack of **47 m** height for effective dispersion of emissions from Induction Furnaces.
- The Exhaust emissions from FBC Boiler will pass through a high efficiency ESP to bring down the particulate matter to less than **30 mg/Nm<sup>3</sup>** and will be let out into the atmosphere through a stack of **62 m** height for effective dispersion of emissions into the atmosphere.
- Energy meters will be provided to all air pollution control systems to ensure effective operation of the control systems.
- Fugitive emissions will be monitored as per CPCB norms.
- All air emission control systems will be taken-up for maintenance as per prescribed schedule and compliance with norms will always be ensured.
- Stack monitoring and Ambient air quality checks at regular interval by SPCB will also help in cross checking the performance of Pollution control systems installed in the plant.

**6.1.2 FREQUENCY & LOCATIONS OF ENVIRONMENTAL MONITORING**

A comprehensive monitoring programme is given as under. This environmental monitoring will be entrusted to a third party.

**MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS**

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
<b>1. Water &amp; Waste water quality</b>				
A.	Water quality in the area	Once in a month except for heavy metals which will be monitored on quarterly basis.	Composite sampling (24 hourly)	As per IS: 10500
B.	Effluent at the outlet of the ETP	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules, 1996
C.	Sanitary waste water	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules 1996
<b>2. Air Quality</b>				
A.	Stack Monitoring	Online monitors (WHRB & FBC boiler stacks) Once in a month		PM  PM, SO <sub>2</sub> & NO <sub>x</sub>
B.	Ambient Air quality (CAAQMS)	Continuous	Continuous	PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> & NO <sub>x</sub>
C.	Fugitive emissions	Once in a Month	8 hours	PM
<b>3. Meteorological Data</b>				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
<b>4. Noise level monitoring</b>				
	Ambient Noise levels	Twice in a year	Continuous for 24 hours with 1 hour interval	Noise levels

**6.1.3 DATA ANALYSIS**

All the parameters will be analyzed as per IS procedures specified for those parameters. All water samples will be analyzed for various parameters as per IS: 10500 procedures.

The methodology adopted for monitoring & analysis of PM<sub>2.5</sub> & PM<sub>10</sub> is as per IS: 5182 Part IV, SO<sub>2</sub> & NO<sub>x</sub> as per IS: 5182 Part II & Part VI respectively. Samples were analyzed for SO<sub>2</sub> using improved West-Gaeke method for air samples using a spectrophotometer at a wavelength of

560nm. Samples were analyzed for NO<sub>x</sub> using Jacob and Hocheiser modified (Na-As) method, for Air samples using a spectrophotometer at wavelength of 540 nm.

PM<sub>10</sub> & PM<sub>2.5</sub> in ambient air are found by using Respirable Dust Sampler (RDS) & APM-550.

#### 6.1.4 REPORTING SCHEDULE

After completion of analysis, copies of all the analysis reports will be sent to Ministry of Environment, Forests & Climate Change and SPCB on monthly basis. Copies of the reports will be maintained in the plant and will be made available to the concerned inspecting authorities as and when required.

#### 6.1.5 EMERGENCY PROCEDURES

Whenever the ESP fails to comply with the norms, then interlocking system will immediately cut-off the supply of raw materials to the kiln. The kiln will be shut down as per the procedure to have least environmental impact.

#### 6.1.6 DETAILED BUDGET & PROCUREMENT SCHEDULES

The budgetary allocation for Environmental monitoring is **Rs. 14.1 Lakhs/Annum**. A third party will be engaged to monitor all the environmental parameters as per CPCB / SPCB norms once the proposed project comes into operation.

Following is the detailed break up of Budget allocation towards Environmental monitoring:

S.No.	Monitoring Item	No. of units Proposed	Monitoring Parameters	Frequency of Monitoring	No. of Samples /annum	Cost / Sample (Rs.)	Total cost in (Rs. In lakhs)
1	Stack	10	SO <sub>2</sub> & NO <sub>x</sub>	Once in a month	120	6000	720000
2	Effluent	3	pH, TDS, TSS, O&G, Free Available Cl, Cu, Fe, Zn, Chromium, PO <sub>4</sub>	Twice in a month	72	600	432000
3	Ground water	1	As per IS: 10500	Once in a month	12	700	84000
4	Noise levels	6	---	Once in a month (hourly)	1728	100	172800
						<b>Total</b>	<b>1408800</b>

**Note : CAAQMS & Continuous Weather Monitoring Station will be provided**



# CHAPTER – 7

## ADDITIONAL STUDIES

### 7.1 INTRODUCTION

As per the Terms of Reference (ToRs) issued vide letter No. J-11011/80/2008-IA II (I) dated 7<sup>th</sup> February 2017 by MoEFCC, New Delhi, following Additional Studies were carried out for the proposed project:

- i. Public Consultation
- ii. Risk Assessment and Disaster Management Plan

### 7.2 PUBLIC CONSULTATION

Public Hearing for proposed steel plant was conducted by Chhattisgarh Environment Conservation Board on 27<sup>th</sup> November, 2017 at the project site.

Details of the Public Hearing include:

- i. Public Hearing notification was given by Chhattisgarh Environment Conservation Board (CECB) has been published in “Dainik Bhaskar” and “Hindustan Times” on 25/10/2017.
- ii. Proceedings of Public Hearing
- iii. Management response for the issues raised during Public Hearing & action plan

#### 7.2.1 PROCEEDINGS OF PUBLIC HEARING

Public Hearing Proceedings are enclosed as Annexure – 10.

**7.2.2 PUBLIC HEARING ADVERTISEMENT**

**सर्वसंबंधितों का सूचना**

भारत सरकार पर्यावरण एवं वन मंत्रालय की अधिसूचना दिनांक 14.09.2006 के तहत सर्वसंबंधितों को सूचित किया जाता है कि मेसर्स विकास मेटलिकस एण्ड एनर्जी लिमिटेड द्वारा ग्राम बरतोरी, तहसील-तिल्दा, जिला-रायपुर (छ.ग.) में प्रस्तावित स्थायी ऑयलर प्लांट क्षमता- 1,20,000 टन/वर्ष, इण्डक्शन फर्नेस विथ सी.सी.एम. एण्ड एलआरएफ क्षमता - 1,35,000 टन/वर्ष, रोलिंग मिल क्षमता - 90,000 टन/वर्ष, वेस्ट हीट रिकवरी बेस्ड पावर प्लांट क्षमता - 08 मेगावॉट, एफ.बी.सी. बेस्ड पावर प्लांट क्षमता 08 मेगावॉट के पर्यावरणीय स्वीकृति हेतु छत्तीसगढ़ पर्यावरण संरक्षण मण्डल में लोक सुनवाई कावत आवेदन किया गया है। उक्त परियोजना से संबंधित ड्राफ्ट ई.आई.ए. रिपोर्ट एवं सार (हिन्दी एवं अंग्रेजी) की प्रतियाँ (साफ्ट कॉपी सहित) कार्यालय कलेक्टर जिला रायपुर, निदेशक, भारत सरकार, पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, इंदिरा पर्यावरण भवन, जोर बाग रोड, नई दिल्ली, मुख्य वन संरक्षक, क्षेत्रीय कार्यालय (वेस्ट सेन्ट्रल जोन), भारत सरकार, पर्यावरण वन एवं जलवायु परिवर्तन मंत्रालय, ग्राउन्ड फ्लोर, ईस्ट विंग न्यू सचिवालय बिल्डिंग, सिविल लाईन नागपुर (महाराष्ट्र), सदस्य सचिव, छत्तीसगढ़ पर्यावरण संरक्षण मंडल, पर्यावास भवन नार्थ ब्लॉक, सेक्टर-19, नया रायपुर, महाप्रबंधक, जिला व्यापार एवं उद्योग केन्द्र, जिला-रायपुर (छ.ग.) मुख्य कार्यपालन अधिकारी, जिला पंचायत, जिला रायपुर (छ.ग.), सरपंच, कार्यालय ग्राम पंचायत बरतोरी, ग्राम-बरतोरी, तहसील-तिल्दा, जिला-रायपुर (छ.ग.) एवं क्षेत्रीय अधिकारी, क्षेत्रीय कार्यालय, छत्तीसगढ़ पर्यावरण संरक्षण मंडल, व्यवसायिक परिसर छत्तीसगढ़ हाऊसिंग बोर्ड कालोनी, कबीर नगर, रायपुर (छ.ग.) स्थित कार्यालयों में अवलोकन हेतु उपलब्ध है, जिसका अवलोकन कार्यालयीन समय में किया जा सकता है। परियोजना के संबंध में सुझाव, विचार, टीका-टिप्पणी, एवं आपत्ति क्षेत्रीय अधिकारी, क्षेत्रीय कार्यालय, व्यवसायिक परिसर, छत्तीसगढ़ हाऊसिंग बोर्ड कालोनी, कबीर नगर रायपुर (छ.ग.) के कार्यालय में कार्यालयीन समय में प्रस्तुत की जा सकती है। इस परियोजना के लिए लोक सुनवाई दिनांक 27.11.2017 (सोमवार) को प्रातः 11:30 बजे ग्राम बरतोरी, तहसील-तिल्दा, जिला-रायपुर के प.ह.न.-13, मेसर्स विकास मेटलिकस एण्ड एनर्जी लिमिटेड के नाम से स्थित भू-खण्ड खसरा नं. 149/16, 20, 21, 25 एवं अन्य पर नियत है, जिसमें भी सुझाव, विचार, टीका-टिप्पणी एवं आपत्ति दर्ज करवाई जा सकती है।

क्षेत्रीय अधिकारी  
 छ.ग. पर्यावरण संरक्षण मण्डल  
 व्यवसायिक परिसर, छत्तीसगढ़ हाऊसिंग बोर्ड  
 कालोनी, कबीर नगर, रायपुर (छ.ग.)

← Newspaper Ad in Dainik Bhaskar

**क्षेत्रीय अधिकारी**  
**छ.ग. पर्यावरण संरक्षण मण्डल, रायपुर**

**सर्वसंबंधितों को सूचना**

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क्षेत्रीय अधिकारी  
 छ.ग. पर्यावरण संरक्षण मण्डल  
 व्यवसायिक परिसर छत्तीसगढ़ हाऊसिंग बोर्ड कालोनी,  
 कबीर नगर, रायपुर (छ.ग.)

Newspaper Ad in Hindustan Times →

**7.2.3 MANAGEMENT RESPONSE FOR THE ISSUES RAISED DURING PUBLIC HEARING & ACTION PLAN [Spec. TOR ii]**

S.No.	Name of the Person & Village	Issue raised	Management Response	Time schedule	Budgetary allocation	Recurring cost
1.	Dr. Kumbh Dahariya, Sarpanch, Village Bartori	Raised the issue of crop damage. He said that 90% of crop is being damaged in the Siltara area. He Further said that an agreement should be made with the company that he will control the pollution	<p>In the proposed project following environment protection measures will be provided for duly complying with norms stipulated by MOEF&amp;CC / CECB:</p> <ul style="list-style-type: none"> <li>• ESP will be provided to DRI Kilns to bring down the particulate emission to less than 50 mg/Nm<sup>3</sup>.</li> <li>• ESP will be provided to Power plant to bring down the particulate emission to less than 30 mg/Nm<sup>3</sup>.</li> <li>• Fume Extraction &amp; Cleaning system with bagfilters will be provided to SMS and Reheating Furnace to bring down the particulate matter emission to less than 50 mg/Nm<sup>3</sup>.</li> <li>• All conveyor will be covered with GI sheets to control the dust emission. Interlocking system will be provided to ESP. This will ensure that whenever ESP fails, the raw material feed to the unit will be stopped and will commence production after ESP is</li> </ul>	Implemented parallel with implementation of the plant	Rs. 26 Crores will be earmarked for Environment protection	Rs. 100 lacs/ Annum

S.No.	Name of the Person & Village	Issue raised	Management Response	Time schedule	Budgetary allocation	Recurring cost
			<p>rectified to comply with the norms.</p> <ul style="list-style-type: none"> <li>• Net resultant Ground level concentrations during operation of the plant after superimposing the incremental concentrations over the maximum baseline concentrations are well within the National Ambient Air Quality Standards.</li> <li>• Zero liquid effluent discharge will be implemented in the proposed project.</li> <li>• Greenbelt will be developed in 11.3 acres of land which will further mitigate the emissions.</li> <li>• All these environmental protection systems will be installed and operated to comply with the norms.</li> </ul> <p>Hence there will not be any significant impact on crop yield</p>			
		He raised the issue of employment, he said that local people should be given priority in employment.	Priority for employment will be given to the land-givers and local youth based on their qualification & experience and the requirement for a particular vacancy.	---	---	---
		He also said that today public hearing should be adjourned as no proper	Public Hearing notification was given by Chhattisgarh Environment	---	---	---

S.No.	Name of the Person & Village	Issue raised	Management Response	Time schedule	Budgetary allocation	Recurring cost
		information has been given to people for public hearing.	Conservation Board (CECB) has been published in "Dainik Bhaskar" and "Hindustan Times" on 25/10/2017.			
2.	Shri. Om Prakash Thakur, Village Bartori	He pointed out that an agreement should be made for employment and for proper measure should be taken to control the pollution and Plantation should be done.	<p>Priority for employment will be given to the land-givers and local youth based on their qualification &amp; experience and the requirement for a particular vacancy.</p> <p>In the proposed project following environment protection measures will be provided for duly complying with norms stipulated by MOEF&amp;CC / CECB:</p> <ul style="list-style-type: none"> <li>• ESP will be provided to DRI Kilns to bring down the particulate emission to less than 50 mg/Nm<sup>3</sup>.</li> <li>• ESP will be provided to Power plant to bring down the particulate emission to less than 30 mg/Nm<sup>3</sup>.</li> <li>• Fume Extraction &amp; Cleaning system with bag filters will be provided to SMS and Reheating Furnace to bring down the particulate matter emission to less than 50 mg/Nm<sup>3</sup>.</li> <li>• All conveyor will be covered with GI sheets to control the dust emission. Interlocking system will be provided to ESP. This will ensure</li> </ul>	---	---	---
				Implemented parallel with implementation of the plant	Rs. 26 Crores will be earmarked for Environmental protection measures for project	Rs. 100 lacs / Annum

S.No.	Name of the Person & Village	Issue raised	Management Response	Time schedule	Budgetary allocation	Recurring cost
			<p>that whenever ESP fails, the raw material feed to the unit will be stopped and will commence production after ESP is rectified to comply with the norms.</p> <ul style="list-style-type: none"> <li>• Net resultant Ground level concentrations during operation of the plant after superimposing the incremental concentrations over the maximum baseline concentrations are well within the National Ambient Air Quality Standards.</li> <li>• Zero liquid effluent discharge will be implemented in the proposed project.</li> <li>• Greenbelt will be developed in 11.3 acres of land which will further mitigate the emissions.</li> <li>• All these environmental protection systems will be installed and operated to comply with the norms.</li> </ul>			
3.	Shri Lakhaan Chauhan, Village Behsar	He said that the water pollution be controlled and the proper measures should be taken for this.	<ul style="list-style-type: none"> <li>• There will not be any effluent discharge from the DRI plant, SMS &amp; Rolling Mill as closed-circuit cooling system will be followed.</li> <li>• The effluent generated will be in</li> </ul>	Implemented parallel with implementation of the plant	Rs. 26 Crores will be earmarked for Environmental protection measures for	Rs. 100 lacs / Annum

S.No.	Name of the Person & Village	Issue raised	Management Response	Time schedule	Budgetary allocation	Recurring cost
			<p>the form of Cooling Tower blowdown, Boiler blow down, D.M. Plant regeneration water and sanitary water.</p> <ul style="list-style-type: none"> <li>• Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.</li> <li>• Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench.</li> <li>• Zero liquid discharge will be followed in the proposed project.</li> </ul>		project	
4.	Shri Saheb Das Manikpuri, Village Behsar	<p>He said that minimum wages as per the Govt. rules should be given, arrangement for prevention of crop damage &amp; Air Pollution should be done.</p>	<p>Minimum wages will be given as per the Govt. norms.</p> <p>In the proposed project following environment protection measures will be provided for duly complying with norms stipulated by MOEF&amp;CC / CECB:</p> <ul style="list-style-type: none"> <li>• ESP will be provided to DRI Kilns to bring down the particulate emission to less than 50 mg/Nm<sup>3</sup>.</li> <li>• ESP will be provided to Power plant to bring down the particulate emission to less than 30 mg/Nm<sup>3</sup>.</li> </ul>	---	---	---
			<ul style="list-style-type: none"> <li>• ESP will be provided to DRI Kilns to bring down the particulate emission to less than 50 mg/Nm<sup>3</sup>.</li> <li>• ESP will be provided to Power plant to bring down the particulate emission to less than 30 mg/Nm<sup>3</sup>.</li> </ul>	Implemented parallel with implementation of the plant	Rs. 26 Crores will be earmarked for Environmental protection measures for project	Rs. 100 lacs / Annum

S.No.	Name of the Person & Village	Issue raised	Management Response	Time schedule	Budgetary allocation	Recurring cost
			<ul style="list-style-type: none"> <li>Fume Extraction &amp; Cleaning system with bagfilters will be provided to SMS and Reheating Furnace to bring down the particulate matter emission to less than 50 mg/Nm<sup>3</sup>.</li> <li>All conveyor will be covered with GI sheets to control the dust emission. Interlocking system will be provided to ESP. This will ensure that whenever ESP fails, the raw material feed to the unit will be stopped and will commence production after ESP is rectified to comply with the norms.</li> <li>Net resultant Ground level concentrations during operation of the plant after superimposing the incremental concentrations over the maximum baseline concentrations are well within the National Ambient Air Quality Standards.</li> <li>Zero liquid effluent discharge will be implemented in the proposed project.</li> <li>Greenbelt will be developed in 11.3 acres of land which will further mitigate the emissions.</li> </ul>			

S.No.	Name of the Person & Village	Issue raised	Management Response	Time schedule	Budgetary allocation	Recurring cost
			All these environmental protection systems will be installed and operated to comply with the norms.			
		He also said that a school & hospital should be open in the village	Will be provided under the Enterprise Social Commitment (ESC) and budget for the same has been allocated.	3 Years	Rs. 3.2 Crores towards ESC	---
5.	Shri Deepak Yadav, Village Jalso	He raised the issue of employment, he said the local people should be given priority in employment	<ul style="list-style-type: none"> <li>Priority for employment will be given to the local youth based on their qualification &amp; experience and the requirement for a particular vacancy.</li> </ul>	---	---	---
6.	Shri Devendra Verma, Village Bartori	He said that no proper information given for public hearing	<ul style="list-style-type: none"> <li>Public Hearing notification has been given by Chhattisgarh Environment Conservation Board (CECB) and has been published in "Dainik Bhaskar" and "Hindustan Times" on 25/10/2017.</li> </ul>	---	---	---
7.	Shri Dharmendra Singh Thakur, Village Bartori	He said that there is no information about public hearing	<ul style="list-style-type: none"> <li>Public Hearing notification has been given by Chhattisgarh Environment Conservation Board (CECB) and has been published in "Dainik Bhaskar" and "Hindustan Times" on 25/10/2017.</li> </ul>	---	---	---
8.	Shri Jitendra Banjare, Village Nakti	He said that there is no information about Public hearing as such it should be adjourned	<ul style="list-style-type: none"> <li>Public Hearing notification has been given by Chhattisgarh Environment Conservation Board (CECB) and has been published in "Dainik Bhaskar" and "Hindustan Times" on 25/10/2017.</li> </ul>	---	---	---

S.No.	Name of the Person & Village	Issue raised	Management Response	Time schedule	Budgetary allocation	Recurring cost
			Times"on 25/10/2017.			
9.	Shri Sumer Singh Thakur, VillagBartori	He said that no information has been given for public hearing, he added that it was the responsibility of sarpanch to inform the village people about today's public hearing	<ul style="list-style-type: none"> <li>Public Hearing notification has been given by Chhattisgarh Environment Conservation Board (CECB) and has been published in "Dainik Bhaskar" and "Hindustan Times"on 25/10/2017.</li> <li>Executive summary has been placed in the village panchayat office.</li> </ul>	---	---	---
10.	Shri Om Prakash Thakur, Village Bartori	He said that it is sure that the Industry will set-up, decision should be in favor of the village.	----	----	----	----
11.	Shri Santosh Verma, VillageBartori	He advised that 15 feet wide road should be provided close to Rly. Lines in the industrial land of the Company for the villager's	<ul style="list-style-type: none"> <li>Management has agreed for the same and will be carried out under ESC activities.</li> </ul>	3 Years	Rs. 3.2 Crores towards ESC	---
		Local people should given priority in employments	<ul style="list-style-type: none"> <li>Priority for employment will be given to the land-givers and local youth based on their qualification &amp; experience and the requirement for a particular vacancy.</li> </ul>	---	---	---
12.	Shri Mahendra Singh Thakur, Village Bartori	He said that Priority willbe given to the land sellers in employment	<ul style="list-style-type: none"> <li>Priority for employment will be given to the land-givers and local youth based on their qualification &amp; experience and the requirement for a particular vacancy.</li> </ul>	---	---	---
13.	Shri Jitendra	He said the minimum wages should be	<ul style="list-style-type: none"> <li>It is assured that Minimum wages</li> </ul>	---	---	---

S.No.	Name of the Person & Village	Issue raised	Management Response	Time schedule	Budgetary allocation	Recurring cost
	Banjare, Village Nakti	given to the workers as fixed by the Govt. and these should be given in writing by the company.	will be given as per the Govt. norms.			
14.	Shri SohanVerma, Ex-Sarpanch, Village Behsar	He said that is there the information for public hearing is only for Bartori village because the people of surroundings have no information of public hearing.	Public Hearing notification has been conducted by Chhattisgarh Environment Conservation Board (CECB) and has been published in "Dainik Bhaskar" and "Hindustan Times" on 25/10/2017.	---	---	---
		Further he said that the details of the Project Cost and works to be done by the company under CSR Head should be disclosed.	Project cost for the proposed project is Rs.125 Crores. Activities to be carried out under the ESC program are listed in Chapter 8 of EIA report.	3 Years	Rs. 3.2 Crores towards ESC	---
		he also said that a written assurance should be given that priority will be given to local people in employments and in CSR works	Priority for employment will be given to the land-givers and local youth based on their qualification & experience and the requirement for a particular vacancy. ESC activities will be taken up by the management.	3 years	Rs. 3.2 Crores towards ESC	---

**7.2.4 SUMMARY OF ESC ACTIVITIES, BUDGET ALLOCATION WITH TIME SCHEDULE**

Total cost of the proposed project	:	Rs. 125 Crores
Expenditure earmarked towards ESC	:	2.5 % of project cost (as per TOR condition)
	:	Rs. 3.2 Crores

S.No.	Major Activity Heads	Years (Rs. In Crores)			Total Expenditure (Rs. In Crores)
		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	
<b>A</b>	<b>Based on Social Impact Assessment (SIA)</b>				
1	Community & Infrastructure Development Programmes (construction toilets in villages which are not covered under Swachh Bharat)	0.3	0.3	0.2	0.80
2	A Community Centre will be established in the Bartori village which will consist of the following: i. Vocational Training Institute with latest tools, machinery & softwares etc. for making them Industry ready. ii. Workshop centre with latest tailoring machines for training women (like tailoring, stitching etc.) iii. Computer / IT Training Centre for improving computer knowledge and making Industry ready.	0.3	0.3	0.4	1.00
3	Education and Scholarship Programmes (construction of class rooms in schools, providing computers in class rooms, development of library facility)	0.12	0.12	0.12	0.36
4	RWH in nearby villages	---	0.05	0.05	0.10
<b>B</b>	<b>Based on Public Hearing / Consultation</b>				
1	Laying of 15 feet village road within the plant site (as per request made by public during PH, construction of over-head tank.)	0.50	---	---	0.50
2	School & Hospital (Basic facilities along with ambulance) should be open in the village	---	0.20	0.24	0.44
<b>Grand Total</b>					<b>3.20</b>

## **7.3 RISK ASSESSMENT [Gen. TOR # 3 (ix) & 7 (xiii)]**

### **7.3.1 INTRODUCTION**

Risk analysis deals with the identification and quantification of risks, the plant equipments and personnel are exposed to, due to accidents resulting from the hazards present in the factory. Hazard analysis involves the identification and quantification of the various hazards that are likely to occur in the industry.

Both hazard and risk analysis are very extensive studies, and require a very detailed design and engineering information.

The various hazard analysis techniques that may be applied are Hazard and Operability (HAZOP) studies, Fault - Tree Analysis (FTA), event –tree analysis and, failure and effects mode analysis. Risk analysis follows an extensive hazard analysis. It involves the identification and assessment of risks the neighboring populations are exposed to as a result of hazards present. This requires a through knowledge of failure probability, credible accident scenario, vulnerability of populations etc. Much of these information's are difficult to get or generate. Consequently, the risk analysis is oftenly confined to maximum creditable accident studies.

### **7.3.2 SCOPE OF THE STUDY**

The scope of study includes the study of proposed operations, storage and handling of raw materials with respect to Hazard Identification. Risk Assessment and preparation of Disaster Management plan. Based on the Hazard Identification and analysis, the major disaster scenarios would be worked out to estimate the consequence of failure. A Disaster Management Plan (DMP) would also be evolved to meet the emergency situation including the occupational health and safety.

### **7.3.3 FIRE PROTECTION SYSTEM**

The following Fire Protection system will be provided in the plant.

- Hydrant system covering the entire plant including all important auxiliaries and buildings. The system will be complete with piping, valves, instrumentation, hoses, nozzles and hydrants, etc.
- Sprinkler system for cable galleries / vaults / spreader room etc.
- High velocity water system for FO storage tanks.

- Portable fire extinguishers such as pressurized water type, carbon dioxide type and foam type will be located at strategic locations through out the plant.
- Modular type carbon dioxide panel injection fire extinguishing system will be provided in control equipment room, cable space below control room and at other unmanned electrical and electronic equipment room.

The following pumps will be provided in the fire protection system.

**Fire water pumps:**

(Fire water reservoir is part of the main water reservoir)

- a) AC motor driven fire water pumps for hydrant, medium velocity water spray system and foam system.
- b) AC motor driven fire water pumps for high velocity water spray system.
- c) Diesel engine driven pump as stand by for the above.
- d) AC motor driven Jackey pump 1 No. for maintaining pressure.

Suitable number of electric motor driven and diesel engine operated hydrant and spray pumps with automatic starting will be provided for the above systems. The fire water pumps will take suction from the fire water reservoir to be created in the plant area.

#### **7.3.4 METHODOLOGY OF MCA ANALYSIS**

The MCA Analysis involved ordering and ranking of various sections in terms of potential vulnerability. The following steps were involved in MCA Analysis.

- Preparation of an inventory of major storages and rank them on the basis of their hazardous properties.
- Identification of potentially hazardous storage sections and representative failure cases from the vessels and the pipelines.
- Visualization of chemical release scenarios.
- Effect and damage calculation from the release cases through mathematical modeling.
- Inventory Analysis and Fire & Explosion and Toxicity Index (FETI) are the two techniques employed for hazard identification process.

### 7.3.5 FIRE & EXPLOSION AND TOXICITY INDEX

The role of Fire & Explosion Index (FEI) aids quantitative hazard identification. The FEI is calculated by evaluating the loss potential of all the units in the storage area and the hazardous areas are classified accordingly. The FEI plays an important role in

- Identification of the equipment/areas that could likely contribute to the creation or escalation of incident and relative ranking of the incidents.
- Quantification of the expected damage of potential fire and explosion incidents.
- Preparation of guidelines for mitigating fire hazards.

The loss potential which could actually be experienced under the most adverse operating conditions is quantitatively evaluated. The FEI is used for any operation in which a flammable, combustible or reactive material is stored, handled or processed.

$$FEI = MF * GPH * SPH$$

Where MF : Material factor  
GPH : General Process Hazard  
SPH : Special Process Hazard

### TOXICITY INDEX

The Toxicity Index is calculated using the the following formula.

$$TI = \frac{(N_h + T_s) * (1 + GPH + SPH)}{100}$$

Where N<sub>h</sub>:

T<sub>s</sub>:

GPH: General Process Hazard

SPH: Special Process Hazard

**7.3.6 ASSESSMENT OF RISK AT M/s. VIKAS METALIKS & ENERGY LIMITED**

Based on the storage inventory the following areas are identified as potential safety risk areas, shown in table 7.1

**TABLE 7.1**  
**POSSIBLE RISKS FROM THE STEEL PLANT**

Equipment	Process	Potential Hazard	Provision
<b>DRI PLANT</b>			
Sponge Iron Kiln	Reduction of Iron Ore	Falling of Hot Mass & Dust	<ul style="list-style-type: none"> <li>Ensuring before opening the kiln bottom door, first clean the inner surface of the stack cap, such that the dust particle and hard clinkers which deposited in the cap is fallen into the DSC.</li> <li>Ensure before opening the DSC bottom door to check the DSC bar position and condition and to clean if big block of castables or any hard clinkers which is blocking the dust flow passage to wet scrapper chute.</li> <li>Ensure to clean the dust by opening the man hole provided in the chute and check the spiking rods and the screen. In built safety system is provided in the construction of furnace with suitable refractory walls.</li> <li>Allow the wet scrapper to run to remove the sludge, then open the drain pipe of the wet scrapper, which is located at bottom on either side, pour sufficient water to clean the sludge and the slurry dust to flow through drain pipe.</li> <li>Ensure to stop the wet scrapper and open the top plate to check the alignment, weak and tear of the plates and take necessary precaution against the excessive worn out plate.</li> </ul>
Sponge Iron Kiln	Reduction of Iron Ore	Air emission	<ul style="list-style-type: none"> <li>Adequately designed ESP and other Air Pollution control systems will be provided with internal lock to the kiln feeding system in order to prevent by passing of emissions through safety cap and also during non operation of ESP or any other pollution control devices.</li> </ul>
<b>POWER PLANT</b>			
Turbine	Convert pressure in the flue gas	Mechanical & Fire Hazards Noise	<ul style="list-style-type: none"> <li>Layout of Equipment / Machinery will be in accordance to factory and electrical inspectorate.</li> </ul>

Equipment	Process	Potential Hazard	Provision
	into Mechanical Energy		<ul style="list-style-type: none"> <li>Acoustic enclosure to Turbine</li> </ul>
Generator	Convert Mechanical energy into electrical energy	Mechanical & Fire Hazards a) Lube Oil System b) Cable galleries c) Short circuits	<ul style="list-style-type: none"> <li>Layout of Equipment / Machinery will be in accordance to factory and electrical inspectorate.</li> </ul>
		Noise	<ul style="list-style-type: none"> <li>Acoustic enclosure</li> <li>Isolated panel rooms</li> <li>Special foundation with vibration absorbers</li> </ul>
Power Transformers	50,000 KVA capacity	Fire and explosion	Automatic fire fighting system will be provided. Isolated with fencing and restricted entry.
Switch Yard	transformer	Fire	All electrical fittings and cables are provided as per the specified standards.
Switch Yard control room		Fire in cable galleries and switch	
Coal storage shed	Storage of coal for 10 days requirement.	Fire and spontaneous combustion	Coal storage yard will be continuously sprinkled with water with garden type sprinklers.
Coal handling bunkers	----	Fire and dust explosions	Continuous water sprinkling
Compressor House	Plant operation	Governor failure due to the failure of pins and springs leading to opening of safety valves	The design precautions of safety will be followed in manufacture and erection of compressors.
Coal storage yard	Coal dust is combustible	Explosion Hazard	<ul style="list-style-type: none"> <li>Coal storage shall be minimised</li> <li>Coal piles shall not be located above heat sources such as steam lines.</li> <li>motors.</li> <li>All mechanical &amp; electrical equipment inside the coal storage area shall be approved for use in hazardous locations and provided with spark proof</li> </ul>
STG, draft fans, soot blowing from boiler, ventilation pipes	Noise generated due to operation of STG, working of fans, ventilation system,	Noise hazard	<ul style="list-style-type: none"> <li>Acoustic enclosures will be provided to STG.</li> <li>Enclose fans, insulating ventilation pipes</li> <li>use of dampeners.</li> </ul>

Equipment	Process	Potential Hazard	Provision
Failure of APCS	Dust / Smoke	Air emission	<ul style="list-style-type: none"> <li>• Interlocking system will be provided and whenever APCS is not working, then raw material feed will be stopped. Consequently there will be no production in the unit till APCS is rectified.</li> <li>• The unit cannot be stopped immediately and it will take some time to stop. During this period release of particulate matter will take place, hence mobile dust suppression system will be provided to suppress the particulate matter immediately to mitigate the impact of PM on surroundings.</li> <li>• Depending upon the wind direction at the time of emergency, Mobile dust suppression equipments will be provided to suppress the dust within the plant and also outside the plant to reduce the impact on habitation, water body, crops etc.</li> <li>• Immediately upon failure of any APCS, emergency siren will be blown to inform the employees and nearby villagers about the emergency.</li> <li>• Dust masks will be provided to the employees and near by villagers. Immediately upon hearing siren, every employee and villager must wear the dust mask.</li> <li>• Mock drills will be conducted in the nearby villages for the emergency preparedness.</li> </ul>

**Coal Handling Plant - Dust Explosion**

Coal dust when dispersed in air can explode if it gets ignition source. Crusher houses and conveyor systems are most susceptible to this hazard. The minimum of explosive concentration of coal dust (33% volatiles) is 50 grams/m<sup>3</sup>. Failure of dust extraction & suppression systems may lead to abnormal conditions and may increase the concentration of coal dust upto the explosive limits. The sources of ignition are incandescent bulbs, electric equipment & cables, friction & spontaneous combustion in accumulated dust. Dust explosion may occur at any time without any warning with maximum explosion pressure of 6.4 bars. Another dangerous characteristic of dust explosions is that it sets off secondary explosions after the occurrence of initial dust explosion.

Stock pile area shall be provided with automatic garden type sprinklers for dust suppression as well as to reduce spontaneous ignition/combustion in coal stock piles. Necessary water distribution net work will be provided for distributing water at all transfer points, crusher house, control room, etc.

A centralized control room with microprocessor based control system has been envisaged for operation of the coal handling plant. Except locally controlled equipment like travelling tripper, dust extraction / dust suppression / ventilation equipment, sump pumps, water distribution system all other equipments will have provision for local control as well.

#### **Control Measures for Coal Storage Yard**

The entire quantity of coal will be stored in separate stack piles, with proper drains around to collect washouts during the monsoon. Water sprinkling system will be installed in and around the stocks of pile to prevent spontaneous combustion and consequent fire hazards. The stack geometry will be adopted to maintain minimum exposure of stock pile areas towards predominant wind direction. Temperature will be monitored regularly to detect any abnormal rise in temperature inside the stock pile to be enabled to control the same.

### **7.3.7 RISK & CONSEQUENCE ANALYSIS OF FIRE**

The principle objective of this study is to identify the potential hazards, estimate the effects of hazards to people both with in and outside the plant premises.

- Identification of possible failure cases of the facilities which might affect the population and property within the plant boundary.
- Assessment of consequential effect on surrounding population, property etc., due to onset of such failures.
- Suggest recommendations based on consequence analysis relevant to the situations.

#### **7.3.7.1 METHODOLOGY**

The hazards expected from this plant include the pool fire situation due to the leakage of HFO, LDO & FO from the storage tanks. There will be two Nos. of FO storage tanks each of 25 m<sup>3</sup> capacity, one No. of storage tank for HFO with a capacity of 25 m<sup>3</sup> & one No. of storage tank for LDO with a capacity of 25 m<sup>3</sup>. The tanks, made of Mild steel, will be provided with dyke. The

most credible failure is due to the rupture of the pipe connecting the storage tank. The worst case can be assumed as when the entire contents leak out into the dyke forming a pool, which may catch fire after getting source of ignition.

#### **HFO, LDO & FO STORAGE TANK - POOL FIRE SCENARIO**

The maximum quantity of HFO, LDO & FO stored at site will be 1 x 25 m<sup>3</sup>, 1 x 25 m<sup>3</sup> & 2 x 25 m<sup>3</sup> capacity respectively. In the event of oil spillage through a small leakage or due to rupture of pipeline connecting the tank fire will follow after getting ignition source. As the tanks are provided with dyke, the fire will be confined within the dyke. Threshold limit for first degree burns is 4.5 kw/m<sup>2</sup>. Based on these results it may be concluded that the vulnerable zone in which the thermal fluxes above the threshold limit for first degree burns (4.5 kw/m<sup>2</sup>) is restricted to 19 m.

The hazard distances for various radiation intensities are shown in table 7.2

**TABLE 7.2**

#### **HAZARD DISTANCES (Four Tanks on fire - scenario)**

HFO Quantity: 1 x 25 m<sup>3</sup>

LDO Quantity: 1 x 25 m<sup>3</sup>

FO Quantity: 2 x 25 m<sup>3</sup>

<b>Radiation intensity</b>	<b>Hazard Distances</b>
37.5 kw/m <sup>2</sup> (100% lethality)	2 m
25.0 kw/m <sup>2</sup> (50% lethality)	7 m
12.5 kw/m <sup>2</sup> (1% lethality)	12 m
4.5 kw/m <sup>2</sup> (1 <sup>st</sup> degree burns)	19 m

The hazard distances for Thermal radiation are confined to the plant premises only. Hence there will not be any thermal radiation impact on outside the population due to the pool fire scenario. The thick green belt to be developed will help to further mitigate the radiation intensity level outside plant boundary.

## **7.4 DISASTER MANAGEMENT PLAN**

### **7.4.1 DISASTERS**

A disaster is catastrophic situation in which suddenly, people are plunged into helplessness and suffering and as a result need protection, clothing, shelter, medical and social care and other necessities of life.

Disasters can be divided into two main groups. The first group includes those disasters which result from natural phenomena like earthquakes, volcanic eruptions, cyclones, tropical storms, floods, avalanches, landslides etc. The second group includes disastrous events occasioned by humans, or by their impact upon the environment. Examples are industrial accidents, radiation accidents, factory fires, explosions, escape of toxic gases or chemical substances from an industrial unit, river pollution, mining or other structural collapses; air, sea, rail and road transport accidents. These disastrous events can reach catastrophic dimensions in terms of human loss.

There can be no set criteria for assessing the gravity of a disaster because it depends, to a large extent, on the physical, economic and social environment in which it occurs. What would be considered a major disaster in developing country, equipped to cope with the problems involved, may not mean more than temporary emergency elsewhere. However, all disasters bring in their wake similar consequences that call for immediate action, whether at the local, national or international level, for the rescue and relief of the victims. This includes the search for the dead and injured, medical and social care, removal of the debris, the provision of temporary shelter for the homeless, food, clothing and medical supplies and the rapid re-establishment of essential services.

### **7.4.2 OBJECTIVES OF DISASTER MANAGEMENT OF PLAN**

The disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. Effective implementation of Disaster Management Plan will be ensured by its wide circulation among the staff and workers and training of the personnel through rehearsals.

The Disaster Management Plan would reflect the probable consequential severity of undesired event due to deteriorating conditions or through knock on effects. Further the management should be able to demonstrate that their assessment of the consequences uses good supporting

evidence and based on currently available and reliable information, incident data from internal and external sources and if necessary the reports of outside agencies.

To tackle the consequences of a major emergency inside the factory or immediate vicinity of the factory, a Plan has to be formulated and this emergency plan is called Disaster Management Plan.

The objective of the Industrial Disaster Management Plan is to make use of the combined resources of the Plant and the outside services to achieve the following:

- Pool fire scenario due to HFO/LDO/FO storage
- Minimize damage to the property and the environment.
- Effect the rescue and medical treatment of victims.
- Fulfill the needs of relatives.
- Provide authoritative information to news media.
- Secure the safe rehabilitation of affected areas.
- Safeguard other people.
- Initially contain and then ultimately bring the situation under the control.
- Preserve subsequent records and equipment for subsequent enquiry of the cause and circumstances leading to emergency.

### **7.4.3 EMERGENCIES**

#### **7.4.3.1 GENERAL EMERGENCIES ANTICIPATED:**

The emergencies that could be envisaged in the Plant are as follows:

- Pool fire scenario at HFO/LDO/FO storage tanks.
- Contamination of food / water.
- Sabotage / social disorder.
- Structural failures.
- Slow isolated fires.

#### **7.4.3.2 SPECIFIC EMERGENCIES ANTICIPATED**

During the study of risk assessment, the probabilities of occurrence of hazards are worked out along with the nature of damage. This is the reason why one should study risk assessment in conjunction with DMP.

#### **7.4.3.3 EMERGENCY ORGANISATION**

It is recommended to setup an Emergency Organization. A senior executive who has control over the affairs of the Plant would be heading the Emergency Organization. He would be designated as Site Controller. In the case of stores, utilities, open areas which are the not under the control of production heads, executive responsible for maintenance of utilities would be designated as Incident Controller. All the Incident Controllers would be reporting to the Site Controller.

Each Incident Controller organizes a team responsible for controlling the incident with the personnel under his control. Shift in-charge would be the Reporting Officer, who would report the incident to the Incident Controller.

Emergency Coordinators would be appointed who would undertake the responsibilities like fire fighting, rescue, rehabilitation, transport and support services. For this purposes, Security in-charge, staff of the Personnel Department/ Essential services would be engaged. All these personnel would be designated as key personnel.

In each shift, electrical supervisor, pump house incharge and other maintenance staff would be drafted for emergency operations. In the event of Power communication system failure, some of staff members in the office/ Plant offices would be drafted and their services would be utilised as messengers for quick passing of communications. All these personnel would be declared as essential personnel.

#### **7.4.3.4 EMERGENCY COMMUNICATION**

Whosoever notices an emergency situation such as fire, growth of fire, leakage etc. would inform his immediate superior and Emergency Control Center. The person on duty in the Emergency Control Centre would appraise the site controller. Site controller verifies the situation from the Incident Controller of that area or the shift incharge and takes a decision about implementing on Site Emergency Plan. This would be communicated to all the Incident

Controllers and Emergency Coordinators. Simultaneously, the emergency warning system would be activated on the instructions of the Site Controller.

#### **7.4.3.5 EMERGENCY RESPONSIBILITIES**

The responsibilities of the key personnel are appended below

##### **7.4.3.5.1 SITE CONTROLLER**

On receiving information about emergency, he would rush to Emergency Control Centre (ECC) and take the charge of ECC and the situation. He would assess the magnitude of the situation in consultation with the incident controller and decide:

- Whether affected area needs to be evacuated.
- Whether personnel who are at assembly points need to be evacuated.
- Declares Emergency and orders for operation of emergency siren.
- Organizes announcement by public address system about location of emergency.
- Assesses the areas which are likely to be affected, and need to be evacuated or alerted.
- Maintains a continuous review of possible development and assesses the overall situation to decide whether shutting down of any section or whole of the Plant is required.
- Directs personnel of rescue, rehabilitation, transport, fire brigade, medical and other designated mutual support systems, locally available, for meeting emergencies.
- Controls evacuation of affected areas. If the situation is likely to go out of control or effects are likely to go beyond the premises of the factory, informs to District Emergency Authority, Police, and Hospital and seeks their intervention and help.
- Informs Inspector of factories, Deputy Chief Inspector of factories, SPCB and other statutory authorities.
- Gives public statement, if necessary.
- Keeps record of chronological events and prepares an investigation report and preserves the evidences.

After managing the emergent situation and bringing the normalcy at the work place, he makes an statement accordingly

#### **7.4.3.5.2 INCIDENT CONTROLLER**

- Assembles the incident control team.
- Directs operations within the affected areas with the priorities for safety to personnel, minimizes damage to the plant, property and environment and minimizes the loss of materials.
- Directs the shutting down and evacuation of Plant and areas likely to be adversely affected by the emergency.
- Ensures that all-key personnel help is sought.
- Provides advice and information to the Fire and Security officer and the local Fire Services as and when they arrive.
- Ensures that all non-essential workers / staff of the effected areas evacuated to the appropriate assembly points and the areas are searched for victims, if any
- Understands the need for preservation of evidence so as to facilitate any enquiry into the cause and circumstances, which resulted or escalated the emergency.
- Coordinates with emergency services at the site.
- Provides tools and safety equipments to the team members.
- Keeps in touch with the team and advise them regarding the method of control to be used.
- Keeps the Site Controller informed continuously about the progress being made?

#### **7.4.3.5.3 EMERGENCY COORDINATOR - RESCUE, FIRE FIGHTING**

- Rushes to Emergency Control Centre after knowing about the emergency.
- Helps the Incident Controller in containment of the emergency.
- Ensures fire pumps in operating conditions and instructs pump house operator to be ready for any emergency.
- Guides the fire fighting crew i.e. Firemen, trained Plant personnel and security staff.
- Organizes shifting the fire fighting facilities to the emergency site, if required.
- Takes guidance of the Incident Controller for fire fighting as well as assesses the requirements of outside help.
- Arranges the traffic control at the gate and the incident area.

- Directs the security staff to the incident site to take part in the emergency operations under his guidance and supervision.
- Evacuates the people in the Plant or in the near by areas as advised by site controller.
- Searches for any casualties and arranges proper aid for them.
- Assembles search and evacuation team.
- Decides paths for the workers evacuating the site
- Maintains law and order in the area, and if necessary seeks the help of police and local administration.
- Arranges safety tools/equipments for the members of his team.

#### **7.4.3.5.4 EMERGENCY COORDINATOR - MEDICAL, MUTUAL AID, REHABILITATION, TRANSPORT AND COMMUNICATION**

- The event of failure of electric supply and there by internal telephone, sets up communication point and establishes contact with the Emergency Control Center (ECC) in the event of failure of electric supply and communication network.
- Organizes medical treatment to the injured and if necessary, will shift them to nearby hospitals.
- Mobilizes extra medical help from outside, if necessary
- Keeps a list of qualified first aid providers of the factory and seek their assistance.
- Maintains first aid and medical emergency requirements.
- Makes sure that all safety equipments are made available to the emergency team.
- Assists Site Controller with necessary data and coordinates the emergency activities.
- Assists Site Controller in updating emergency plan.
- Maintains liaison with Civil Administration.
- Ensures availability of canteen facilities and maintenance of rehabilitation centre.
- Remains in liaison with Site Controller / Incident Controller.
- Ensures availability of necessary cash for rescue / rehabilitation and emergency expenditure.
- Controls rehabilitation of affected areas at the end of emergency.
- Makes available diesel/petrol for transport vehicles engaged in emergency operation.

#### **7.4.3.5.5 EMERGENCY COORDINATOR – ESSENTIAL SERVICES**

He would assist Site Controller and Incident Controller

- Maintains essential services like Diesel Generator, Water, Fire Water, Compressed Air / Instrument Air, Power Supply for lighting.
- Plans alternate facilities in the event of Power failure, to maintain essential services such as lighting, etc.
- Organizes separate electrical connections for all utilities and during emergency ensures that the essential services and utilities are not affected.
- Gives necessary instructions regarding emergency electrical supply, isolation of certain sections etc to shift incharges and electricians.
- Ensures availability of adequate quantities of protective equipments and other emergency materials, spares etc.

#### **7.4.3.5.6 GENERAL RESPONSIBILITIES OF EMPLOYEES DURING AN EMERGENCY**

When an emergency warning is raised, the workers, if they are incharge of any process equipment, should adopt safe and emergency shut down and attend any prescribed duty as an essential employee. If no such responsibility has been assigned, he should adopt a safe course to assembly point and await instructions. He should not resort to spread panic. On the other hand, he must assist emergency personnel towards objectives of DMP.

#### **7.4.3.6. EMERGENCY FACILITIES**

##### **7.4.3.6.1 EMERGENCY CONTROL CENTRE**

During the emergency, the office block would function as Emergency Control Centre. It would have external Telephone & Fax facility. All the Incident Controllers, Officers, senior personnel would be available there.

The following information and equipments will be provided at the ECC.

- Intercom, telephone
- Fire suit / gas tight goggles / gloves / helmets
- Factory layout, emergency site plan
- Emergency lamp / torchlight

- Plan indicating locations of hazardous inventories, Plant control room, sources of safety equipment, work road plan, assembly points, rescue locations, vulnerable zones, escape routes.
- Hazard chart
- Self-contained breathing apparatus
- Hand tools, wind direction, wind velocity indications
- Public Address Megaphone, Hand bell, Telephone directories (Internal and P&T).
- Address with telephone numbers of key personnel, Emergency coordinator.
- Important addresses, telephone numbers of experts from outside, government agencies, neighboring industries etc.
- Emergency shut down procedures.
- Nominal roll of employees.

#### **7.4.3.6.2 EMERGENCY POWER SUPPLY**

Plant facilities would be connected to Diesel Generator and would be placed in auto mode.

#### **7.4.3.6.3 FIRE FIGHTING FACILITIES**

First Aid and Fire Fighting equipment suitable for emergency should be maintained as per statutory requirements/ TAC Regulations. Fire hydrant line covering major areas would be laid. It would be maintained at 6 kg / sq.cm. pressure.

#### **7.4.3.6.4 LOCATION OF WIND SOCK**

On the top of production block and on the top of administrative block wind socks would be installed to indicate direction of wind during emergency period.

#### **7.4.3.6.5 EMERGENCY MEDICAL FACILITIES**

Gas masks and general first aid materials for dealing with chemical burns, fire burns etc. would be maintained in the medical centre as well as in the emergency control room. Private medical practitioners help would be sought. Government hospital would be approached for emergency help.

Apart from Plant first aid facilities, external facilities would be augmented. Names of Medical Personnel, Medical facilities in Tilda & Raipur town would be prepared and updated. Necessary

specific medicines for emergency treatment of burnt patients and for those affected by toxicity would be maintained.

Breathing apparatus and other emergency medical equipment would be provided and maintained. The help of near by industrial managements in this regard would also be taken on mutual support basis.

#### **7.4.3.7 EMERGENCY ACTIONS**

##### **7.4.3.7.1 EMERGENCY WARNING**

Communication of emergency would be made familiar to the personnel inside the plant and people outside. An emergency warning system would be established.

##### **7.4.3.7.2 EMERGENCY SHUTDOWN**

There are number of facilities which can be provided to help in dealing with hazardous conditions. The suggested arrangements are

- Stop feed
- Deluge contents
- Remove heat
- Transfer contents

Methods of removing additional heat include removal by the normal cooling arrangements or by the use of an emergency cooling system. Cooling facilities which vaporizes liquid may be particularly effective, since a big increase in vaporization can be obtained by reducing pressure.

##### **7.4.3.7.3 EVACUATION OF PERSONNEL**

The area would have adequate number of exits and staircases. In the event of an emergency, unrelated personnel have to escape to assembly point. Operators have to take emergency shutdown procedure and escape. Time office maintains a copy of deployment of employees in each shift at Emergency Communication Centre. If necessary, persons can be evacuated by rescue teams.

##### **7.4.3.7.4 ALL CLEAR SIGNAL**

At the end of emergency, after discussing with Incident Controllers and Emergency Coordinators, the site controller orders an all clear signal.

## **7.5 OCCUPATIONAL HEALTH AND SURVEILLANCE**

Large industries where multifarious activities are involved during construction, erection, testing, commissioning, operation and maintenance, the men, materials and machines are the basic inputs. Along with the booms, the industrialization generally brings several problems related with health and safety of the workmen.

### **7.5.1 OCCUPATIONAL HEALTH**

Occupational health needs attention both during construction and operation phases. However, the problem varies both in magnitude and variety in the above phases.

### **7.5.2 CONSTRUCTION & ERECTION**

The occupational health problems envisaged at this stage can mainly be due to constructional activities and noise.

To overcome these hazards, in addition to arrangements required to reduce it within TLV'S, personnel protective equipments should also be supplied to workers.

### **7.5.3 OPERATION & MAINTENANCE**

The working personnel would be given the following appropriate personnel protective equipments.

- Industrial Safety helmets
- Crash helmets
- Face shield with replacement acrylic vision
- Zero power plain goggles with cut type filters on both ends
- Zero power goggles with cut type filters on both sides and blue colour glasses
- Welders equipment for eye and face protection
- Cylindrical type earplug
- Ear plugs
- Canister gas masks
- Self contained breathing apparatus
- Leather apron
- Boiler suit
- Safety belt / line man's safety belt

- Leather hand gloves
- Asbestos hand gloves
- Canvas cum leather hand gloves with leather palm
- Industrial safety shoes with steel toe
- Electrical safety shoes without steel toe and gum boots

#### **7.5.4 OCCUPATIONAL HEALTH [Gen. TOR # 8 (i)]**

##### **Anticipated Occupational & Safety Hazards**

- ❖ Heat Stress & Stroke
- ❖ Dehydration
- ❖ Skin disorders
- ❖ Dust Exposure
- ❖ Metallic dust exposure
- ❖ Noise
- ❖ Illumination
- ❖ Burns and shocks due electricity

The health of workers can be protected by adopting the following measures:

- ❖ Relaxation facilities to workers in working in furnace are in separate rooms with good ventilation & air circulation. This will help in relieving of thermal stress.
- ❖ Good Housekeeping practices
- ❖ Good ventilation & exhaust system
- ❖ Enforcement of usage of Personal Protective Devices.
- ❖ Rotation of employees in specific areas to avoid continuous exposure.
- ❖ Earplugs will be provided to employees working in noise prone areas such as STG,
- ❖ Periodic monitoring of noise levels Fugitive emissions, emissions from stack, dust suppression system, etc.

##### **Frequency of Periodical Examination:**

For employees once in a year

**Personal Protective Devices and Measures**

- Industrial Safety helmets
- Fall arrestor
- Safety nets (for fall protection)
- Crash helmets
- Face shield with replacement acrylic vision
- Safety goggles
- Welders equipment for eye and face protection
- Ear plugs
- Canister gas masks
- Welding face shield
- Welding hand sleeve
- Self contained breathing apparatus
- Leather apron
- Safety belt / line man's safety belt
- Leather hand gloves
- Asbestos hand gloves
- Industrial safety shoes with steel toe
- Electrical safety shoes without steel toe and gum boots
- Protective clothing etc.

**Plan of pre-placement and periodical health status of workers:**

Pre-employment check up will be made mandatory and following test will be conducted:

- Plan of evaluation of health of workers
- Chest x rays
- Audiometry
- Spirometry
- Vision testing (Far & Near vision, color vision and any other ocular defect)
- ECG
- Haemogram (examination of the blood)
- Urine (Routine and Microscopic)

- Complete physical examination
- Musculo-skeletal disorders (MSD)
- Backache
- Pain in minor and major joints
- Fatigue, etc.
- Medical records of each employee is maintained separately and updated as per finding during monitoring. Age, sex wise, department wise data on the above parameters is maintained.
- Medical records of the employee at the end of his / her term are will be updated.

**List of equipment for Occupational Health Monitoring**

- ECG
- Analytical Pan Balance
- Dust Sampling devices
- Heat stress monitoring device (Personal)
- Spectrophotometer
- Noise Monitoring device (dosimeter)
- Spiro meter
- Audiometric device
- Vision screener

**Budget for DMP and OHS [Gen. TOR # 8 (iv)]**

- Capital cost of Rs. 1.0 Crore & Recurring cost of Rs. 6.0 lakhs per annum will be allocated on Occupational health & Safety in the proposed project.
- Occupational health check up will be outsourced by third party. However, a Primary Health Centre (PHC) with ambulance facility will be provided within the plant, with an investment of Rs. 30.0 Lakhs.
- Fire fighting system will be provided all through the plant with an investment of Rs. 70.0 Lakhs

## 7.6 SAFETY PLAN

Safety of both men and materials during construction and operation phases is of great concern. The preparedness of an industry for the occurrence of possible disasters is known as emergency plan. The disaster in Project is possible due to collapse of structures and fire / explosion etc. The details of fire fighting equipments to be installed are given below:

- Carbon dioxide type
- Foam type
- DCP type
- Soda acid type
- Fire buckets
- Fire hydrants

Keeping in view the safety requirement during construction, operation and maintenance phases, **Vikas Metaliks & Energy Limited** has formulated safety policy with the following regulations.

- To take steps to ensure that all known safety factors are taken into account in the design, construction, operation and maintenance of Plants, machinery and equipment.
- To allocate sufficient resources to maintain safe and healthy conditions of work.
- To ensure that adequate safety instructions are given to all employees.
- To provide where ever necessary protective equipment, safety appliances and clothing and to ensure their proper use.
- To inform employees about materials, equipments or processes used in their work which are known to be potentially hazardous to health and safety.
- To keep all operations and methods of work under regular review for making necessary changes from the safety point of view in the light of experience and up to date knowledge.
- To provide appropriate facilities for first aid and prompt treatment of injuries and illness at work.
- To provide appropriate instructions, training and supervision to employee's health and safety, first aid and to ensure that adequate publicity is given to these matters.

- To ensure proper implementation of fire preventive methods and an appropriate fire fighting service along with training facilities for personnel involved in this service.
- To publish / notify regulations, instructions and notices in the common language of employees.
- To prepare separate safety rules for each type of process involved.
- To ensure regular safety inspection by a competent person at suitable intervals of all buildings, equipments, work places and operations.

### **7.6.1 SAFETY ORGANISATION**

#### **7.6.1.1 CONSTRUCTION AND ERECTION PHASE**

A highly qualified and experienced safety officer will be appointed. The responsibilities of the safety officer include identification of the hazardous conditions and unsafe acts of workers and advice on corrective actions, conduct safety audit, organize training programmes and provide professional expert advice on various issues related to occupational safety and health. In addition to employment of safety officer, every contractor, whose employees will be more than 250, would also be asked to employ one safety officer to ensure safety of the workers in accordance with the conditions of the contract.

#### **7.6.1.2 OPERATION & MAINTENANCE PHASE**

After the completion of construction, the posting of safety officer would be in accordance with the requirements of Factories Act and he will be assigned the duties and responsibilities accordingly.

#### **7.6.1.3 SAFETY CIRCLE**

In order to fully develop the capabilities of the employees in identification of hazardous processes and improving safety and health, safety circles would be constituted in each area of work. The circle would consist of 5-6 employees from that area. The circle would normally meet for about an hour every week.

### **7.6.2 SAFETY TRAINING**

A full fledged training centre will be established at **Vikas Metaliks & Energy Limited** Safety training will be provided by the safety officers with the assistance of faculty members called from professional safety institutions and universities. In addition to regular employees, limited

contractor labours will also given safety training. To create safety awareness safety films will be shown to workers and leaflets etc. will be distributed.

### **7.6.3 HEALTH AND SAFETY MONITORING PLAN**

All the potential occupational hazardous work places will be monitored regularly. The health of employees working in these areas will be monitored once in a year

## **7.6 SOCIAL IMPACT ASSESSMENT**

The local areas will be benefited by way of generation of employment opportunities, increased demand for local products and services. There will be an improvement in the income level of the local people.

The project creates employment to about 200 persons once the plant comes to the operational stage of un-implemented units and for 500 persons during construction stage. Priority will be given to locals for Semi-Skilled and Unskilled jobs.

Due to this the economic conditions, the educational and medical standards of the people living in the study area will certainly move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

The successful commissioning and running of the proposed plant will attract more industrial investments which in turn will benefit the society and the nation.

## **7.7 R & R ACTION PLAN**

There is no habitation in the proposed site. Hence no Rehabilitation & Resettlement Action Plan will be required.

# CHAPTER – 8

## PROJECT BENEFITS



### 8.1 PHYSICAL INFRASTRUCTURE

Once the proposed activity is commissioned, the socio-economic status of the local people will improve and there by infrastructure facilities like communication systems will improve.

### 8.2 SOCIAL INFRASTRUCTURE

With the implementation of the proposed plant, the socio-economic status of the local people will improve substantially. The land rates in the area will improve in the nearby areas due to the proposed activity. This will help in upliftment of the social status of the people in the area. Educational institutions will also come-up and will lead to improvement of educational status of the people in the area. Primary health and medical facilities will certainly improve due to the proposed plant.

### 8.3 EMPLOYMENT POTENTIAL **[Gen.TOR # 3 (vii)]**

The proposed plant creates employment to 500 people during construction and 200 people during operation of the proposed project.

#### 8.3.1 SKILLED

Total skilled employment in the proposed plant will be 30.

#### 8.3.2 SEMI-SKILLED

Total Semi-skilled employment in the proposed plant will be 50. Priority will be given to local people for semi-skilled jobs.

#### 8.3.3 UNSKILLED

Total Unskilled employment in the proposed plant will be 120. Top priority will be given to local people for unskilled jobs.

**8.4 SOCIO-ECONOMIC DEVELOPMENTAL ACTIVITIES PROPOSED**

**[Sp. TOR # (iii) & Gen.TOR # 11(i)]**

**[ENTERPRISE SOCIAL COMMITMENT (ESC)]**

Vikas Metaliks & Energy Limited will be actively contribute to improve the Socio-economic conditions of the area by providing assistance for local persons preferable from the nearby villages. The continuing commitment by business to behave ethically and contribute to economic development while improve the quality of life of workforce and their families as well as that of the local community and society at large.

**Details of expenditure for ESC activities**

Total cost of the proposed project	:	Rs. 125 Crores
Expenditure earmarked towards ESC	:	2.5 % of project cost (as per TOR condition)
Work out to	:	Rs. 3.2 Crores

**Detailed activity wise expenditure to be incurred in a span of 3 years**

S.No.	Major Activity Heads	Years (Rs. In Crores)			Total Expenditure (Rs. In Crores)
		1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	
<b>A</b>	<b>Based on Social Impact Assessment (SIA)</b>				
1	Community & Infrastructure Development Programmes (construction toilets in villages which are not covered under Swachh Bharat)	0.3	0.3	0.2	0.80
2	A Community Centre will be established in the Bartori village which will consist of the following: i. Vocational Training Institute with latest tools, machinery & softwares etc. for making them Industry ready. ii. Workshop centre with latest tailoring machines for training women (like tailoring, stitching etc.) iii. Computer / IT Training Centre for improving computer knowledge and making Industry ready.	0.3	0.3	0.4	1.00

3	Education and Scholarship Programmes (construction of class rooms in schools, providing computers in class rooms, development of library facility)	0.12	0.12	0.12	0.36
4	RWH in nearby villages	---	0.05	0.05	0.10
<b>B</b>	<b>Based on Public Hearing / Consultation</b>				
1	Laying of 15 feet village road within the plant site (as per request made by public during PH, construction of over-head tank.)	0.50	---	---	0.50
2	School & Hospital (Basic facilities along with ambulance) should be open in the village	---	0.20	0.24	0.44
<b>Grand Total</b>					<b>3.20</b>

## CHAPTER – 9



# ENVIRONMENTAL COST BENEFIT ANALYSIS

All the required environmental protection measures will be implemented in the proposed plant and will be operated to comply with the MOEF&CC/CPCB/SPCB norms. **Rs. 26 Crores** is earmarked as capital investment for environmental protection measures in the proposed project & **Rs. 100 Lakhs/Annum** for Recurring cost for Pollution control measures.

### BREAK-UP OF BUDGET FOR ENVIRONMENTAL PROTECTION MEASURES

**[Gen. TOR # 7 (xi) & 8 (iv)]**

S.No	Item	Capital Cost (Rs.in Crores)	Recurring Cost / Annum (Rs.in Lacs)
1.	Air Emission Management <ul style="list-style-type: none"> <li>• ESPs</li> <li>• Fume extraction systems with Bag filters</li> <li>• Dust Extraction systems with Bag filters</li> <li>• Chimneys</li> <li>• CAAQS</li> <li>• CEMS</li> <li>• Water Sprinklers</li> <li>• Environment Monitoring</li> </ul>	20.8	65.0
2.	Wastewater Management <ul style="list-style-type: none"> <li>• ETP</li> <li>• Settling ponds</li> <li>• Garland drains</li> <li>• Monitoring</li> </ul>	1.00	5.0
3.	Solid waste Management <ul style="list-style-type: none"> <li>• Ash handling system</li> <li>• Construction of Pucca Platform for storage</li> <li>• Hazardous &amp; Municipal solid waste storage</li> </ul>	3.0	20.0
4.	Greenbelt development, Land scaping Noise Management	0.20	4.0
5.	Occupational Health & Safety	1.00	6.0
<b>TOTAL</b>		<b>26.0</b>	<b>100.0</b>

# CHAPTER – 10

## ENVIRONMENTAL MANAGEMENT PLAN



### 10.1 INTRODUCTION

The major objective and benefit of utilising Environmental Impact Assessment in project planning stage itself, is to prevent avoidable losses of environmental resources and values as a result of Environmental Management. Environmental Management includes protection / mitigation / enhancement measures as well as suggesting post project monitoring programme. Environmental management may suggest revision of project site or operation, to avoid adverse impacts or more often additional project operations may have to be incorporated in the conventional operation.

The industrial development in the study area needs to be intertwined with judicious utilization of non-renewable resources of the study area and with in the limits of permissible assimilative capacity. The assimilative capacity of the study area is the maximum amount of pollution load that can be discharged in the environment without affecting the designated use and is governed by dilution, dispersion, and removal due to physico-chemical and biological processes. Environment Management Plan (EMP) is required to ensure sustainable development in the study area of the plant due to the proposed project. Hence it should be an all encompassive plan for which the proposed industry, Government, Regulating agencies like SPCB and more importantly, the affected population of the study area, need to extend their cooperation and contribution.

It has been evaluated that the study area will not be affected adversely and is likely to get new economical fillip. The affected environmental attributes in the region are air quality, water quality, soil, land use, ecology and public health.

The Management Action Plan aims at controlling pollution at the source level to the possible extent with the available and affordable technology followed by treatment measures before they are discharged.

Environmental Management aims at the preservation of ecosystem by considering the pollution abatement facilities at the plant since inception. In the upcoming modern integrated steel plants, pollution abatement has become an integral part of planning and design along with Techno economic factors.

## **10.2 MANAGEMENT DURING CONSTRUCTION PHASE [Gen. TOR # 10]**

Environmental pollution is inevitable during the construction phase. The project proponent will take appropriate steps to control pollution during construction phase. The following are the factors requiring control during construction phase.

### **10.2.1 SITE PREPARATION**

At the time of construction, there will be some quantity of soil and debris. The disturbed slopes shall be well stabilized before the on set of the monsoon. The leveling operation will also involve piling up of backfill materials. Use of dust suppressant spraying to minimize fugitive dust during construction activities is recommended.

### **10.2.2 WATER SUPPLY AND SANITATION**

The employees at the plant shall be provided with water for their requirement and for the construction activities. The proposed plant shall be provided with sufficient and suitable sanitary facilities to maintain proper standards of hygiene. These facilities would preferably be connected to a septic tank and shall be maintained properly to have least environmental impact.

### **10.2.3 NOISE**

Noise pollution is anticipated during the construction phase due to the usage of various construction equipment such as mechanical vibrator and mixers etc. The noise effect on the nearest inhabitations due to construction activity will be negligible.

However, as advised the onsite workers working near the noise generating equipments shall be provided with noise protection devices like earplugs.

### **10.2.4 MAINTENANCE OF VEHICLES**

One should be very careful in selecting the site for vehicle maintenance, so as to prevent the ground water contamination due to the spillage of oil. Both diesel and petrol engine vehicles

shall be maintained properly. Unauthorized dumping of waste oil will be prohibited. Wastes will be disposed off to the SPCB approved vendors.

**10.2.5 WASTE**

The solid waste shall be collected and disposed off as per norms.

**10.2.6 STORAGE OF HAZARDOUS MATERIAL**

The following hazardous materials need to be stored at the site during construction.

- a. Gas for welding purpose
- b. LDO
- c. Painting materials

All these materials would be stored as per international safety standards.

**10.2.7 LAND ENVIRONMENT**

The proposed project will not create any major impact on land environment. After the completion of construction activity, the surplus earth will be utilized to fill up low lying areas, the rubbish will be cleared and all in- built surfaces will be reinstated. Appropriate vegetation will be planned and all such areas shall be landscaped. **11.3 acres** of extensive greenbelt (inclusive of existing) will be developed within the premises.

**10.3 POST CONSTRUCTION PHASE**

**10.3.1 AIR EMISSION MANAGEMENT**

The following pollution control systems are proposed.

S.No.	Source	Control Equipment	Particulate emission at the outlet
1.	DRI kilns with WHRB's	Electro Static Precipitators (ESP)	< 50 mg/Nm <sup>3</sup>
2.	Induction Furnaces with CCM	Fume Extraction system with bag filters	< 50 mg/Nm <sup>3</sup>
3.	FBC Boiler	Electro Static Precipitator (ESP)	< 30 mg/Nm <sup>3</sup>

**Note :** Apart from the above Fume extraction system with bagfilters, dust suppression system, covered conveyers etc. will also be installed

The flue gases from the DRI kiln will pass through Waste Heat Recovery Boiler and after heat recovery the gases will be treated in High efficiency ESPs to bring down the particulate emission

in the exhaust gases to below 50 mg/Nm<sup>3</sup> and then discharged into the atmosphere through 2 no. of combined stacks each of 60 m height.

The Fugitive emissions from the Induction furnaces will be sucked through hoods and will pass through a fume extraction system with bag filters and then the treated gases will be discharged into the atmosphere through 3 nos. of stacks each of 30 m height for effective dispersion of emissions from Induction Furnaces. The outlet dust emission in the exhaust gases will be less than 50 mg/Nm<sup>3</sup>. The dust will be pneumatically carried to covered bins.

The emission from Producer gas plant will be treated in Cyclone separator to remove dust particles and Electric detarrer to separate the tar.

The flue gases from the FBC boiler will be treated in a high efficiency Electrostatic Precipitator to bring down the particulate emission to less than 30 mg/Nm<sup>3</sup> and will be discharged through a stack of 50 m height for effective dispersion of emissions into the atmosphere.

All the CREP recommendations will be implemented & followed strictly.

Good Housekeeping: Good housekeeping practices will be maintained in all sections of the plant.

**10.3.1.1 DUST EXTRACTION AND DUST SUPPRESSION SYSTEM**

The following are the details of dust extraction system & dust suppression system proposed in the plant.

S.No	Location	Pollution control system proposed
1.	<ul style="list-style-type: none"> <li>➤ Coal screen House</li> <li>➤ Crusher House</li> <li>➤ Junction houses and surge hopper</li> <li>➤ Iron ore screen house and bins</li> <li>➤ Product discharge</li> <li>➤ Junction House &amp; SMS bins</li> </ul>	These areas will be provided with Dust extraction systems - each comprising of pulse jet type bag filter, centrifugal fan and motor, duct work including suction hoods, duct supports, stack, dust hopper, rotary air lock valves etc.
2.	Junction houses and truck hoppers	Dust suppression system with plain water - comprising of spray nozzles, piping network, valves, pumps, instrumentation & controls, water tank etc.
3.	Stock piles in DR route	Dust suppression system with plain water - comprising piping network, valves, pumps, instrumentation & control, water tank etc.

**SOURCES OF AIR POLLUTION (DRI Kilns)**

S.No	AREA OF AIR POLLUTION	MEASURES ADOPTED FOR CONTROL
1.	Raw Material Handling	<ol style="list-style-type: none"> <li>1. All vibrating screens will be totally covered, to prevent the leakages of dust.</li> <li>2. Throughout the length, the conveyor is covered with G.I. Sheets to prevent the dust pollution</li> <li>3. All the material handling systems will be connected with de dusting system. All the discharge points and feed points wherever the possibility of dust generation is there, a de dusting suction point will be provided to collect the dust.</li> <li>4. <u>DUST SUPPRESSION SYSTEM</u> It is the most effective and successful system to prevent the fly-off of dust. Dust suppression system will be adopted to control the fugitive dust emanated during raw material unloading operations.</li> </ol>
2.	Raw Material Storage System	<ol style="list-style-type: none"> <li>1. All conveyors will be covered with G.I. Sheets to control the dust.</li> <li>2. All bins will be totally packed and covered, so that there will not be any chance of dust leakage. <ol style="list-style-type: none"> <li>i. Weigh feeders will be kept below the hopper and used to feed the known quantity of raw material per hour; it also seals the discharge area.</li> <li>ii. All discharge and feed points wherever the possibility of dust generation is there, will be provided with dust suppression system.</li> <li>iii. All material transfer points will be connected with dust suppression water nozzles to avoid the fugitive dust emission.</li> </ol> </li> </ol>
3.	Kiln Feed System	The raw material will be fed into the kiln through a double pendulum valve, which seals the false air entry into the rotary kiln and gas leakage from the kiln. The chute will be sealed with a double pendulum flap.
4.	Main Processing System Kiln	Sealed system to avoid false air entry as well as exit. So that the desired quality can be produced. Hence no dust escapes outside.
5.	Kiln Cooler Transfer Building	The transfer point between kiln to coolers is completely sealed to avoid the false air entry and gas leakages.
6.	Rotary Cooler	<ol style="list-style-type: none"> <li>1. The water will be circulated again and again. Hence there will not be any water pollution problem</li> <li>2. There will be slip seals at cooler inlet &amp; cooler outlet. The seals are also being lubricated to avoid false air entry and gas leakages.</li> </ol>

S.No	AREA OF AIR POLLUTION	MEASURES ADOPTED FOR CONTROL
		3. Cooler discharge and feed points wherever the possibility of dust generation is there, will be provided with de dusting system.
7.	Waste Gas Cleaning System	<p><b><u>AFTER BURNING CHAMBER (POST COMBUSTION CHAMBER)</u></b>  The waste gas passes through the after burning chamber where the combustion of carbon monoxide and un burnt carbon takes place in presence of air supplied. The basic purpose of after burning chamber is to reduce the carbon monoxide content in waste flue gases.</p> <p><b><u>ELECTRO STATIC PRECIPITATOR</u></b>  The flue gas from DRI kilns, after heat recovery, will pass through an electro static precipitator where it is cleaned to contain &lt; 50 mg/Nm<sup>3</sup> particulate matter. The clean gas will be emitted into the atmosphere through the chimney whose height is calculated on the basis of CPCB guidelines. The total conveying of gas from kiln to chimney is done by the induced draft fan located between ESP and chimney.</p>
8.	Product Separation System	<ol style="list-style-type: none"> <li>1. All conveyors will be covered with G.I. Sheets, to control the dust emission.</li> <li>2. All bins will be totally packed and covered, so that there will not be any chance for dust leakage.</li> <li>3. Telescopic chutes will be provided below the hopper to discharge the product directly into the truck for dispatch to avoid the pollution.</li> <li>4. All the above material handling system will be connected with de-dusting system</li> <li>5. All discharge points and feed points wherever the possibility of dust generation is there, a de-dusting suction point will be provided to collect the dust.</li> <li>6. The collected dust will be taken by pneumatic conveying system and stored in a dust storage bin.</li> <li>7. <u>Bag housing system</u>  In the bag house, the dry dust will be collected in an enclosed housing containing fabric filter bags which are suspended inside the unit. The dust laden air will pass through bag filters forming a dust cake to separate the particulate from the clean air.  The collected dust will be taken by a pneumatic conveying system and stored in a dust storage bin.</li> </ol>

**10.3.1.2 TECHNICAL SPECIFICATIONS OF CONTROL SYSTEMS**

**10.3.1.2.1 TECHNICAL SPECIFICATIONS OF ELECTROSTATIC PRECIPITATOR (ESP)**

**a) For Waste Heat Recovery Boilers (WHRB) - 4 x 100 TPD DRI Kilns**

S.No.	Parameters	Value
1	No. of ESP's	4
2	Gas flow rate per kiln, m <sup>3</sup> /hour	72,000
3	Flue gas temperature (°C)	170
4	Inlet dust concentration, gm/Nm <sup>3</sup>	21
5	Guaranteed outlet dust Concentration, mg/Nm <sup>3</sup>	< 50
6	Design pressure, mm wc	+/- 300
7	Number of fields	Three
8	Pressure drop across the ESP, mm wg	25 (max)
9	Collection efficiency	99.76 %

**b) For FBC Boiler**

S.No.	Parameter	Value
1.	Gas flow rate, m <sup>3</sup> /hr	95,426
2.	Flue gas temperature (°C)	170
3.	Inlet dust concentration, gm/nm <sup>3</sup>	45
4.	Guaranteed outlet dust Concentration, mg/nm <sup>3</sup>	< 30 (at max. flow conditions)
5.	Design pressure, mm wg	300
6.	Number of fields	Three
7.	Pressure drop across the ESP, mm wg	25 (max)
8.	Collection efficiency	99.92 %

**10.3.1.2.2 TECHNICAL SPECIFICATIONS OF BAGFILTER (TO INDUCTION FURNACE)**

S.No.	Parameter	Value
1.	Capacity of Bag Filter (m <sup>3</sup> /hr)	42,500
2.	Operating Temperature (°C)	100°C
3.	Size of Each Bag	φ 160 x 4880 mm long
4.	No. of Modules	1 No.
5.	Total No. of Bags	150 Nos.
6.	Total filtering Area (m <sup>2</sup> )	342
7.	Air To Cloth Ratio	1.4
8.	Pressure drop (mm WG.)	125 to 150
9.	Bag Material	500 gm/m <sup>2</sup>

S.No.	Parameter	Value
		Non-woven polyester needle felt
10.	Compressed air reqd. at 7 kg/cm <sup>2</sup>	338 ( FAD AT 6 Kg / cm <sup>2</sup> )
11.	No. of Solenoid Cum Diaphragm Pulse Valves 40 NB (1½") x 24 v D.C.	12 Nos.
12.	Type & Qty of Sequential Timer	12 Channel Electronic Sequential Controller -240 volt A.C. Supply
13.	Dust Disposal Arrangement	Through Rotary Air Lock Valves
14.	Rated Speed	20 RPM
15.	Type of Drive	Direct Drive Through Flexible Coupling
16.	Geared Motor Rating	0.37 KW / 20 rpm
17.	Material of Construction:	
a)	Raw Gas Casing	3.15 mm thk. MS sheet
b)	Clean Gas Casing	3.15 mm thk. MS sheet
c)	Hopper	3.15 mm thk. MS sheet
d)	Cage Plate	4 mm thk. MS sheet
e)	Diffuser at inlet	To be Provided
f)	Cage	MS
g)	Venturies	MS
18.	Guaranteed Emission Level	Less than 50 mg / Nm <sup>3</sup>

### 10.3.2 ACTION PLAN FOR CONTROL AND MONITORING OF FUGITIVE EMISSIONS

#### 10.3.2.1 CONTROL OF FUGITIVE EMISSIONS FROM SPONGE IRON PLANT

Fugitive dust emissions are likely in the unloading areas, material transfer point, cooler discharge area, product separation area, etc. Fugitive emission in the material unloading area can be avoided by providing dust suppression system. Fugitive emission from material unloading operations, material transfer points will be controlled fully with total enclosure and all the transfer emission will be connected with extractor inlet point and will pass through a high efficiency Bag Filter before discharging into the atmosphere. All internal roads will be asphalted.

#### 10.3.2.2 MONITORING OF SECONDARY FUGITIVE EMISSIONS

##### Sponge Iron plant

As per MoEF notification vide no. G.S.R. 414 (E) dated 30<sup>th</sup> May 2008, fugitive emissions will be monitored at a distance 10 m from their source as per following:

S.No	Area	Monitoring Location
1.	Raw material handling area	Screen area, Transfer Points, Stock Bin area
2.	Crusher area	Crushing plant, vibrating screen, transfer points

3.	Raw material feed area	Feeder area, Mixing area, transfer points
4.	Cooler discharge area	Over size discharge area, Transfer Points
5.	Product processing area	Intermediate stock bin area. Screening plant, Magnetic Separation unit, Transfer Points, Over size discharge area, Product separation area, Bagging area
6.	Other areas	Areas as specified by State Pollution Control Board

The fugitive emissions will be maintained below the MoEF&CC norm of 2000  $\mu\text{g}/\text{m}^3$ .

#### **10.3.2.3 DUST SUPPRESSION SYSTEM**

Water sprinklers will be provided at the unloading areas of the raw materials for dust suppression. Dust suppression system will be provided with plain water - comprising of piping network, valves, pumps, instrumentation & control, water tank etc.

#### **10.3.2.4 INTERNAL ROADS**

All internal roads will be asphalted to prevent the fugitive dust emission due to vehicular movement.

#### **10.3.2.5 INTERLOCKING SYSTEM**

All ESPs will have interlocking system. Whenever the ESP fails, there will be no production in the unit till the ESP is rectified.

#### **10.3.3 COMPLIANCE ON CREP RECOMMENDATIONS**

All the CREP recommendations will be implemented & followed strictly. The following will be the compliance of CREP recommendations.

- Continuous stack monitoring system is proposed for stack attached to WHRB & FBC Boiler.
- Online Ambient Air Quality Monitoring Stations will be established in consultation with SPCB during operation of the plant.
- Fugitive emission monitoring will be carried out as per CPCB norms.
- Energy meters will be installed for all the pollution control systems.
- Rain water harvesting pits are being constructed in consultation with CGWB.

#### **Recommendations**

- a) The proposed air pollution control equipment will be installed prior to commissioning of the plant.

- b) Pressure drop measuring system will be installed to measure the pressure drop across the bag filters.
- c) All the internal roads shall be asphalted to reduce the fugitive dust due to truck movement.

#### **10.3.4 WASTEWATER MANAGEMENT**

- There will not be any effluent generation from the DRI plant, SMS & Rolling Mill as closed circuit cooling system will be followed.
- The effluent generated will be in the form of Cooling Tower blowdown, Boiler blow down, D.M. Plant regeneration water and sanitary water.
- Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development.
- Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench.

#### **EFFLUENT TREATMENT PLANT**

pH of the boiler blowdown will be between 9.5 to 10.5. Hence a neutralization tank will be constructed for neutralizing the boiler blow down. DM plant regeneration water will be neutralized in a neutralization tank. After neutralization, these two effluent streams will be mixed with Cooling Tower blowdown in a Central Monitoring Basin (CMB). Service water will be treated in an oil separator and after treatment it will be taken to CMB. The treated effluent will be utilized for dust suppression, ash conditioning and for Green belt development. No effluent will be let out of the plant premises. Hence Zero discharge concept will be implemented. Sanitary waste water will be treated in Septic tank followed by sub-surface dispersion trench.

The following will be treated combined effluent characteristics.

○ pH	-	6.5 - 8.5
○ TSS	-	< 100 mg/l
○ Oil & Grease	-	< 10 mg/l
○ Free available chlorine	-	< 1.0 mg/l
○ Copper	-	<1.0 mg/l
○ Iron	-	< 1.0 mg/l
○ Zinc	-	< 1.0 mg/l
○ Chromium	-	< 0.2 mg/l
○ Phosphates	-	< 5.0 mg/l

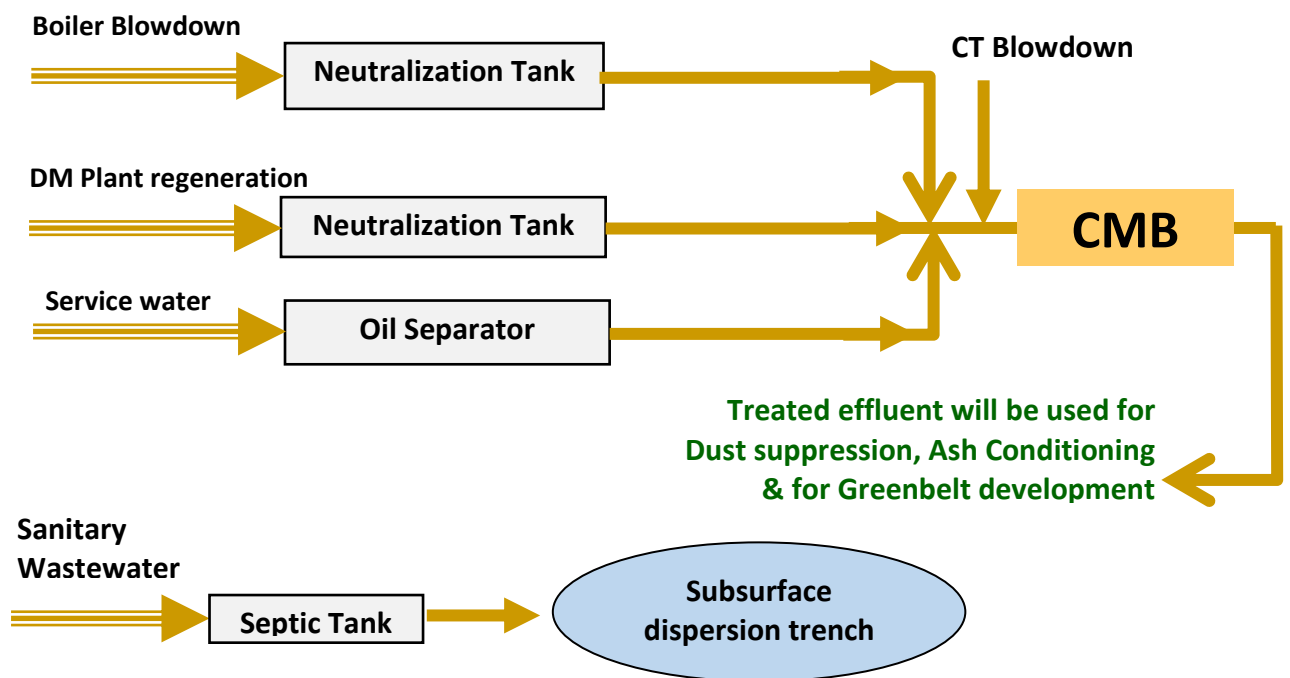
**TREATED EFFLUENT DISPOSAL**

<b>Total effluent generation from project</b> (Excluding sanitary waste)	:	<b>76 m<sup>3</sup>/day</b>
Effluent quantity to be used for ash conditioning	:	30 m <sup>3</sup> /day
Effluent to be used for dust suppression in CHP	:	10 m <sup>3</sup> /day
Balance effluent to be used for Greenbelt development	:	36 m <sup>3</sup> /day

**11.3 Acres** of greenbelt will be developed within the plant premises by using the treated effluent. A dedicated pipe distribution network will be provided for using the treated effluent for greenbelt development.

The characteristics of the treated effluent will comply with the SPCB Standards for onland irrigation. Hence there will not be any adverse impact on ground water / surface water due to the proposed project.

**Effluent Treatment Plant Flow Diagram**



**Fig: 10.1**

**10.3.5 SOLID WASTE GENERATION & ITS DISPOSAL**

The following will be the solid waste generation & proposed method of disposal.

S.No	Waste / By product	Quantity (TPA)	Method of disposal
1	Ash from DRI	21,600	Will be given to Cement Plant
2	DoloChar	36,000	Will be utilized in FBC boiler as fuel
3	Wet scrapper sludge	54,540	Will be given to brick manufacturers.
4	Kiln Accretion Slag	12,720	Will be used in road construction
5	Slag from SMS	13,500	Slag will be crushed and after recovery of iron, it will be used for road construction/given to brick manufacturers..
6	Mill Scale from Rolling Mill	4,500	Will be reused in SMS
7	Ash from Power Plant (with Indian coal)	22,680	Will be given to Cement Plant
8	Ash from Power Plant (with Imported coal)	5,376	Will be given to Cement Plant
9	Ash from Power Plant (with Indian coal + Dolochar)	36,180	Will be given to Cement Plant
10	Ash from Power Plant (with Imported coal + Dolochar)	25,056	Will be given to Cement Plant
11	Tar (from Producer gas plant)	576	Will be sold to authorized vendors
12	Ash (from Producer gas plant)	3600	Will be given to Cement plant

Letter for Expression of Interest for utilization of flyash by Cement plant is enclosed as Annexure- 6.

**NOTE:**

Solid wastes such as dolochar, accretion slag, granulated slag will be stored in designated storage yard. Ash generated will be stored in silos only. There will not be any open storage of fly ash .

However upon commencement of production, TCLP will be conducted and disposal of slag will be in accordance with the MOEF/CPCB/CECB norms. Composition of SMS Slag & Mill Scales are given below.

**Typical slag composition (mg/kg)**

SL No.	Element	SMS Slag
1	Al	1.6
2	Cr (III)	760
3	Mo	26
4	Pb	24
5	Cd	< 0.3
6	Ni	83
7	Co	14
8	V	634
9	Be	2.6
10	Ba	30
11	Sr	147
12	Sn	< 3.3
13	Sb	144

**Hazardous waste generation, storage & disposal**

**1. Waste oil: 0.5 KL / Annum**

This will be stored in covered HDPE drums in a designated area and will be given to SPCB approved vendors.

**2. Used Batteries**

Used batteries will be given back to the supplier under buy back agreement with supplier.

**MUNICIPAL SOLID WASTE GENERATION & ITS DISPOSAL**

Type of Municipal solid waste	Proposed method of disposal
Construction debris (generated during construction phase)	Used for landfill within the plant site to the extent possible and recyclables will be given to authorised recyclers.
Canteen waste	Used in composting / Vermiculture Used as manure for greenbelt development within the premises.
Recyclables	Given to SPCB authorised dealers

### **10.3.6 NOISE LEVEL MANAGEMENT**

The major noise generating sources in the plant are Turbines, Boilers, DG set & Compressors. All equipments will be of internationally reputed make and the same will be manufactured in accordance of the MOEF&CC, OSHA & other international guidelines by the supplier. Acoustic enclosure will be provided to Turbines. Silencers will be provided to DG set. The major noise levels will be confined to the working zones of the plant. The  $L_{eq}$  of eight hours will be within the prescribed standards. Community noise levels are not likely to be effected due to the proposed thick green belt and attenuation due to the physical barriers. The ambient noise levels will be less than 75 dBA during day time & less than 70 dBA during night time. Hence there will not be any adverse impact on habitations due to the proposed activities.

#### **Recommendations**

- a) Acoustic enclosures to turbines.
- b) The impact can be reduced by adopting shock absorbing techniques.
- c) The Noise absorption will improve by using hollow concrete blocks in the construction of the proposed Plant.
- d) Ear plugs shall be provided to the workers and this shall be enforced strictly.
- e) Extensive greenbelt shall be developed for further attenuating the noise levels.

### **10.3.7 LAND ENVIRONMENT**

All the required Air Emission Control systems will be provided in the proposed activities. The treated effluent will confirm to the SPCB's standards for onland irrigation. Hence there will not be any impact on land environment due to the proposed plant. The solid waste generated from the project will be reused / disposed as per norms. Hence there will not be any adverse impact on land environment due to the solid waste generated from the proposed activities. Extensive greenbelt development will have positive impact on land environment.

#### **Recommendations**

Landscaping can be done around the Administrative building, raw material storage sheds etc. This will help in preserving the ecological conditions.

### **10.3.8. MEASURES FOR IMPROVEMENT OF ECOLOGY**

There are no National Parks, Wild life sanctuaries, Bird sanctuaries within 10 Km. radius of the plant. No significant vegetation occurs in and around the project site. No significant fauna exists in the area. Hence there will not be any adverse impact on flora & fauna due to the proposed project.

#### **Recommendations**

Plantation programme should be undertaken at several areas. They should include plantation, along the internal and external roads and along the administrative buildings and the stacking yards.

People should be educated and trained in social forestry activities by local governmental and non-governmental organizations.

#### **10.3.8.1 GREEN BELT DEVELOPMENT [Gen. TOR # 7 (ix)]**

The greenbelt shall be developed simultaneously with the plant construction. This will further mitigate the pollution impacts. **5 to 45 m** wide greenbelt will be developed all around the plant as per CPCB guidelines in consultation with local DFO.

#### **Greenbelt plantation**

Greenbelt will be developed in a set of rows of trees planted in such a way that they form an effective barrier between the plant and the surroundings. The main purpose of greenbelt development is to contribute to the following factors.

- To maintain the ecological homeostatus.
- To attenuate the air emissions from the kiln and the fugitive dust emissions.
- To prevent the soil erosion.
- To attenuate the noise levels.

Plantation of grass, flowers, bushes and trees will be taken up to reduce the generation of dust from the bare earth and to enhance the aesthetic value.

#### **Plantation species**

Plantation species will be considered based on the following.

- Suitable to the Geo-climatic conditions of the area.

- Mix of round, spreading, oblong and conical canopies.
- Ever green trees.
- Different heights ranging from 4m to 20m.

#### **Plantation for arresting dust**

Trees particularly having compact branching closely arranged leaves of simple elliptical and hairy structure, shiny or waxy leaves and hairy twigs are efficient filters of dust. The following species are suggested to arrest the dust

- *Alstonia Scholaris*
- *Bauhinia purpurea*
- *Cassia siamea*
- *Peltoferrum ferrugineum*
- *Butea monosperma*
- *Tamarindus indica*
- *Azadirachta indica*

#### **Plantation to absorb SO<sub>2</sub> emissions**

The following plants are suggested for plantation to absorb SO<sub>2</sub> in the air.

- *Azadirachta indica*
- *Albizia lebbeck*
- *Alstonia scholaris*
- *Lagerstroemia flosregineae*
- *Melia azedarach*
- *Minusops elangi*
- *Poloyalthia longifloia*

#### **Plantation to reduce noise pollution**

Trees having thick and flushy leaves with petioles are suitable. Heavier branches and trunks of trees also deflect the sound waves. The following plant species are suggested to reduce noise pollution.

- *Alstonia scholaris*
- *Azadirachta indica*

- *Melia monosperma*
- *Grevillea peridifolia*
- *Tamarindus indica*
- *Greavillea robusta*

**Plantation along the roads (Avenue plantation)**

- *Alstonia scholaris*
- *Cassia fistula*
- *Bauhinia purpurea*
- *Mimusops elangi*
- *Pongamia pinnata*
- *Polyalthia longifolia*
- *Poluferrum ferrugineum*
- *Lagerstroemia flosreginea*
- *Cassia siamea*

**GREENBELT DEVELOPMENT PLAN**

- Local DFO will be consulted in developing the green belt.
- Greenbelt of **11.3 acres** will be developed in the plant premises. **5 to 45 m** wide greenbelt will be developed all around the plant.
- The tree species to be selected for the plantation are pollutant tolerant, fast growing, wind firm, deep rooted. A three-tier plantation is proposed comprising of an outer most belt of taller trees which will act as barrier, middle core acting as air cleaner and the innermost core which may be termed as absorptive layer consisting of trees which are known to be particularly tolerant to pollutants.
- Greenbelt will be developed as per CPCB guidelines.
- 600 plants will be planted per acre as per CPCB norms.

### 10.3.9 RAINWATER HARVESTING [Gen.TOR # 7 (x)]

Rainwater harvesting structures will be constructed to harvest the run-off water from roof tops by laying a separate storm water drainage system for recharging of ground water.

Rain water harvesting structures will be provided in the plant to recharge the precious ground water. Rain harvesting pits will be constructed in consultation with Central Ground Water Board.

The following is the Plan for rain water harvesting measure at plant site.

Average annual rainfall = 1323 mm

Quantum of Rain water that can be harvested from the premises

- a) Average annual rainfall = 1.323 m
- b) Runoff co-efficient
  - Runoff co-efficient for Roof area = 90%
  - Runoff co-efficient for Roads and Paved area = 80%
  - Runoff co-efficient for Open area = 40%
  - Runoff co-efficient for Green belt area = 20%

#### Details of Rain water harvesting potential

S.No.	Type of area	Total Area (m <sup>2</sup> )	Runoff Co-efficient	Rainfall in m	Rainwater Collection Potential (m <sup>3</sup> )
1	Roof top area (60% of the total Builtup area)	23698	0.9	1.323	28217
2	Internal roads	6070	0.8	1.323	6424
3	Storage areas	31161	0.9	1.323	37103
4	Greenbelt	45730	0.2	1.323	12100
5	Water Reservoir & RWH	12140	1	1.323	16061
6	Parking area	4048	0.4	1.323	2142
	<b>Total</b>	<b>122847</b>			<b>102049</b>

The potential rain water that can be reused to meet the plant water requirement is 102049 m<sup>3</sup> / year. Accordingly the net water requirement will reduce by 340 cum/day.

#### 10.4 POST PROJECT MONITORING STRATEGY [Gen. TOR # 7 (xii)]

The monitoring of various environmental parameters is necessary which is part of the environmental protection measures. Monitoring is an important feature because the efficiency of control measures can only be determined by monitoring. A comprehensive monitoring programme is given here under. PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub> and NO<sub>x</sub> are monitored as per Ministry notification vide G.S.R. No. 826(E) dated 16<sup>th</sup> November, 2009.

Locations and frequency of monitoring as per the guidelines of SPCB and MOEF&CC are tabulated below.

#### MONITORING SCHEDULE FOR ENVIRONMENTAL PARAMETERS

S. No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
<b>1. Water quality</b>				
	Water quality in the area	Once in a month except for heavy metals which will be monitored on quarterly basis.	Grab sampling	As per IS: 10500
<b>2. Air Quality</b>				
A.	Stack Monitoring	Online monitors (WHRB, FBC boiler) Once in a month		PM SO <sub>2</sub> , NO <sub>x</sub> & CO
B.	Ambient Air quality (CAAQMS)	Continuous	Continuous	PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> & NO <sub>x</sub>
C.	Fugitive emissions	Once in a Month	8 hours	PM
<b>3. Meteorological Data</b>				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
<b>4. Noise level monitoring</b>				
	Ambient Noise levels	Once in a month	Continuous for 24 hours with 1 hour interval	Noise levels

#### Infrastructure for Environmental Protection

##### Man Power

The project proponent shall provide a fully equipped laboratory to carry out the analysis. The following manpower shall be provided on regular basis.

**Environmental Engineer / Safety Officer**

He will be a graduate engineer with adequate experience, responsible for implementing and monitoring the environmental impacts and all the safety aspects. He will act as a liaison officer between the proposed plant and regulatory agencies like SPCB, CPCB etc.

**Chemist**

He will be a qualified chemist to carry out the analysis of various samples.

**Monitoring equipment and Consumables**

Environmental monitoring during the operation phase of the plant will be entrusted to a third party. Monitoring will be carried out as per CPCB/SPCB norms. A budgetary allocation of Rs. 14.1 Lakhs has been earmarked for Environmental monitoring.

**Noise levels**

A sound level meter shall be purchased to record noise levels in different scales like A, B and C with slow and fast response options at various generating source from D.G set which will be used only when there is an interruption in the power supply of State Electricity Board.

**10.5 COSTS FOR ENVIRONMENTAL PROTECTION [Gen. TOR # 7 (xi)]**

Capital Cost for Environment Protection for proposed plant : Rs. 26 Crores

Recurring Cost per annum for Environmental protection : Rs.100 Lakhs

**BREAK-UP OF BUDGET FOR ENVIRONMENTAL PROTECTION MEASURES**

S.No	Item	Capital Cost (Rs.in Crores)	Recurring Cost / Annum (Rs.in Lacs)
1.	Air Emission Management <ul style="list-style-type: none"><li>• ESPs</li><li>• Fume extraction systems with Bag filters</li><li>• Dust Extraction systems with Bag filters</li><li>• Chimneys</li><li>• CAAQS</li><li>• CEMS</li><li>• Water Sprinklers</li><li>• Environment Monitoring</li></ul>	20.8	65.0
2.	Wastewater Management	1.00	5.0

	<ul style="list-style-type: none"> <li>• ETP</li> <li>• Settling ponds</li> <li>• Garland drains</li> <li>• Monitoring</li> </ul>		
3.	Solid waste Management <ul style="list-style-type: none"> <li>• Ash handling system</li> <li>• Construction of Pucca Platform for storage</li> <li>• Hazardous &amp; Municipal solid waste storage</li> </ul>	3.0	20.0
4.	Greenbelt development, Land scaping Noise Management	0.20	4.0
5.	Occupational Health & Safety	1.00	6.0
<b>TOTAL</b>		<b>26.0</b>	<b>100.0</b>

## CHAPTER – 11

### SUMMARY & CONCLUSION

#### i. Project name and location

Name of the project : Vikas Metaliks and Energy Limited  
Location of the Plant : Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh

#### ii. Products and Production capacities

The proposed Steel Plant envisages manufacturing of the following products

S.No.	Details		Plant Configuration	Production Capacity
1.	DRI Kilns		4 x 100 TPD	1,20,000 TPA
2.	Induction furnace with CCM & LRF		3 x 15 MT/heat	1,35,000 TPA
3.	Rolling Mill		1 x 300 TPD	90,000 TPA
4.	Power Generation	WHRB	4 x 2 MW	8 MW
		FBC Boiler (40 TPH)	---	8 MW

#### iii. Requirement of land, raw material, water, power, fuel

##### a) Total land Requirement

The proposed project will be taken up in an area of 34.26 acres / 13.86 Ha. The Khasra nos. of the project site are 149/5, 6, 8, 9, 10, 15, 16, 20, 21, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 158/1, 158/3, 180, 181/3, 215, 217/3.

##### b). Raw Material & Fuel requirement for the Proposed Project

The following will be the raw material requirement for the proposed project:

Raw Material		Quantity	Sources	Mode of Transport
<b>For DRI Kilns (Sponge Iron)</b>				
Iron ore		1,92,000	NMDC, Bailadila/ Bachheli & Open Market	By rail & road (through covered trucks)
Coal	Indian	1,56,000	SECL, Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)

Raw Material		Quantity	Sources	Mode of Transport
	Imported	1,11,000	Indonesia / South Africa / Australia	Through sea route, rail route & by road
Dolomite		6,600	Local area	By road (through covered trucks)
Limestone		9,000	Local area	By road (through covered trucks)
<b>For Induction Furnace (MS Billets)</b>				
Sponge Iron		1,20,000	In plant generation	By Road (through covered trucks)
Scrap		35,600	Local area	By road (through covered trucks)
Ferro Alloys		1,350	Local area	By road (through covered trucks)
<b>For Rolling Mill (TMT bars &amp; Structural Steel)</b>				
M.S. Ingots / Steel billets		99,000	In plant generation	through conveyors
Furnace oil		4950	HPCL/IOCL depots	Tankers
Coal		24,000	SECL, C.G. / MCL Odisha / Imported	By rail & road (through covered trucks)
Producer gas		8000 Nm <sup>3</sup> /hr	In plant generation	---
<b>For FBC Boiler [Power Generation 8 MW]</b>				
Dolochar		36,000	In plant generation	through covered conveyors
Coal	Indian	50,400	SECL C.G. / MCL Odisha	By rail & road (through covered trucks)
	Imported	35,840	Indonesia / South Africa / Australia	Through sea route / rail route / by road

**c) Water Requirement**

The water requirement for the proposed project will be 450 KLD. This includes Make-up water for DRI Kiln, Induction Furnace, Rolling Mill, Power Plant. Water required for the proposed project will be sourced from Ground Water. Ground Water drawl permission from CGWA has been obtained NOC no. CGWA/NOC/IND/ORIG/2018/3370. Letter is yet to be issued. Air cooled condensers will be provided to FBC boiler. Hence the net water requirement will be substantially reduced.

The following is the break-up of the water requirement for proposed project.

**WATER REQUIREMENT**

S.No.	Water requirement	Quantity in KLD
1.	DRI kiln	110
2.	Steel melting shop	100

3.	Rolling mill	25
4.	Power Plant (16 MW)	
	Cooling tower makeup	96
	Boiler make up	74
	DM plant Regeneration	30
5.	Domestic	15
	<b>Total</b>	<b>450</b>

**d) Power Requirement**

Power required for the proposed steel plant will be 18.6 MW and it will be sourced from 16 MW Captive power plant and remaining power of 2.6 MW will be sourced from State Grid.

**iii. Process description**

**a) Sponge Iron (DRI)**

Refractory lined rotary kilns will be used for reduction of iron ore in solid state. A central Burner located at the discharge end will be used for initial heating of the kiln.

Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000<sup>0</sup>C enters the reduction zone. Temperature of the order of 1050<sup>0</sup>C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

This hot material will be transferred to Heat exchanger. In Heat exchanger the material will be cooled to 160<sup>0</sup>C. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through magnetic separators and stored in separate bins. The hot flue gases will be taken to a Waste Heat Recovery Boilers and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.

**b) Steel Melting Shop**

In Steel Melting Shop (SMS), Sponge Iron will be melted along with melting scrap and fluxes to make pure liquid steel and then to mould it in required size billets. The SMS will consist of Induction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). There will be 3 nos. of Induction Furnaces in the SMS plant, each of 15T capacity. MS Ingots/ MS Billets will be produced in Continuous Casting Machine.

**c) Rolling Mill**

In the proposed project, there will 1 X 300 TPD reheating furnaces is proposed for the heating of billets. Furnace will be heated with Producer Gas / Furnace oil. A bar and round mill will be installed in the plant to produce 300 TPD of TMT bars/ Structural steel.

**d) Power generation through WHRB Boiler**

The hot flue gases from DRI kilns will pass through waste heat recovery Boilers to recover the heat and to generate 1 x 8 MW electricity. The gases after heat recovery will pass through ESPs and then discharged through chimneys into the atmosphere for effective dispersion of emissions into the atmosphere.

**e) Power generation though FBC Boiler**

Coal (Imported / Indian) and dolochar will be used in FBC Boilers to generate 8 MW electricity. The flue-gases will be treated in high efficiency ESP and then discharged through stack into the atmosphere.

**Emissions from proposed project**

S.No.	Stack attached to	PM (g/s)	SO <sub>2</sub> (g/s)	NOx (g/s)
1.	DRI kiln with WHRB (2 x 100 TPD)	0.9 (per flue)	30 (per flue)	1.8 (per flue)
2.	DRI kiln with WHRB (2 x 100 TPD)	0.9 (per flue)	30 (per flue)	1.8 (per flue)
3.	Induction Furnace (3 x 15 T)	0.5 (per stack)	---	1.0 (per stack)
4.	Rolling Mill (1 x 300 TPD)	0.4	15.3	0.8
5.	AFBC Boiler * (40 TPH Boiler)	0.5	1.8	1.8

**Effluent generation**

There will be no effluent generation in the DRI plant, Induction Furnace & Rolling mill as closed circuit cooling system will be adopted. Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench. The following will be the total wastewater & it's break-up.

**WASTEWATER BREAKUP**

S.No.	Source	Generation (KLD)
1.	Power Plant	
	a) Cooling Tower blowdown	24
	b) Boilers blowdown	22
	c) D.M. plant regeneration water	30
2.	Sanitary Wastewater	12
	<b>Total</b>	<b>88</b>

**Solid & Hazardous waste generation**

S.No	Waste / By product	Quantity (TPA)	Method of disposal
1.	Ash from DRI	21,600	Will be used in own brick manufacturing unit and remaining quantity will be given to other brick manufacturers.
2.	DoloChar	36,000	Will be utilized in FBC boiler as fuel
3.	Wet scrapper sludge	54,540	Will be given to other brick manufacturers.
4.	Kiln Accretion Slag	12,720	Will be used in road construction

5.	Slag from SMS	13,500	Slag will be crushed and after recovery of iron, it will be used for road construction.
6.	Mill Scale from Rolling Mill	4,500	Will be reused in SMS
7.	Ash from Power Plant (with Indian coal)	22,680	Will be given to Cement Plants & Brick manufacturers.
8.	Ash from Power Plant (with Imported coal)	5,376	Will be given to Cement Plants & Brick manufacturers.
9.	Ash from Power Plant (with Indian coal + Dolochar)	36,180	Will be given to Cement Plants & Brick manufacturers.
10.	Ash from Power Plant (with Imported coal + Dolochar)	25,056	Will be given to Cement Plants & Brick manufacturers.
11.	Tar (from Producer gas plant)	576	Will be given to Coal tar distillation units
12.	Ash (from Producer gas plant)	3600	Will be given to Cement plant

**Material balance**

**(A) SPONGE IRON UNIT [4 x 100 TPD DRI Kilns]**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity (TPA)
1.	Iron Ore	1,92,000	Sponge Iron	1,20,000
2.	Coal (Indian)	1,56,000	Dolochar	36,000
3.	Dolomite	6,600	Flue Gases	1,18,740
4.	Limestone	9,000	Ash / Dust from Bag filters	21,600
5.			Wet Scraper sludge	54,540
6.			Accretion slag	12,720
	<b>Total</b>	<b>3,63,600</b>	<b>Total</b>	<b>3,63,600</b>

**(B) INDUCTION FURNACE (3 x 15 MT)**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity (TPA)
1.	Sponge Iron	1,20,000	MS Billets / Ingots	1,35,000
2.	MS Scrap	35,600	Slag	13,500
3.	Ferro Alloys	1,350	Flue Gases	8,450
	<b>Total</b>	<b>1,56,950</b>	<b>Total</b>	<b>1,56,950</b>

**(C) ROLLING MILL**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity (TPA)
1.	M.S. Ingots /	99,000	Rolled Products	90,000

	Steel billets			
			Mill scales	4,500
			Gases	4,500
	<b>Total</b>	<b>99,000</b>	<b>Total</b>	<b>99,000</b>

**(D) POWER PLANT [8 MW]**

**With 100 % Indian Coal**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity
1.	Coal (Indian)	50,400	Electricity	8 MW
2.			Ash	22,680 TPA
			Gases including dust	27,720 TPA
	<b>Total</b>	<b>50,400</b>	<b>Total</b>	<b>50,400 TPA</b>

Note: Ash in Indian coal is considered Max. of 45%

**With 100 % Imported Coal**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity
1.	Coal (Imported)	35,840	Electricity	8 MW
2.			Ash	5,376 TPA
			Gases	30,464 TPA
	<b>Total</b>	<b>35,840</b>	<b>Total</b>	<b>35,840 TPA</b>

Note: Ash in Imported coal is considered Max. of 15%

**Indian Coal with combination of Dolochar**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity
1.	Coal (Indian)	32,400	Electricity	8 MW
2.	Dolochar	36,000	Ash	36,180 TPA
			Gases including dust	18,280 TPA
	<b>Total</b>	<b>54,460</b>	<b>Total</b>	<b>54,460 TPA</b>

Note: Percentage of Ash in Indian coal is considered as 45% & 60 % in Dolochar

**Imported Coal with combination of Dolochar**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity
3.	Coal (Imported)	23,040	Electricity	8 MW
4.	Dolochar	36,000	Ash	25,056 TPA
			Gases	33,984 TPA
	<b>Total</b>	<b>59,040</b>	<b>Total</b>	<b>59,040 TPA</b>

Note: Ash in Imported coal is considered as 15% & 60 % in Dolochar

## **v. Measures for mitigating the impact on the environment**

### **a. Impact due to Air emission on the Environment & on nearest habitation**

- The flue gases from the DRI kilns will pass through Waste Heat Recovery Boiler and after heat recovery the gases will be treated in High efficiency ESP and then discharged into the atmosphere through **2 no. of combined stacks** each of **71 m** height attached to **each 2 x 100 TPD kilns**, to bring down the particulate emission in the exhaust gases to below **50 mg/Nm<sup>3</sup>**.
- The Fugitive emissions from the Induction furnaces will be sucked through hoods and will pass through a fume extraction system with bag filters and then the treated gases will be discharged into the atmosphere through **3 no. of stacks each of 30 m height** for effective dispersion of emissions from Induction Furnaces. The outlet dust emission in the exhaust gases will be less than **50 mg/Nm<sup>3</sup>**. The dust will be pneumatically carried to covered bins.
- The flue gases will be discharged into the atmosphere through a stack of **47 m** height for effective dispersion of emissions from Induction Furnaces.
- The Exhaust emissions from FBC Boiler will pass through a high efficiency ESP to bring down the particulate matter to less than **30 mg/Nm<sup>3</sup>** and will be let out into the atmosphere through a stack of **62 m** height for effective dispersion of emissions into the atmosphere.
- Energy meters will be provided to all air pollution control systems to ensure effective operation of the control systems.
- Fugitive emissions will be monitored as per CPCB norms.
- All air emission control systems will be taken-up for maintenance as per prescribed schedule and compliance with norms will always be ensured.
- Stack monitoring and Ambient air quality checks at regular interval by SPCB will also help in cross checking the performance of Pollution control systems installed in the plant.

**Hence there will not be any adverse impact on Near by village due to the proposed project.**

**b. Wastewater Treatment / disposal proposed**

There will be no effluent generation in the DRI plant, Induction Furnace & Rolling mill as closed-circuit cooling system will be adopted. Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench.

**vi. Capital cost of the project, estimated time of completion**

The total capital investment of the proposed project is Rs. 125 Crores. The proposed project will be implemented in 24 months from the date of issue of Environmental Clearance.

**vii. Site Selection / Environment Setting within 10 Km. radius.**

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Uncultivated land
2.	National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	Nil
3.	Historical places / Places of Tourist importance / Archeological sites	Nil
4.	Critically polluted area as per MoEF&CC Office Memorandum dated 13 <sup>th</sup> January 2010	Nil
5.	Defence Installations	Nil
6.	Nearest village	Bartori – 0.4 Km.
7.	No. of Villages in the Study Area	50
8.	Nearest Hospital	Tilda – 5.4 Kms. (NNW)
9.	Nearest School	Tilda – 5.4 Kms. (NNW)
10.	Forests	Bilari RF (9.8 Kms.) No forest land is involved in the proposed project site.
11.	Water body	Jamuniya nala – 1.5 Kms. Mahanadi Bhatapara Branch Canal – 0.6 Kms. No River / Stream passes through the proposed project site.
12.	Nearest Highway	Nil

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
13.	Nearest Railway Station	Baikunth R S – 2.9 Kms

### viii. Baseline environmental data

#### Ambient air quality

Ambient air quality was monitored for PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub> & CO at 8 stations including project site during March 2017 to May 2017. The following are the concentrations of various parameters at the monitoring stations:

Parameter		Concentration
PM <sub>2.5</sub>	:	16.4 to 33.4 µg/m <sup>3</sup>
PM <sub>10</sub> *	:	28.9 to 58.5 µg/m <sup>3</sup>
SO <sub>2</sub>	:	7.2 to 14.5 µg/m <sup>3</sup>
NO <sub>x</sub>	:	7.0 to 18.9 µg/m <sup>3</sup>
CO	:	354 to 758 µg/m <sup>3</sup>

\* PAH in PM<sub>10</sub> were analyzed and their concentrations at all monitoring Stations are Below Detectable Level.

#### Water Quality

##### Surface Water Quality

There are no major rivers flowing within 10 Km. radius of the study area. Jamuniya nala is flowing at a distance of 1.5 Kms. However, there is no water available during the study period. Hence a sample from Kirna Tank (3.2 Kms.) & from Batapara Mahanadi Canal (0.7 Kms.) have been collected and analyzed for various parameters. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

##### Ground Water Quality

8 No. of ground water samples from open wells / bore wells were collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

#### Noise Levels

Noise levels were measured at 8 locations during day time & Night time. The noise levels at the monitoring stations are ranging from 39.25 dBA to 59.10 dBA.

**ix. Identification of hazards**

Equipment	Process	Potential Hazard	Provision
<b>DRI PLANT</b>			
Sponge Iron Kiln	Reduction of Iron Ore	Falling of Hot Mass & Dust	<ul style="list-style-type: none"> <li>• Ensuring before opening the kiln bottom door, first clean the inner surface of the stack cap, such that the dust particle and hard clinkers which deposited in the cap is fallen into the DSC.</li> <li>• Ensure before opening the DSC bottom door to check the DSC bar position and condition and to clean if big block of castables or any hard clinkers which is blocking the dust flow passage to wet scrapper chute.</li> <li>• Ensure to clean the dust by opening the man hole provided in the chute and check the spiking rods and the screen. In built safety system is provided in the construction of furnace with suitable refractory walls.</li> <li>• Allow the wet scrapper to run to remove the sludge, then open the drain pipe of the wet scrapper, which is located at bottom on either side, pour sufficient water to clean the sludge and the slurry dust to flow through drain pipe.</li> <li>• Ensure to stop the wet scrapper and open the top plate to check the alignment, weak and tear of the plates and take necessary precaution against the excessive worn out plate.</li> </ul>
Sponge Iron Kiln	Reduction of Iron Ore	Air emission	<ul style="list-style-type: none"> <li>• Adequately designed ESP and other Air Pollution control systems will be provided with internal lock to the kiln feeding system in order to prevent by passing of emissions through safety cap and also during non operation of ESP or any other pollution control devices.</li> </ul>
<b>POWER PLANT</b>			
Turbine	Convert pressure in the flue gas into Mechanical Energy	Mechanical & Fire Hazards Noise	<ul style="list-style-type: none"> <li>• Layout of Equipment / Machinery will be in accordance to factory and electrical inspectorate.</li> <li>• Acoustic enclosure to Turbine</li> </ul>
Generator	Convert	Mechanical & Fire	<ul style="list-style-type: none"> <li>• Layout of Equipment / Machinery will be in</li> </ul>

Equipment	Process	Potential Hazard	Provision
	Mechanical energy into electrical energy	Hazards a) Lube Oil System b) Cable galleries c) Short circuits	accordance to factory and electrical inspectorate.
		Noise	<ul style="list-style-type: none"> <li>• Acoustic enclosure</li> <li>• Isolated panel rooms</li> <li>• Special foundation with vibration absorbers</li> </ul>
Power Transformers	50,000 KVA capacity	Fire and explosion	Automatic fire fighting system will be provided. Isolated with fencing and restricted entry.
Switch Yard	transformer	Fire	All electrical fittings and cables are provided as per the specified standards.
Switch Yard control room		Fire in cable galleries and switch	
Coal storage shed	Storage of coal for 10 days requirement.	Fire and spontaneous combustion	Coal storage yard will be continuously sprinkled with water with garden type sprinklers.
Coal handling bunkers	----	Fire and dust explosions	Continuous water sprinkling
Compressor House	Plant operation	Governor failure due to the failure of pins and springs leading to opening of safety valves	The design precautions of safety will be followed in manufacture and erection of compressors.
Coal storage yard	Coal dust is combustible	Explosion Hazard	<ul style="list-style-type: none"> <li>• Coal storage shall be minimised</li> <li>• Coal piles shall not be located above heat sources such as steam lines.</li> <li>• motors.</li> <li>• All mechanical &amp; electrical equipment inside the coal storage area shall be approved for use in hazardous locations and provided with spark proof</li> </ul>
STG, draft fans, soot blowing from boiler, ventilation pipes	Noise generated due to operation of STG, working of fans, ventilation system,	Noise hazard	<ul style="list-style-type: none"> <li>• Acoustic enclosures will be provided to STG.</li> <li>• Enclose fans, insulating ventilation pipes</li> <li>• use of dampeners.</li> </ul>
Failure of APCS	Dust / Smoke	Air emission	<ul style="list-style-type: none"> <li>• Interlocking system will be provided and whenever APCS is not working, then raw material feed will be stopped. Consequently</li> </ul>

Equipment	Process	Potential Hazard	Provision
			<p>there will be no production in the unit till APCS is rectified.</p> <ul style="list-style-type: none"> <li>• The unit cannot be stopped immediately and it will take some time to stop. During this period release of particulate matter will take place, hence mobile dust suppression system will be provided to suppress the particulate matter immediately to mitigate the impact of PM on surroundings.</li> <li>• Depending upon the wind direction at the time of emergency, Mobile dust suppression equipments will be provided to suppress the dust within the plant and also outside the plant to reduce the impact on habitation, water body, crops etc.</li> <li>• Immediately upon failure of any APCS, emergency siren will be blown to inform the employees and nearby villagers about the emergency.</li> <li>• Dust masks will be provided to the employees and near by villagers. Immediately upon hearing siren, every employee and villager must wear the dust mask.</li> <li>• Mock drills will be conducted in the nearby villages for the emergency preparedness.</li> </ul>

#### **x. Impact of the project on air, water, land, flora-fauna and nearby population**

Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB / SPCB norms. All solid wastes will be disposed / utilized as per CPCB / SPCB norms. 11.3 Acres of greenbelt will be developed as per guidelines. Hence there will not be any adverse impact on land environment due to the proposed project.

#### **xi. Emergency preparedness plan**

As part of Emergency preparedness plan the following shall be taken care

- Communication systems (including Public Address System)
- Emergency Siren
- Transport for evacuation of plant personnel
- Providing proper Assembly area

- First Aid facility including ambulance at site
- Fire Fighting and rescue arrangements
- Security arrangements
- Breathing air sets and facilities for bottling of breathing air.
- Laboratory facilities
- Fire Alarm System –Heat & Smoke Detectors
- Fire Pump House

**xii. Issues raised during public hearing (if applicable) and response given**

**The followings compliances given by the Project proponent on the Issues raised by the people during Public hearing :-**

Sr. No.	Issues raised		Project Proponent Reply
i.	Agreement for employment	=	Agreed, priority will be given to local people as per their qualification and capabilities.
ii.	Minimum wages	=	Project Proponent has assured that rate of wages will be as per Government norms.
iii.	Pollution control measures	=	<p>The Project Proponent informed that it is proposed to install all the necessary Air Pollution Control devices as Electrostatic Precipitators in Sponge Iron Kilns, Bag Filter in Induction furnace and Electrostatic Precipitator in FBC based Power Plant. Water will be sprinkled for control of dust emanation.</p> <p>Closed cooling circuit will be implemented in Sponge Iron kilns, Induction furnaces and Rolling Mill, hence there will not be any effluent generation. However effluent from power plant will be treated in neutralization cum settling tanks and treated effluent will be reuse for horticulture purpose, dust suppression and ash conditioning within proposed</p>
			<p>premises only and no effluent will be letout the premises and ZERO discharge condition will be implemented.</p> <p style="text-align: right;"><i>Contd. ...</i></p>
iv.	Crop damage	=	<p>Regarding this, the Project Proponent informed that it is proposed to install Electrostatic Precipitators Sponge Iron Kilns, Bag Filter in Induction furnace and Electrostatic Precipitator in FBC based power Plant. Water will be sprinkled for control of dust emanation.</p> <p>Hence after implementation of these measures there will not be any possibility of crop damage.</p>
v.	Health and education	=	Education and health facilities to villagers will be provided under CSR.
vi.	15 feet wide road will be provided to villagers for their movements.	=	Agreed, Project proponent has informed that Company will provide 15 feet wide road closed to Rly. Lines for local villagers.

### **xiii. ESC activities with proposed expenditure**

Vikas Metaliks & Energy Limited will be actively contribute to improve the Socio-economic conditions of the area by providing assistance for local persons preferable from the nearby villages. The continuing commitment by business to behave ethically and contribute to economic development while improve the quality of life of workforce and their families as well as that of the local community and society at large.

#### **Details of expenditure for ESC activities**

Total cost of the proposed project	:	Rs. 125 Crores
Expenditure earmarked towards ESC condition)	:	2.5 % of project cost (as per TOR condition)
	:	Rs. 3.2 Crores

### **xiv. Occupational Health Measures**

**The health of workers can be protected by adopting the following measures:**

- Proper Designing of building, Work area.
- Relaxation facilities to workers with good ventilation & air circulation. This will help in relieving of thermal stress.
- Good Housekeeping practices.
- Well engineered ventilation & exhaust system.
- Enclosure.
- Isolation of specific areas
- Enforcement of usage of Personal Protective Devices.
- Regular Work Environment Monitoring
- Statistical Monitoring
- Working hours
- Rotation of employees in specific areas to avoid continuous exposure

**xv. Post project monitoring plan**

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
<b>1. Water &amp; Waste water quality</b>				
A.	Water quality in the area	Once in a month except for heavy metals which will be monitored on quarterly basis.	Composite sampling (24 hourly)	As per IS: 10500
B.	Effluent at the outlet of the ETP	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules, 1996
C.	Sanitary waste water	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules 1996
<b>2. Air Quality</b>				
A.	Stack Monitoring	Online monitors (WHRB & FBC boiler stacks) Once in a month		PM  PM, SO <sub>2</sub> & NO <sub>x</sub>
B.	Ambient Air quality	Twice a week	24 hours continuously	PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> & NO <sub>x</sub>
C.	Fugitive emissions	Once in a Month	8 hours	PM
<b>3. Meteorological Data</b>				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
<b>4. Noise level monitoring</b>				
	Ambient Noise levels	Twice in a year	Continuous for 24 hours with 1 hour interval	Noise levels

## CHAPTER – 12

# DISCLOSURE OF CONSULTANT ENGAGED



### 12.1 DISCLOSURE OF CONSULTANT ENGAGED [Gen. TOR # 2 (i)]

**PIONEER ENVIRO LABORATORIES & CONSULTANTS PVT. LTD.** is QCI-NABET accredited EIA Consultant, vide certificate No. NABET/ EIA/ 1619/ RA 026 & ISO 9001-2008 certified company. It is one of the leading Environmental Consultancy organizations in South India and Chhattisgarh. Established in 1996 **PIONEER ENVIRO** has an excellent track record of serving several well-established Group companies across the Country.



**PIONEER ENVIRO** is a team of professionals in various disciplines such as Environmental Engineering & Environmental Management. The team is slated to double in next two years. Our goals are to provide all of our clients with quality services at a fair, competitive price. By offering a turnkey service (excepting some specific areas), we can maximize the efficiency of data collection so that our clients pay one time for similar services. The technologies deployed at **PIONEER ENVIRO** are current and leading edge, duly validated.

**PIONEER ENVIRO** has an exceptional team of Environment professionals. **PIONEER ENVIRO** has the expertise to assess the impact of various industrial activities such Coal Washery, Power Plants, Steel Plants, Distilleries, Cement Plants etc., on the environment. These assessments will help the industry to install the best Environmental Management Systems and to maintain the plant in accordance with the norms stipulated for ISO-14001 & ISO-18000. **PIONEER ENVIRO** services range from site assessments, environmental audits, environmental impact statements and risk assessments to waste management.

Following are some of the services which are **PIONEER ENVIRO** core competency:

- ❖ Helping the client to select the suitable site as per the norms of Ministry of Environment and Forest, Govt. of India and State Pollution Control Boards in India.
- ❖ Environmental Impact assessment studies carried out as per the guidelines issued by Ministry of Environment and Forest, Govt. of India and State Pollution Control Boards in India.
- ❖ Environment Audits.
- ❖ Risk Assessment and Disaster Management Studies.

- ❖ Occupational health & industrial hygiene.
- ❖ Solid waste management.
- ❖ Environmental baseline studies covering the fields of ambient Air, Surface water, Ground water, Soil, Noise and Biological Environment (Flora & Fauna).
- ❖ Stack Emission Monitoring, Effluent Analysis, Ground water analysis.
- ❖ Design of Effluent Treatment Plant
- ❖ Design of Sewage Treatment Plant

**Quality Council of India**  
 National Accreditation Board for  
 Education & Training

**CERTIFICATE OF ACCREDITATION**

This is to certify that  
**M/s Pioneer Enviro Laboratories & Consultants Pvt. Ltd., Hyderabad**

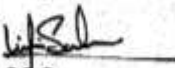
is hereby accorded accreditation under the QCI-NABET Scheme for Accreditation of  
 EIA Consultant Organizations (Version 3)

**Scope of Accreditation:**

Sl.No.	Name of the Sector	Cat.
1	Mining of minerals including opencast only	A
2	River Valley projects	A
3	Thermal power plants	A
4	Coal washeries	A
5	Mineral beneficiation	B
6	Metallurgical industries (ferrous & non-ferrous)	A
7	Cement plants	A
8	Chlor-alkali industry	A
9	Chemical fertilizers	B
10	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A
11	Distilleries	A
12	Sugar Industry	B
13	Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones (SEZs), Biotech Parks, Leather Complexes	A
14	Common Municipal Solid Waste Management Facility (CMSWMF)	B
15	Building and construction projects	B
16	Townships and Area development projects	B

Name of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes published on website dated July 12, 2016.  
 Accreditation to the above is subject to the EIA reports being prepared by the experts (EIA Coordinators and Functional area Expert) mentioned in the above minutes and compliance to the Terms and Conditions of Accreditation.

**Certificate No: NABET/EIA/1619/ RA 026** **Valid Up to: June 22, 2019**  
(Subject to continual compliance to NABET scheme)

  
**C.B.O**  
**NABET**

## *List of Annexures*

<b>Annexure</b>	<b>Documents</b>
Annexure – 1	Executive Summary
Annexure – 2	Earlier Environment Clearance
Annexure – 3	A letter issued by DFO confirming there are no National Parks, Wild life Sanctuaries, eco-sensitive zones, elephant / tiger reserves, migratory routes and Bird Sanctuaries within 10 Km radius.
Annexure – 4	Complete AAQ One season data
Annexure – 5	Socio-economic details
Annexure – 6	Expression of Interest for Utilization of Ash
Annexure – 7	Corporate Environment Policy
Annexure – 8	MoU for Imported Coal
Annexure – 9	CGWB Approval
Annexure – 10	Public Hearing proceeding

<b>Vikas Metaliks and Energy Limited</b>	<b>ANNEXURE - 1</b>
<b>Executive Summary</b>	

### **i. Project name and location**

**Name of the project** : Vikas Metaliks and Energy Limited  
**Location of the Plant** : Bartori Village, Tilda Tehsil, Raipur District, Chhattisgarh

### **ii. Products and Production capacities**

The proposed Steel Plant envisages manufacturing of the following products

<b>S.No.</b>	<b>Details</b>		<b>Plant Configuration</b>	<b>Production Capacity</b>
1.	DRI Kilns		4 x 100 TPD	1,20,000 TPA
2.	Induction furnace with CCM & LRF		3 x 15 MT/heat	1,35,000 TPA
3.	Rolling Mill		1 x 300 TPD	90,000 TPA
4.	Power Generation	WHRB	4 x 2 MW	8 MW
		FBC Boiler (40 TPH)	---	8 MW

### **iii. Requirement of land, raw material, water, power, fuel**

#### **a). Total land Requirement**

The proposed project will be taken up in an area of 34.26 acres / 13.86 Ha. The Khasra nos. of the project site are 149/5, 6, 8, 9, 10, 15, 16, 20, 21, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 158/1, 158/3, 180, 181/3, 215, 217/3.

#### **b). Raw Material & Fuel requirement for the Proposed Project**

The following will be the raw material requirement for the proposed project:

<b>Raw Material</b>		<b>Quantity</b>	<b>Sources</b>	<b>Mode of Transport</b>
<b>For DRI Kilns (Sponge Iron)</b>				
Iron ore		1,92,000	NMDC, Bailadila/ Bachheli & Open Market	By rail & road (through covered trucks)
Coal	Indian	1,56,000	SECL, Chhattisgarh / MCL Odisha	By rail & road (through covered trucks)
	Imported	1,11,000	Indonesia / South Africa / Australia	Through sea route, rail route & by road
Dolomite		6,600	Local area	By road (through covered trucks)
Limestone		9,000	Local area	By road

Raw Material	Quantity	Sources	Mode of Transport
			(through covered trucks)
<b>For Induction Furnace (MS Billets)</b>			
Sponge Iron	1,20,000	In plant generation	By Road (through covered trucks)
Scrap	35,600	Local area	By road (through covered trucks)
Ferro Alloys	1,350	Local area	By road (through covered trucks)
<b>For Rolling Mill (TMT bars &amp; Structural Steel)</b>			
M.S. Ingots / Steel billets	99,000	In plant generation	through conveyors
Furnace oil	4950	HPCL/IOCL depots	Tankers
Coal	24,000	SECL, C.G. / MCL Odisha	By rail & road (through covered trucks)
Producer gas	8000 Nm <sup>3</sup> /hr	In plant generation	---
<b>For FBC Boiler [Power Generation 8 MW]</b>			
Dolochar	36,000	In plant generation	through covered conveyors
Coal	Indian	50,400	SECL C.G. / MCL Odisha
	Imported	35,840	Indonesia / South Africa / Australia
			By rail & road (through covered trucks)
			Through sea route / rail route / by road

### c). Water Requirement

The water requirement for the proposed project will be 450 KLD. This includes Make-up water for DRI Kiln, Induction Furnace, Rolling Mill, Power Plant. Water required for the proposed project will be sourced from Ground Water. Ground Water drawl permission from CGWA has been obtained NOC no. CGWA/NOC/IND/ORIG/2018/3370. Letter is yet to be issued. Air cooled condensers will be provided to FBC boiler. Hence the net water requirement will be substantially reduced.

The following is the break-up of the water requirement for proposed project.

#### WATER REQUIREMENT

S.No.	Water requirement	Quantity in KLD
1.	DRI kiln	110
2.	Steel melting shop	100
3.	Rolling mill	25
4.	Power Plant (16 MW)	

	Cooling tower makeup	96
	Boiler make up	74
	DM plant Regeneration	30
5.	Domestic	15
	<b>Total</b>	<b>450</b>

#### d). Power Requirement

Power required for the proposed steel plant will be 18.6 MW and it will be sourced from 16 MW Captive power plant and remaining power of 2.6 MW will be sourced from State Grid.

### iii. Process description

#### a) **Sponge Iron (DRI)**

Refractory lined rotary kilns will be used for reduction of iron ore in solid state. A central Burner located at the discharge end will be used for initial heating of the kiln.

Iron ore will be continuously fed into the kiln along with coal which has dual role of fuel as well as reductant. Dolomite will be added to scavenge the sulphur from the coal. A number of air tubes will be provided along the length of the kiln. The desired temperature profile will be maintained by controlling the volume of the combustion air through these tubes. The Carbon monoxide generated due to the combustion of coal, reduces the iron ore and converts it into sponge iron. The rotary kiln is primarily divided into two zones viz. the pre heating zone and the reduction zone. The preheating zone extends over 30 to 50 % of the length of the kiln and in this the moisture in the charge will be driven off and the volatile matter in the coal will be burnt with the combustion air supplied through the air tubes. Heat from the combustion raises the temperature of the lining and the bed surface. As the kiln rotates, the lining transfers the heat to the charge. Charge material, pre-heated to about 1000<sup>0</sup>C enters the reduction zone. Temperature of the order of 1050<sup>0</sup>C will be maintained in the reduction zone, which is the appropriate temperature for solid state reduction of iron oxide to metallic iron.

This hot material will be transferred to Heat exchanger. In Heat exchanger the material will be cooled to 160<sup>0</sup>C. The cooler discharge material consists of sponge iron lumps, sponge iron fines and char. Magnetic and non-magnetic material will be separated through

magnetic separators and stored in separate bins. The hot flue gases will be taken to a Waste Heat Recovery Boilers and after heat recovery they will be treated in high efficiency ESP and discharged into the atmosphere through stack whose height will be in accordance with CPCB norms.

**b) Steel Melting Shop**

In Steel Melting Shop (SMS), Sponge Iron will be melted along with melting scrap and fluxes to make pure liquid steel and then to mould it in required size billets. The SMS will consist of Induction furnace, Ladles, Cranes & Continuous Casting Machine (CCM). There will be 3 nos. of Induction Furnaces in the SMS plant, each of 15T capacity. MS Ingots/ MS Billets will be produced in Continuous Casting Machine.

**c) Rolling Mill**

In the proposed project, there will 1 X 300 TPD reheating furnaces is proposed for the heating of billets. Furnace will be heated with Producer Gas / Furnace oil. A bar and round mill will be installed in the plant to produce 300 TPD of TMT bars/ Structural steel.

**d) Power generation through WHRB Boiler**

The hot flue gases from DRI kilns will pass through waste heat recovery Boilers to recover the heat and to generate 1 x 8 MW electricity. The gases after heat recovery will pass through ESPs and then discharged through chimneys into the atmosphere for effective dispersion of emissions into the atmosphere.

**e) Power generation through FBC Boiler**

Coal (Imported / Indian) and dolochar will be used in FBC Boilers to generate 8 MW electricity. The flue-gases will be treated in high efficiency ESP and then discharged through stack into the atmosphere.

**Emissions from proposed project**

S.No.	Stack attached to	PM (g/s)	SO <sub>2</sub> (g/s)	NOx (g/s)
1.	DRI kiln with WHRB (2 x 100 TPD)	0.9 (per flue)	30 (per flue)	1.8 (per flue)
2.	DRI kiln with WHRB (2 x 100 TPD)	0.9 (per flue)	30 (per flue)	1.8 (per flue)
3.	Induction Furnace (3 x 15 T)	0.5 (per stack)	---	1.0 (per stack)
4.	Rolling Mill (1 x 300 TPD)	0.4	15.3	0.8
5.	AFBC Boiler * (40 TPH Boiler)	0.5	1.8	1.8

**Effluent generation**

There will be no effluent generation in the DRI plant, Induction Furnace & Rolling mill as closed circuit cooling system will be adopted. Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench. The following will be the total wastewater & it's break-up.

**WASTEWATER BREAKUP**

S.No.	Source	Generation (KLD)
1.	Power Plant	
	a) Cooling Tower blowdown	24
	b) Boilers blowdown	22
	c) D.M. plant regeneration water	30
2.	Sanitary Wastewater	12
	<b>Total</b>	<b>88</b>

**Solid & Hazardous waste generation**

S.No	Waste / By product	Quantity (TPA)	Method of disposal
1.	Ash from DRI	21,600	Will be used in own brick manufacturing unit and remaining quantity will be given to other brick manufacturers.
2.	DoloChar	36,000	Will be utilized in FBC boiler as fuel
3.	Wet scrapper sludge	54,540	Will be given to other brick manufacturers.
4.	Kiln Accretion Slag	12,720	Will be used in road construction

5.	Slag from SMS	13,500	Slag will be crushed and after recovery of iron, it will be used for road construction.
6.	Mill Scale from Rolling Mill	4,500	Will be reused in SMS
7.	Ash from Power Plant (with Indian coal)	22,680	Will be given to Cement Plants & Brick manufacturers.
8.	Ash from Power Plant (with Imported coal)	5,376	Will be given to Cement Plants & Brick manufacturers.
9.	Ash from Power Plant (with Indian coal + Dolochar)	36,180	Will be given to Cement Plants & Brick manufacturers.
10.	Ash from Power Plant (with Imported coal + Dolochar)	25,056	Will be given to Cement Plants & Brick manufacturers.
11.	Tar (from Producer gas plant)	576	Will be given to Coal tar distillation units
12.	Ash (from Producer gas plant)	3600	Will be given to Cement plant

### Material balance

#### **(A) SPONGE IRON UNIT [4 x 100 TPD DRI Kilns]**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity (TPA)
1.	Iron Ore	1,92,000	Sponge Iron	1,20,000
2.	Coal (Indian)	1,56,000	Dolochar	36,000
3.	Dolomite	6,600	Flue Gases	1,18,740
4.	Limestone	9,000	Ash / Dust from Bag filters	21,600
5.			Wet Scraper sludge	54,540
6.			Accretion slag	12,720
	<b>Total</b>	<b>3,63,600</b>	<b>Total</b>	<b>3,63,600</b>

#### **(B) INDUCTION FURNACE (3 x 15 MT)**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity (TPA)
1.	Sponge Iron	1,20,000	MS Billets / Ingots	1,35,000
2.	MS Scrap	35,600	Slag	13,500
3.	Ferro Alloys	1,350	Flue Gases	8,450
	<b>Total</b>	<b>1,56,950</b>	<b>Total</b>	<b>1,56,950</b>

#### **(C) ROLLING MILL**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity (TPA)
1.	M.S. Ingots / Steel billets	99,000	Rolled Products	90,000

			Mill scales	4,500
			Gases	4,500
	<b>Total</b>	<b>99,000</b>	<b>Total</b>	<b>99,000</b>

**(D) POWER PLANT [8 MW]**

**With 100 % Indian Coal**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity
1.	Coal (Indian)	50,400	Electricity	8 MW
2.			Ash	22,680 TPA
			Gases including dust	27,720 TPA
	<b>Total</b>	<b>50,400</b>	<b>Total</b>	<b>50,400 TPA</b>

**Note: Ash in Indian coal is considered Max. of 45%**

**With 100 % Imported Coal**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity
1.	Coal (Imported)	35,840	Electricity	8 MW
2.			Ash	5,376 TPA
			Gases	30,464 TPA
	<b>Total</b>	<b>35,840</b>	<b>Total</b>	<b>35,840 TPA</b>

**Note: Ash in Imported coal is considered Max. of 15%**

**Indian Coal with combination of Dolochar**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity
1.	Coal (Indian)	32,400	Electricity	8 MW
2.	Dolochar	36,000	Ash	36,180 TPA
			Gases including dust	18,280 TPA
	<b>Total</b>	<b>54,460</b>	<b>Total</b>	<b>54,460 TPA</b>

**Note: Percentage of Ash in Indian coal is considered as 45% & 60 % in Dolochar**

**Imported Coal with combination of Dolochar**

INPUTS			OUTPUTS	
S.No.	Item	Quantity (TPA)	Item	Quantity
3.	Coal (Imported)	23,040	Electricity	8 MW
4.	Dolochar	36,000	Ash	25,056 TPA
			Gases	33,984 TPA
	<b>Total</b>	<b>59,040</b>	<b>Total</b>	<b>59,040 TPA</b>

**Note: Ash in Imported coal is considered as 15% & 60 % in Dolochar**

**v. Measures for mitigating the impact on the environment**

**a. Impact due to Air emission on the Environment & on nearest habitation**

- The flue gases from the DRI kilns will pass through Waste Heat Recovery Boiler and after heat recovery the gases will be treated in High efficiency ESP and then discharged into the atmosphere through **2 no. of combined stacks** each of **71 m** height attached to **each 2 x 100 TPD kilns**, to bring down the particulate emission in the exhaust gases to below **50 mg/Nm<sup>3</sup>**.
- The Fugitive emissions from the Induction furnaces will be sucked through hoods and will pass through a fume extraction system with bag filters and then the treated gases will be discharged into the atmosphere through **3 no. of stacks each of 30 m height** for effective dispersion of emissions from Induction Furnaces. The outlet dust emission in the exhaust gases will be less than **50 mg/Nm<sup>3</sup>**. The dust will be pneumatically carried to covered bins.
- The flue gases will be discharged into the atmosphere through a stack of **47 m** height for effective dispersion of emissions from Induction Furnaces.
- The Exhaust emissions from FBC Boiler will pass through a high efficiency ESP to bring down the particulate matter to less than **30 mg/Nm<sup>3</sup>** and will be let out into the atmosphere through a stack of **62 m** height for effective dispersion of emissions into the atmosphere.
- Energy meters will be provided to all air pollution control systems to ensure effective operation of the control systems.
- Fugitive emissions will be monitored as per CPCB norms.
- All air emission control systems will be taken-up for maintenance as per prescribed schedule and compliance with norms will always be ensured.
- Stack monitoring and Ambient air quality checks at regular interval by SPCB will also help in cross checking the performance of Pollution control systems installed in the plant.

**Hence there will not be any adverse impact on Near by village due to the proposed project.**

**b. Wastewater Treatment / disposal proposed**

There will be no effluent generation in the DRI plant, Induction Furnace & Rolling mill as closed-circuit cooling system will be adopted. Effluent from power plant will be treated and after ensuring compliance with SPCB norms, it will be utilized for dust suppression, ash conditioning and for greenbelt development. Sanitary waste water will be treated in septic tank followed by sub-surface dispersion trench.

**vi. Capital cost of the project, estimated time of completion**

The total capital investment of the proposed project is Rs. 125 Crores. The proposed project will be implemented in 24 months from the date of issue of Environmental Clearance.

**vii. Site Selection / Environment Setting within 10 Km. radius.**

S.No.	Salient Features / Environmental features	Distance w.r.t. site / Remarks
1.	Type of Land	Uncultivated land
2.	National Park/ Wild life sanctuary / Biosphere reserve / Tiger Reserve / Elephant Corridor / migratory routes for Birds	Nil
3.	Historical places / Places of Tourist importance / Archeological sites	Nil
4.	Critically polluted area as per MoEF&CC Office Memorandum dated 13 <sup>th</sup> January 2010	Nil
5.	Defence Installations	Nil
6.	Nearest village	Bartori – 0.4 Km.
7.	No. of Villages in the Study Area	50
8.	Nearest Hospital	Tilda – 5.4 Kms. (NNW)
9.	Nearest School	Tilda – 5.4 Kms. (NNW)
10.	Forests	Bilari RF (9.8 Kms.) No forest land is involved in the proposed project site.
11.	Water body	Jamuniya nala – 1.5 Kms. Mahanadi Bhatapara Branch Canal – 0.6 Kms. No River / Stream passes through the proposed project site.
12.	Nearest Highway	Nil
13.	Nearest Railway Station	Baikunth R S – 2.9 Kms

### viii. Baseline environmental data

#### Ambient air quality

Ambient air quality was monitored for PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>x</sub> & CO at 8 stations including project site during March 2017 to May 2017. The following are the concentrations of various parameters at the monitoring stations:

Parameter		Concentration
PM <sub>2.5</sub>	:	16.4 to 33.4 µg/m <sup>3</sup>
PM <sub>10</sub> *	:	28.9 to 58.5 µg/m <sup>3</sup>
SO <sub>2</sub>	:	7.2 to 14.5 µg/m <sup>3</sup>
NO <sub>x</sub>	:	7.0 to 18.9 µg/m <sup>3</sup>
CO	:	354 to 758 µg/m <sup>3</sup>

\* PAH in PM<sub>10</sub> were analyzed and their concentrations at all monitoring Stations are Below Detectable Level.

#### Water Quality

##### Surface Water Quality

There are no major rivers flowing within 10 Km. radius of the study area. Jamuniya nala is flowing at a distance of 1.5 Kms. However, there is no water available during the study period. Hence a sample from Kirna Tank (3.2 Kms.) & from Batapara Mahanadi Canal (0.7 Kms.) have been collected and analyzed for various parameters. The analysis of samples shows that all the parameters are in accordance with BIS-2296 specifications.

##### Ground Water Quality

8 No. of ground water samples from open wells / bore wells were collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

#### Noise Levels

Noise levels were measured at 8 locations during day time & Night time. The noise levels at the monitoring stations are ranging from 39.25 dBA to 59.10 dBA.

## ix. Identification of hazards

Equipment	Process	Potential Hazard	Provision
<b>DRI PLANT</b>			
Sponge Iron Kiln	Reduction of Iron Ore	Falling of Hot Mass & Dust	<ul style="list-style-type: none"> <li>Ensuring before opening the kiln bottom door, first clean the inner surface of the stack cap, such that the dust particle and hard clinkers which deposited in the cap is fallen into the DSC.</li> <li>Ensure before opening the DSC bottom door to check the DSC bar position and condition and to clean if big block of castables or any hard clinkers which is blocking the dust flow passage to wet scrapper chute.</li> <li>Ensure to clean the dust by opening the man hole provided in the chute and check the spiking rods and the screen. In built safety system is provided in the construction of furnace with suitable refractory walls.</li> <li>Allow the wet scrapper to run to remove the sludge, then open the drain pipe of the wet scrapper, which is located at bottom on either side, pour sufficient water to clean the sludge and the slurry dust to flow through drain pipe.</li> <li>Ensure to stop the wet scrapper and open the top plate to check the alignment, weak and tear of the plates and take necessary precaution against the excessive worn out plate.</li> </ul>
Sponge Iron Kiln	Reduction of Iron Ore	Air emission	<ul style="list-style-type: none"> <li>Adequately designed ESP and other Air Pollution control systems will be provided with internal lock to the kiln feeding system in order to prevent by passing of emissions through safety cap and also during non operation of ESP or any other pollution control devices.</li> </ul>
<b>POWER PLANT</b>			
Turbine	Convert pressure in the flue gas into Mechanical Energy	Mechanical & Fire Hazards Noise	<ul style="list-style-type: none"> <li>Layout of Equipment / Machinery will be in accordance to factory and electrical inspectorate.</li> <li>Acoustic enclosure to Turbine</li> </ul>
Generator	Convert	Mechanical & Fire	<ul style="list-style-type: none"> <li>Layout of Equipment / Machinery will be in</li> </ul>

Executive Summary

Equipment	Process	Potential Hazard	Provision
	Mechanical energy into electrical energy	Hazards a) Lube Oil System b) Cable galleries c) Short circuits	accordance to factory and electrical inspectorate.
		Noise	<ul style="list-style-type: none"> <li>Acoustic enclosure</li> <li>Isolated panel rooms</li> <li>Special foundation with vibration absorbers</li> </ul>
Power Transformers	50,000 KVA capacity	Fire and explosion	Automatic fire fighting system will be provided. Isolated with fencing and restricted entry.
Switch Yard	transformer	Fire	All electrical fittings and cables are provided as per the specified standards.
Switch Yard control room		Fire in cable galleries and switch	
Coal storage shed	Storage of coal for 10 days requirement.	Fire and spontaneous combustion	Coal storage yard will be continuously sprinkled with water with garden type sprinklers.
Coal handling bunkers	----	Fire and dust explosions	Continuous water sprinkling
Compressor House	Plant operation	Governor failure due to the failure of pins and springs leading to opening of safety valves	The design precautions of safety will be followed in manufacture and erection of compressors.
Coal storage yard	Coal dust is combustible	Explosion Hazard	<ul style="list-style-type: none"> <li>Coal storage shall be minimised</li> <li>Coal piles shall not be located above heat sources such as steam lines.</li> <li>motors.</li> <li>All mechanical &amp; electrical equipment inside the coal storage area shall be approved for use in hazardous locations and provided with spark proof</li> </ul>
STG, draft fans, soot blowing from boiler, ventilation pipes	Noise generated due to operation of STG, working of fans, ventilation system,	Noise hazard	<ul style="list-style-type: none"> <li>Acoustic enclosures will be provided to STG.</li> <li>Enclose fans, insulating ventilation pipes</li> <li>use of dampeners.</li> </ul>
Failure of APCS	Dust / Smoke	Air emission	<ul style="list-style-type: none"> <li>Interlocking system will be provided and whenever APCS is not working, then raw material feed will be stopped. Consequently</li> </ul>

Equipment	Process	Potential Hazard	Provision
			<p>there will be no production in the unit till APCS is rectified.</p> <ul style="list-style-type: none"> <li>• The unit cannot be stopped immediately and it will take some time to stop. During this period release of particulate matter will take place, hence mobile dust suppression system will be provided to suppress the particulate matter immediately to mitigate the impact of PM on surroundings.</li> <li>• Depending upon the wind direction at the time of emergency, Mobile dust suppression equipments will be provided to suppress the dust within the plant and also outside the plant to reduce the impact on habitation, water body, crops etc.</li> <li>• Immediately upon failure of any APCS, emergency siren will be blown to inform the employees and nearby villagers about the emergency.</li> <li>• Dust masks will be provided to the employees and near by villagers. Immediately upon hearing siren, every employee and villager must wear the dust mask.</li> <li>• Mock drills will be conducted in the nearby villages for the emergency preparedness.</li> </ul>

#### x. Impact of the project on air, water, land, flora-fauna and nearby population

Zero effluent discharge will be adopted. All the required air pollution control systems will be provided to comply with CPCB / SPCB norms. All solid wastes will be disposed / utilized as per CPCB / SPCB norms. 11.3 Acres of greenbelt will be developed as per guidelines. Hence there will not be any adverse impact on land environment due to the proposed project.

#### xi. Emergency preparedness plan

As part of Emergency preparedness plan the following shall be taken care

- Communication systems (including Public Address System)
- Emergency Siren
- Transport for evacuation of plant personnel

**Executive Summary**

- Proving proper Assembly area
- First Aid facility including ambulance at site
- Fire Fighting and rescue arrangements
- Security arrangements
- Breathing air sets and facilities for bottling of breathing air.
- Laboratory facilities
- Fire Alarm System –Heat & Smoke Detectors
- Fire Pump House

## xii. Issues raised during public hearing (if applicable) and response given

The followings compliances given by the Project proponent on the Issues raised by the people during Public hearing :-

Sr. No.	Issues raised		Project Proponent Reply
i.	Agreement for employment	=	Agreed, priority will be given to local people as per their qualification and capabilities.
ii.	Minimum wages	=	Project Proponent has assured that rate of wages will be as per Government norms.
iii.	Pollution control measures	=	The Project Proponent informed that it is proposed to install all the necessary Air Pollution Control devices as Electrostatic Precipitators in Sponge Iron Kilns, Bag Filter in Induction furnace and Electrostatic Precipitator in FBC based Power Plant. Water will be sprinkled for control of dust emanation. Closed cooling circuit will be implemented in Sponge Iron kilns, Induction furnaces and Rolling Mill, hence there will not be any effluent generation. However effluent from power plant will be treated in neutralization cum settling tanks and treated effluent will be reuse for horticulture purpose, dust suppression and ash conditioning within proposed
			premises only and no effluent will be letout the premises and ZERO discharge condition will be implemented. <i>Contd. ...</i>
iv.	Crop damage	=	Regarding this, the Project Proponent informed that it is proposed to install Electrostatic Precipitators Sponge Iron Kilns, Bag Filter in Induction furnace and Electrostatic Precipitator in FBC based power Plant. Water will be sprinkled for control of dust emanation. Hence after implementation of these measures there will not be any possibility of crop damage.
v.	Health and education	=	Education and health facilities to villagers will be provided under CSR.
vi.	15 feet wide road will be provided to villagers for their movements.	=	Agreed, Project proponent has informed that Company will provide 15 feet wide road closed to Rly. Lines for local villagers.

### xiii. ESC activities with proposed expenditure

Vikas Metaliks & Energy Limited will be actively contribute to improve the Socio-economic conditions of the area by providing assistance for local persons preferable from the nearby villages. The continuing commitment by business to behave ethically and contribute to economic development while improve the quality of life of workforce and their families as well as that of the local community and society at large.

#### Details of expenditure for ESC activities

Total cost of the proposed project	:	Rs. 125 Crores
Expenditure earmarked towards ESC condition)	:	2.5 % of project cost (as per TOR
	:	Rs. 3.2 Crores

### xiv. Occupational Health Measures

The health of workers can be protected by adopting the following measures:

- Proper Designing of building, Work area.
- Relaxation facilities to workers with good ventilation & air circulation. This will help in relieving of thermal stress.
- Good Housekeeping practices.
- Well engineered ventilation & exhaust system.
- Enclosure.
- Isolation of specific areas
- Enforcement of usage of Personal Protective Devices.
- Regular Work Environment Monitoring
- Statistical Monitoring
- Working hours
- Rotation of employees in specific areas to avoid continuous exposure

**xv. Post project monitoring plan**

S.No.	Particulars	Frequency of Monitoring	Duration of sampling	Parameters required to be monitored
<b>1. Water &amp; Waste water quality</b>				
A.	Water quality in the area	Once in a month except for heavy metals which will be monitored on quarterly basis.	Composite sampling (24 hourly)	As per IS: 10500
B.	Effluent at the outlet of the ETP	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules, 1996
C.	Sanitary waste water	Twice in a month	Grab sampling (24 hourly)	As per EPA Rules 1996
<b>2. Air Quality</b>				
A.	Stack Monitoring	Online monitors (WHRB & FBC boiler stacks) Once in a month		PM  PM, SO <sub>2</sub> & NO <sub>x</sub>
B.	Ambient Air quality	Twice a week	24 hours continuously	PM <sub>2.5</sub> , PM <sub>10</sub> , SO <sub>2</sub> & NO <sub>x</sub>
C.	Fugitive emissions	Once in a Month	8 hours	PM
<b>3. Meteorological Data</b>				
	Meteorological data to be monitored at the plant.	Daily	Continuous monitoring	Temperature, Relative Humidity, rainfall, wind direction & wind speed.
<b>4. Noise level monitoring</b>				
	Ambient Noise levels	Twice in a year	Continuous for 24 hours with 1 hour interval	Noise levels

F. No. J-11011/80/2008- IA II (I)  
 Government of India  
 Ministry of Environment and Forests  
 (I.A. Division)

Paryavaran Bhawan  
 CGO Complex, Lodhi Road  
 New Delhi - 110 003

E-mail : [pb.rastogi@nic.in](mailto:pb.rastogi@nic.in)  
 Telefax : 011: 2436 7668  
 Dated 9<sup>th</sup> June, 2009

To,  
 The Director  
 M/s Vikas Metaliks & Energy Ltd.  
 F-4, 1<sup>st</sup> Floor, Modern Complex  
 Motibag Chowk, Raipur - 492001  
 Chhattisgarh

E-mail : [vspower@rediffmail.com](mailto:vspower@rediffmail.com) ; Fax No. : 07782 - 247344 ;

**Subject :** Mini Integrated Steel Plant at Village Batori, Tehsil Tilada, District Raipur, Chhattisgarh by M/s Vikas Metaliks & Energy Ltd. - Environment clearance reg.  
**Ref. :** Your letter dated 18<sup>th</sup> March, 2009.

Sir,

This has reference to your letter 18<sup>th</sup> March, 2008 alongwith Form I, Pre-feasibility Report, EIA/EMP and related project documents and subsequent clarifications furnished by you vide your letters dated 4<sup>th</sup> & 7<sup>th</sup> April, 2008 and 22<sup>nd</sup> May, 2009 for environmental clearance on the above mentioned project.

2.0 The Ministry of Environment and Forests has examined the application. It is noted that proposal is for the Mini Integrated Steel Plant at Village Batori, Tehsil Tilada, District Raipur, Chhattisgarh by M/s Vikas Metaliks & Energy Ltd. Proposed unit is outside the banned area viz. Siltara, Borjhara & Urla where coal based sponge iron plants and captive power plants are banned by the Govt. of Chhattisgarh. Total land acquired is 100 acres. No National park/Wild life sanctuary/Reserve forest is located within 10 Km radius of the project. Total cost of the project is Rs. 350.00 Crores. Following will be the configuration of the proposed plant :

S.N.	Details	Plant Configuration	Production Capacity
1	Pelletizing Plant	1x2000 TPD	6,00,000 TPA
2	Pig iron through Micro Blast Furnace	1x250 m <sup>3</sup>	1,65,000 TPA
3	Sponge Iron Unit	2x175 TPD	1,05,000 TPA
		1x500 TPD	1,50,000 TPA
4	Induction Furnace	4x15MT/Heat	1,80,000 TPA
5	Rolling Mill	1x300 TPD	90,000 TPA
6	Ferro-Alloys Unit	1x9 MVA	15,000 TPA
7	Power Plant (WHRB Based)	1x12 MW	12 MW
		2x3.0 MW	6 MW
9	Power Plant (FBC Based)	1x15 MW	15 MW

3.0 Iron ore, coal and dolomite will be used to manufacture sponge iron using DRI process. Sponge iron will be melted in induction furnace alongwith the scrap to produce M.S. billets/ingots. The billets/ingots will be fed to rolling mill to produce rolled products.

4.0 Electrostatic precipitator (ESP), bag house, bag filters, multi-cyclones, dust catcher, ventury scrubber shall be provided to control gaseous emissions within  $100 \text{ mg/Nm}^3$ . Pulse jet type bag filters, dust suppression system, dust extraction system, fume extraction system etc. will be provided to control fugitive emissions. Total ground water requirement from the Tarpragi annicut will be  $3,685 \text{ m}^3/\text{day}$ . No ground water will be used. Closed circuit cooling system will be used. Treated effluent will be recycled/reused into DRI plant and rolling mill as make up water for cooling and also for ash conditioning, dust suppression and green belt development. 'Zero' discharge will be adopted. The char and dolochar from the sponge iron will be used in AFBC boiler as fuel. Accretion slag and wet scrapper sludge shall be used in road construction. Slag from induction furnace will be utilized for road construction as well as filling low-lying areas within the plant premises, if found non-hazardous. Ash from power plant will be utilized for manufacturing bricks and cement. BF slag will be granulated and provided to cement manufacturers. Mill scales will be reused in manufacturing ingots/billets. Slag from Ferro-Manganese manufacture will be used in Silico-Manganese manufacture. Ferro Silicon slag should be used in cast iron foundries.

5.0 Public hearing/public consultation meeting was held on 29<sup>th</sup> January, 2009.

6.0 The Ministry of Environment and Forests hereby accords environmental clearance to the above project under the provisions of EIA Notification dated 14<sup>th</sup> September, 2006 as amended subsequently subject to strict compliance of the following specific and general conditions:

**A. SPECIFIC CONDITIONS :**

- i) Efforts shall be made to reduce RSPM levels in the ambient air and a time bound action plan shall be submitted. On-line ambient air quality monitoring and continuous stack monitoring facilities for all the stacks and sufficient air pollution control devices shall be provided to keep the emission levels below  $100 \text{ mg/Nm}^3$ . At no time the emission level shall go beyond the prescribed standards. Interlocking facilities shall be provided so that process can be automatically stopped in case emission level exceeds the limit.
- ii) Electrostatic precipitator (ESP) shall be provided to DRI plant, sinter plant, pellet plant, WHRB and ABC boilers to control air emissions within  $100 \text{ mg/Nm}^3$ . Bag house shall be provided to BF-Dry gas cleaning system. Gas cleaning plant having dust catcher followed by ventury scrubber shall be provided to blast furnace (BF) and treated gases shall be discharged into atmosphere through stacks of adequate height. Hot gases from DRI kiln shall be passed through Dust Settling Chamber (DSC) to remove coarse solids and After Burning Chamber (ABC) to burn CO completely and used in waste heat recovery boiler (WHRB). The gas then shall be cleaned in ESP before leaving out into the atmosphere through ID fan and stack. Fume extraction system comprising of suction hood, bag filters shall be provided to ferro alloy plant and steel melting shop (SMS) to control emissions within permissible limit. Flue gases from rolling mill shall be discharged through a stack of adequate height as per CPCB guidelines
- iii) Gaseous emission levels including secondary fugitive emissions from blast furnace and sinter plant shall be controlled within the latest permissible limits issued by the Ministry and regularly monitored. Guidelines / Code of Practice issued by the CPCB shall be followed. The emission standards issued by the Ministry in May, 2008 for the sponge plants shall be followed.

- iv) In plant control measures for checking fugitive emissions from all the vulnerable sources like spillage/raw materials/coal handlings etc. shall be provided. Further, specific measures like provision of dust suppression system consisting of water sprinkling, suction hoods, fans and bag filters etc. shall be installed at material transfer points, blast furnace stock house and other enclosed raw material handling areas, unloading areas etc. Centralized de-dusting system i.e. collection of fugitive emissions through suction hood and subsequent treatment through bag filter or any other device and finally emitted through a stack of appropriately designed height conforming to the standards for induction furnaces. Fume extraction system with bag filters shall be provided to ferro alloy plant. Dust extraction system comprising of pulse jet type bag filter and dust suppression system shall be provided to control secondary fugitive emissions from coal & iron screen house, crusher house, product discharge, junction house and SMS bins and. Fugitive emissions shall be regularly monitored and records maintained.
- v) Data on ambient air quality, stack emissions and fugitive emissions shall be regularly submitted on-line to the Ministry's Regional Office at Bhopal, Chhattisgarh Environment Conservation Board (CECB) and Central Pollution Control Board (CPCB) as well as hard copy once in six months. Data on SPM, SO<sub>2</sub> and NO<sub>x</sub> shall also be displayed outside the premises at the appropriate place for the general public.
- vi) Vehicular pollution due to transportation of raw material and finished product shall be controlled. Proper arrangements shall also be made to control dust emissions during loading and unloading of the raw material and finished product. Efforts shall also be made to reduce impact of the transport of the raw materials and end products on the surrounding environment including agricultural land. All the raw materials including fly ash shall be transported in the closed containers only and shall not be overloaded. Water spraying shall be done to prevent dust emissions from vehicular movement. Vehicular emissions shall be regularly monitored and records kept.
- vii) Total water requirement from Tarpragi annicut shall not exceed 3,685 m<sup>3</sup>/day m<sup>3</sup>/day. No ground water shall be used as proposed. Closed circuit cooling system shall be provided to recycle/reuse wastewater. Acidic and alkaline effluent from DM water plant shall be neutralized in neutralization pit and mixed in Central Effluent Monitoring Tank alongwith cooling tower blow down. All the wastewater from process and domestic sources shall be treated and recycled / reused in the DRI plant and rolling mill as make up water for cooling and also for ash conditioning, dust suppression and green belt development. Sanitary wastewater shall be treated in septic tank followed by soak pit. No wastewater shall be discharged outside the premises and 'Zero' effluent discharge shall be ensured.
- viii) Prior permission for the drawl of 3,685 m<sup>3</sup>/day water from Tarpragi annicut from the concerned department shall be obtained.
- ix) The water consumption shall not exceed 16 m<sup>3</sup>/Ton of Steel as per prescribed standard.
- x) Ground water monitoring around the solid waste disposal site / secured landfill (SLF) shall be carried out regularly and report submitted to the Ministry's Regional Office at Bhopal, CPCB and CECB.
- xi) DRI Fines, Coke breeze, Sinter dust, GCP dust, SMS dust, Scale, Iron ore fines shall be used in Sinter Plant. Char, coal washery rejects and middling shall be used in

AFBC based power plant. Granulated slag shall be sold to cement plant. All the other solid wastes including broken refractory mass shall be properly disposed off in environment-friendly manner. Waste oil shall be provided to authorized recyclers/reprocessors.

- xii) All the char and dolochar from the sponge iron shall be utilized in AFBC boiler of power plant and no char shall be disposed off anywhere else. AFBC Plant shall be installed before installation of sponge iron plant so that utilization of char in the AFBC boiler is ensured. Accretion slag and wet scrapper sludge shall be used in road construction. Mill scales shall be reused in manufacturing ingots/billets. All the blast furnace (BF) slag shall be granulated and provided to cement manufacturers for further utilization. SMS slag shall be properly utilized. No solid waste shall be disposed off outside the premises.
- xiii) All the slag from induction furnace shall be used for road making and filling low-lying areas within the plant premises only after passing through Toxic Chemical Leachability Potential (TCLP) test. Otherwise, Ferro chrome shall be recovered from the slag and output waste shall be disposed in secured landfill as per CPCB guidelines.
- xiv) Slag from Ferro-Manganese manufacturing shall be used in the manufacture of Silico-Manganese. Ferro-Silicon slag shall be provided for use in cast iron foundries. Silico-Manganese slag shall be used for road construction or slag cement manufacturing. No solid waste shall be disposed off outside the premises.
- xv) A time bound action plan shall be submitted to reduce solid waste, its proper utilization and disposal.
- xvi) Proper handling, storage, utilization and disposal of all the solid waste shall be ensured and regular report regarding toxic metal content in the waste material and its composition, and use of solid/hazardous waste shall be submitted to the Ministry's Regional Office at Bhopal, CECB and CPCB.
- xvii) Proper utilization of fly ash shall be ensured as per Fly Ash Notification, 1999 and subsequent amendment in 2003. All the fly ash shall be provided to cement and brick manufacturers for further utilization and 'Memorandum of Understanding' shall be submitted to the Ministry's Regional Office at Bhopal within 3 months of issue of this environment clearance.
- xviii) As proposed, green belt shall be developed in 35 acres (35 %) out of total 100 acres within and around the plant premises to mitigate the effects of air emissions as per the CPCB guidelines in consultation with DFO.
- xix) All the recommendations made in the Charter on Corporate Responsibility for Environment Protection (CREP) for the Steel Sector shall be implemented.
- xx) All the commitments made to the public during the Public Hearing / Public Consultation meeting shall be satisfactorily implemented.
- xxi) The company shall provide housing for construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

**B. GENERAL CONDITIONS:**

- i. The project authorities must strictly adhere to the stipulations made by the Chhattisgarh Environment Conservation Board (CECB) and the State Government.
- ii. No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment and Forests.
- iii. The gaseous emissions from various process units shall conform to the load/mass based standards notified by this Ministry on 19<sup>th</sup> May, 1993 and standards prescribed from time to time. The State Board may specify more stringent standards for the relevant parameters keeping in view the nature of the industry and its size and location.
- iv. At least four ambient air quality monitoring stations shall be established in the downward direction as well as where maximum ground level concentration of SPM, SO<sub>2</sub> and NO<sub>x</sub> are anticipated in consultation with the CECB. Data on ambient air quality and stack emission shall be regularly submitted to this Ministry including its Regional Office at Bhopal and the CECB/CPCB once in six months.
- v. Industrial wastewater shall be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19<sup>th</sup> May, 1993 and 31<sup>st</sup> December, 1993 or as amended from time to time. The treated wastewater shall be utilized for plantation purpose.
- vi. The overall noise levels in and around the plant area shall be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (daytime) and 70 dBA (nighttime).
- vii. Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.
- viii. The company shall develop surface water harvesting structures to harvest the rain water for utilization in the lean season besides recharging the ground water table.
- ix. The project proponent shall also comply with all the environmental protection measures and safeguards recommended in the EIA / EMP report. Further, the company must undertake socio-economic development activities in the surrounding villages like community development programmes, educational programmes, drinking water supply and health care etc.
- x. As proposed, Rs. 30.00 Lakhs shall be earmarked towards capital cost and recurring cost/annum for environment pollution control measures to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government. An implementation schedule for implementing all the conditions stipulated herein shall be submitted to the Regional Office of the Ministry at Bhopal. The funds so provided shall not be diverted for any other purpose.

- xi. The Regional Office of this Ministry at Bhopal/CPCB/CECB will monitor the stipulated conditions. A six monthly compliance report and the monitored data along with statistical interpretation shall be submitted to them regularly.
- xii. The Project Proponent shall inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the CECB and may also be seen at Website of the Ministry of Environment and Forests at <http://envfor.nic.in>. This shall be advertised within seven days from the date of issue of the clearance letter, at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same shall be forwarded to the Regional office.
- xiii. Project authorities shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities and the date of commencing the land development work.

7.0 The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

8.0 The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.


9.0 Any appeal against this environmental clearance shall lie with the National Environment Appellate Authority, if preferred within a period of 30 days as prescribed under Section 11 of the National Environment Appellate Act, 1997.

10.0 The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous Wastes (Management and Handling) Rules, 2003 and the Public (Insurance) Liability Act, 1991 along with their amendments and rules

  
(Dr. P. B. Rastogi)  
Director

Copy to:

1. The Secretary, Department of Environment, Govt. of Chhattisgarh, Chhattisgarh.
2. The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-110032.
3. The Chairman, Chhattisgarh Environment Conservation Board, Nanak Niwas, Civil Lines, Raipur, Chhattisgarh.
- ✓ 4. The Chief Conservator of Forests (Eastern), Regional Office (Western Zone), E-3/240, Arera Colony, Bhopal - 462 016, M.P.
5. Adviser (IA-II), Ministry of Environment and Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
6. Monitoring Cell, Ministry of Environment & Forests, Paryavaran Bhavan, CGO Complex, New Delhi.
7. Guard file.
8. Record file.

  
(Dr. P. B. Rastogi)  
Director

## कार्यालय वनमण्डलाधिकारी रायपुर वनमण्डल, रायपुर (छत्तीसगढ़)

☎ : (0771) 2427640, Fax :- 2427640 - E-mail- dfo\_raipur @rediffmail.com

क्रमांक / व.त.अ. / रा / ... 2081  
प्रति,

रायपुर दिनांक 22/05/2017

विकास मेटालिक्स एण्ड एनर्जी लि.  
एफ-4, प्रथम तल, मॉडर्न कॉम्पलेक्स  
गोतीबाग चौक, रायपुर

विषय :- निजी भूमि में मिनी स्टील संयंत्र स्थापना हेतु अनापत्ति प्रमाण-पत्र।

— 00 —

विषयांकित के संबंध में लेख है कि आपके द्वारा ग्राम बरतोरी, तहसील-तिल्दा, जिला रायपुर के प.ह.नं. 13 के विभिन्न खसरो के कुल रकबा 34.36 एकड़ भूमि पर संयंत्र स्थापित किये जाने हेतु अनापत्ति प्रमाण पत्र प्रदाय करने के संबंध में लेख गया था। आवेदित स्थल का निरीक्षण किया गया है। निरीक्षण प्रतिवेदन अनुसार आवेदित भूमि आरक्षित वन, संरक्षित वन अथवा ऑरेंज एरिया की श्रेणी में नहीं आता, तथा उक्त भूमि में कोई वृक्षारोपण नहीं है। आवेदित भूमि वन सीमा से अनुमानित 20 कि.मी. की दूरी पर स्थित है। उक्त भूमि पूर्णतः निजी भूमि है। अतः उक्त भूमि पर संयंत्र स्थापित किये जाने पर विभाग को कोई आपत्ति नहीं होगी।



वनमण्डलाधिकारी  
रायपुर वनमण्डल, रायपुर  
22/5

**One Season Data (1<sup>st</sup> March 2017 to 31<sup>st</sup> May 2017)**

(Units :  $\mu\text{g}/\text{m}^3$ )

<b>Monitoring Station: 1) Plant site</b>					
DATE	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
03-03-2017	22.3	40.2	8.4	7.9	392
04-03-2017	23.3	36.7	7.4	7.4	390
10-03-2017	21.5	36.6	7.7	7.8	414
11-03-2017	21.6	37.9	8.6	8.2	384
17-03-2017	23	34.2	8.8	7.7	382
18-03-2017	23.4	38.6	7.5	7.9	417
24-03-2017	21.8	34.3	8.7	7.8	373
25-03-2017	21.2	35.6	8	7.5	380
07-04-2017	21.3	36.2	8.8	8.4	380
08-04-2017	24.3	40.5	8.6	8.1	419
14-04-2017	24	37.9	8	7.2	408
15-04-2017	22.4	35.1	8.4	7	382
21-04-2017	23.2	39.6	8.7	7.5	396
22-04-2017	21.8	39.8	7.2	7.3	414
28-04-2017	24.3	37.7	8.6	7.6	425
29-04-2017	22.3	40.4	8	8.5	403
05-05-2017	21.1	34.3	7.2	7.5	375
06-05-2017	23.3	38.2	7.2	8.4	420
12-05-2017	20.4	39.7	8.1	8.1	365
13-05-2017	20.9	38	7.8	7.5	371
19-05-2017	20.8	37.9	8.8	7.9	414
20-05-2017	20.5	36.9	7.9	8.4	413
26-05-2017	22.2	39.1	7.3	7.6	385
27-05-2017	20.9	39.3	7.8	7.7	416
<b>Max</b>	<b>24.3</b>	<b>40.5</b>	<b>8.8</b>	<b>8.5</b>	<b>425</b>
<b>Min</b>	<b>20.4</b>	<b>34.2</b>	<b>7.2</b>	<b>7</b>	<b>365</b>
<b>98 percentile</b>	<b>24.3</b>	<b>40.4</b>	<b>8.8</b>	<b>8.4</b>	<b>419</b>

(Units :  $\mu\text{g}/\text{m}^3$ )

<b>Monitoring Station: 2) Bartori</b>					
DATE	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
03-03-2017	24.1	39.4	8.3	8.4	397
04-03-2017	23.1	36.7	8.9	8.7	414
10-03-2017	22.5	42.5	8.4	8	435
11-03-2017	21.6	35.8	8.4	9	435
17-03-2017	22.6	36.5	9.1	8.1	450
18-03-2017	24.4	39.7	7.8	8.4	392
24-03-2017	21.6	35.2	8.5	8.4	448
25-03-2017	22.2	41.2	7.7	8.2	405
07-04-2017	25.5	36	8.9	8.4	390
08-04-2017	22.6	40.6	7.6	8.3	410
14-04-2017	24	41.3	7.6	9	430
15-04-2017	21.3	39.3	7.7	8.6	392
21-04-2017	21.2	35.1	9	8	414
22-04-2017	25	36.6	9.2	8.5	405
28-04-2017	25.2	41.9	7.7	8	430
29-04-2017	24.4	39.2	8.8	8.3	418
05-05-2017	22.7	35.1	8.7	8.1	390
06-05-2017	23.7	42.7	8.7	8.9	398
12-05-2017	24	42.5	9	8.1	412
13-05-2017	25.3	36.6	8.1	8.2	408
19-05-2017	21.6	37.1	8.2	9	406
20-05-2017	25.6	36.5	7.9	8.6	390
26-05-2017	23.8	41.1	8.9	8.9	397
27-05-2017	24.6	36.4	9	8.8	408
<b>Max</b>	<b>25.6</b>	<b>42.7</b>	<b>9.2</b>	<b>9</b>	<b>450</b>
<b>Min</b>	<b>21.2</b>	<b>35.1</b>	<b>7.6</b>	<b>8</b>	<b>390</b>
<b>98 percentile</b>	<b>25.2</b>	<b>42.5</b>	<b>9.1</b>	<b>9</b>	<b>448</b>

**One Season Data (1<sup>st</sup> March 2017 to 31<sup>st</sup> May 2017)**

(Units :  $\mu\text{g}/\text{m}^3$ )

<b>Monitoring Station: 3) Near Century Cement Plant</b>					
DATE	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
03-03-2017	28.5	50.1	9	8.5	464
04-03-2017	30.1	46.3	9.1	9.7	440
10-03-2017	26	42.9	9.5	9.3	464
11-03-2017	27	48.2	9.1	8.3	480
17-03-2017	25.8	42.6	8.3	9.1	452
18-03-2017	28.6	43.3	8	8.3	457
24-03-2017	28.6	47.7	8.7	8.4	480
25-03-2017	26.1	45.1	9.2	8.3	452
07-04-2017	29.4	47.8	9.2	8.2	474
08-04-2017	29.1	42.4	9.4	9.2	477
14-04-2017	25.5	43.3	8.4	8.2	457
15-04-2017	26.5	47.5	7.9	8.3	461
21-04-2017	29.4	46.2	8.5	8.9	460
22-04-2017	30.7	49.6	8.1	9.3	479
28-04-2017	27	51.2	8.5	9.4	474
29-04-2017	25.8	48.3	7.8	9.8	465
05-05-2017	28.4	44.8	9.1	9.6	469
06-05-2017	29.5	46.4	9.2	9.4	448
12-05-2017	29.7	45.3	8.5	9.2	466
13-05-2017	25.6	49.5	8.6	8.8	473
19-05-2017	29.4	50.9	8.8	9.4	471
20-05-2017	27.3	46	8.1	9.7	455
26-05-2017	30.7	43.4	9	9.2	468
27-05-2017	26.8	50.5	8.4	8.6	468
<b>Max</b>	<b>30.7</b>	<b>51.2</b>	<b>9.5</b>	<b>9.8</b>	<b>480</b>
<b>Min</b>	<b>25.5</b>	<b>42.4</b>	<b>7.8</b>	<b>8.2</b>	<b>440</b>
<b>98 percentile</b>	<b>30.7</b>	<b>50.9</b>	<b>9.4</b>	<b>9.7</b>	<b>480</b>

(Units :  $\mu\text{g}/\text{m}^3$ )

<b>Monitoring Station: 4) Kundru</b>					
DATE	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
03-03-2017	23.7	37.1	8.5	8.2	410
04-03-2017	21.8	38.9	8.8	8.4	402
10-03-2017	23.2	37	8.7	8.4	440
11-03-2017	22.4	35.3	9.4	8.7	412
17-03-2017	23.9	34.8	8.7	8.8	417
18-03-2017	23.7	41.8	8.7	8.5	435
24-03-2017	22.2	37.1	9.3	8.1	424
25-03-2017	21.3	42.1	9	8.6	414
07-04-2017	21.9	42.3	8.9	8.5	398
08-04-2017	21.6	36.7	8.7	8.7	434
14-04-2017	24.1	36.2	9.1	8.2	427
15-04-2017	23.8	42	8.7	8.4	421
21-04-2017	23.1	36.8	9.1	8.1	409
22-04-2017	22.8	36.2	8.8	8.2	433
28-04-2017	20.7	35.4	9.2	8.1	422
29-04-2017	21.7	38	8.8	8.8	434
05-05-2017	22	40.5	9.1	8	429
06-05-2017	22.1	40.7	9.2	8.1	433
12-05-2017	21.9	40.4	9.2	8	435
13-05-2017	21.6	39.6	8.8	8.1	395
19-05-2017	21.1	36.4	8.7	8.8	431
20-05-2017	21.3	42	9.2	8.7	429
26-05-2017	22.6	35.7	8.8	8.3	412
27-05-2017	23.6	35.9	9.1	8.8	438
<b>Max</b>	<b>24.1</b>	<b>42.3</b>	<b>9.4</b>	<b>8.8</b>	<b>440</b>
<b>Min</b>	<b>20.7</b>	<b>34.8</b>	<b>8.5</b>	<b>8</b>	<b>395</b>
<b>98 percentile</b>	<b>23.8</b>	<b>42.1</b>	<b>9.3</b>	<b>8.8</b>	<b>436</b>

One Season Data (1<sup>st</sup> March 2017 to 31<sup>st</sup> May 2017)

(Units :  $\mu\text{g}/\text{m}^3$ )

Monitoring Station: 5) Khurmuri					
DATE	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
05-03-2017	21.2	38.5	8.5	7	470
06-03-2017	23.5	40.7	8.1	7.7	479
12-03-2017	24.1	35.8	8.6	7.2	446
13-03-2017	20	37.8	7.7	8.5	462
19-03-2017	19.6	40.3	7.9	9.1	450
20-03-2017	22	39.5	8.2	8.8	446
26-03-2017	20.1	37.8	7.9	10	459
27-03-2017	22.7	35.1	8.6	9.9	437
02-04-2017	20.7	39.9	8.2	8.6	473
03-04-2017	22.4	34	7.8	9.4	431
09-04-2017	21	33.6	8.4	9.9	425
10-04-2017	19.9	39.8	7.5	9.4	436
16-04-2017	23.5	33.2	8.1	8.2	431
17-04-2017	23.7	39.4	8.2	9.5	463
23-04-2017	24.5	38.2	7.7	8	441
24-04-2017	19.6	34.1	7.6	9.8	449
07-05-2017	20.5	38.1	8.6	9.3	428
08-05-2017	22.7	36.9	7.6	7.6	433
14-05-2017	23.4	36.8	7.7	7.3	463
15-05-2017	20.5	35	8.1	8.6	480
21-05-2017	21.4	37.4	8.2	9.1	433
22-05-2017	22	34.6	7.6	9.5	445
28-05-2017	20.8	39.9	7.4	9.2	440
29-05-2017	20.6	38	8.2	7.3	452
<b>Max</b>	<b>24.5</b>	<b>40.7</b>	<b>8.6</b>	<b>10</b>	<b>482</b>
<b>Min</b>	<b>19.6</b>	<b>33.2</b>	<b>7.4</b>	<b>7</b>	<b>425</b>
<b>98 percentile</b>	<b>24.1</b>	<b>40.3</b>	<b>8.6</b>	<b>9.9</b>	<b>479</b>

(Units :  $\mu\text{g}/\text{m}^3$ )

Monitoring Station: 6) Nakti khapri					
DATE	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
05-03-2017	31.2	46.8	9.3	11.5	591
06-03-2017	27.6	45.4	8.1	11.6	636
12-03-2017	31.3	49.8	8.2	12.2	624
13-03-2017	29.7	52.3	8.1	11.5	602
19-03-2017	30.2	46.2	9.3	12.2	595
20-03-2017	31	45.8	8.5	12	631
26-03-2017	31.6	50.4	9.2	12	618
27-03-2017	31	53.1	8.3	10.9	635
02-04-2017	28.4	49	8.9	12.2	609
03-04-2017	30.7	51	8.1	11.4	627
09-04-2017	31.8	46.4	9.1	12.2	590
10-04-2017	30.5	52.8	8.3	11.8	609
16-04-2017	31.2	49.7	8.1	11.3	638
17-04-2017	28.4	45.9	9.3	11.4	640
23-04-2017	28.1	52.2	9.3	11.7	602
24-04-2017	28.4	51	8	11.7	598
07-05-2017	31.2	49.4	8.3	11.5	612
08-05-2017	29.9	48.9	9.3	11.3	590
14-05-2017	27.7	51.5	8.4	10.9	616
15-05-2017	29.7	50.8	9.1	11.6	616
21-05-2017	28	50.4	8.6	12.2	592
22-05-2017	30.8	52	9.2	11.8	616
28-05-2017	27.1	52.1	8.1	12.4	594
29-05-2017	27.8	49.9	8.9	12.2	627
<b>Max</b>	<b>31.8</b>	<b>53.1</b>	<b>9.3</b>	<b>12.4</b>	<b>640</b>
<b>Min</b>	<b>27.1</b>	<b>45.4</b>	<b>8</b>	<b>10.9</b>	<b>590</b>
<b>98 percentile</b>	<b>31.6</b>	<b>52.8</b>	<b>9.3</b>	<b>12.2</b>	<b>638</b>

One Season Data (1<sup>st</sup> March 2017 to 31<sup>st</sup> May 2017)

(Units :  $\mu\text{g}/\text{m}^3$ )

Monitoring Station: 7) Konari					
DATE	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
05-03-2017	23.1	33.3	8.2	7.8	383
06-03-2017	22.3	34.1	7.8	7.6	374
12-03-2017	19.3	32.9	7.7	7.6	364
13-03-2017	21.2	37.9	8	7.8	385
19-03-2017	20.9	37.7	8.4	7.4	361
20-03-2017	20.4	37.8	8.3	7.1	369
26-03-2017	23.3	34.3	7.4	7.3	364
27-03-2017	19.8	36.8	7.3	7.3	377
02-04-2017	21.1	36.6	8.2	7.7	375
03-04-2017	19.2	34.7	8.4	7.8	374
09-04-2017	22.9	38.5	7.4	7.3	382
10-04-2017	23.3	37.1	7.5	8	372
16-04-2017	22.7	38.8	7.8	7.6	385
17-04-2017	22.3	37.2	7.5	7.8	355
23-04-2017	22.8	35.6	7.5	7.5	384
24-04-2017	19.2	37.8	7.6	8	368
07-05-2017	20.6	35.5	7.9	7.9	356
08-05-2017	21.9	33.5	8.1	8	371
14-05-2017	21	34.6	8.3	7.9	387
15-05-2017	22	36	8.2	7.7	359
21-05-2017	21.5	38.1	7.8	7.6	354
22-05-2017	20.4	35.6	7.5	7.6	362
28-05-2017	21	32.5	8.4	7.4	378
29-05-2017	22.4	32.7	8.2	7.9	381
<b>Max</b>	<b>23.3</b>	<b>38.8</b>	<b>8.4</b>	<b>8</b>	<b>387</b>
<b>Min</b>	<b>19.2</b>	<b>32.5</b>	<b>7.3</b>	<b>7.1</b>	<b>354</b>
<b>98 percentile</b>	<b>23.3</b>	<b>38.5</b>	<b>8.4</b>	<b>8</b>	<b>385</b>

(Units :  $\mu\text{g}/\text{m}^3$ )

Monitoring Station: 8) Tilda					
DATE	PM <sub>2.5</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO
05-03-2017	31.9	50.8	13.8	17.1	706
06-03-2017	31.1	47.1	13.5	18.2	659
12-03-2017	30.7	53.3	12.9	15.9	695
13-03-2017	32.6	56.1	13.4	15.5	653
19-03-2017	33.4	55.2	13	16.3	628
20-03-2017	30.1	58.5	14	18.6	677
26-03-2017	31.4	57.7	12.9	15.5	738
27-03-2017	28.4	51.4	13.5	18.9	697
02-04-2017	27.2	56	14.5	17.2	732
03-04-2017	28	57.7	13.6	14.6	747
09-04-2017	32.6	54.6	12.2	15.5	673
10-04-2017	33.2	53.9	14.2	18.3	748
16-04-2017	30.8	53.1	13.3	16.1	646
17-04-2017	27.4	56.2	12	17.7	647
23-04-2017	28.8	48.6	13.9	18.4	754
24-04-2017	30.8	56.3	14.3	14.3	728
07-05-2017	28.5	57.9	13.9	17.3	758
08-05-2017	27.9	47.3	11.9	14.6	665
14-05-2017	31.1	48	11.6	16.3	647
15-05-2017	32.3	52.1	12	14.4	710
21-05-2017	30.8	54.7	13.6	17	638
22-05-2017	27.5	50.7	12	16.1	738
28-05-2017	26.8	58.4	14.3	14.3	634
29-05-2017	29	56.9	12.3	14.6	712
<b>Max</b>	<b>33.4</b>	<b>58.5</b>	<b>14.5</b>	<b>18.9</b>	<b>758</b>
<b>Min</b>	<b>26.8</b>	<b>47.1</b>	<b>11.6</b>	<b>14.3</b>	<b>628</b>
<b>98 percentile</b>	<b>33.2</b>	<b>58.4</b>	<b>14.3</b>	<b>18.6</b>	<b>754</b>

**ANNEXURE – 5**

**SOCIO – ECONOMIC DETAILS**

**POPULATION BREAK UP AS PER CENSUS 2011**

S.No.	Village Name	Total No. of House Holds	Total Population	Total males	Total females	Schedule Caste Population	Scheduled caste males	Scheduled caste Females	Schedule Tribe Population	Scheduled Tribe males	Scheduled Tribe Females
1.	Bhatapara	129	712	357	355	0	0	0	58	28	30
2.	Mauhagaon	256	1255	628	627	893	442	451	8	3	5
3.	Malaud	373	1818	917	901	448	215	233	0	0	0
4.	Silyari Kurud	1409	6963	3493	3470	1403	678	725	206	102	104
5.	Mehar Sakha	153	779	402	377	116	61	55	0	0	0
6.	Kuthrel	270	1204	605	599	588	292	296	0	0	0
7.	Bhatgaon	340	1499	754	745	1150	586	564	31	17	14
8.	Biladi	729	3259	1629	1630	790	394	396	386	181	205
9.	Parsada	283	1417	703	714	291	148	143	0	0	0
10.	Jota	230	1078	537	541	381	187	194	0	0	0
11.	Bhursuda	235	1202	584	618	233	106	127	0	0	0
12.	Silpatti	210	1092	572	520	238	124	114	44	29	15
13.	Tandawa	1105	5555	2846	2709	1817	927	890	337	171	166
14.	Hatband	174	769	407	362	197	106	91	0	0	0
15.	Ninwa	387	1935	968	967	295	146	149	53	25	28
16.	Kirna	617	2863	1459	1404	273	138	135	129	67	62
17.	Jalso	200	932	478	454	20	11	9	87	44	43
18.	Kundru	916	4016	2071	1945	411	210	201	205	104	101
19.	Konari	154	772	403	369	8	4	4	0	0	0
20.	Nakti Khapri	152	735	365	370	368	180	188	0	0	0
21.	Khamhariya	264	1252	612	640	80	38	42	287	139	148
22.	Sirwe	232	1172	580	592	153	75	78	277	136	141
23.	Rajiya	199	906	435	471	277	139	138	20	10	10
24.	Bahesar	343	1694	847	847	593	301	292	25	14	11
25.	Bartori	272	1202	606	596	465	227	238	76	41	35
26.	Chhataud	461	2219	1070	1149	231	103	128	40	18	22
27.	Tarasiw	322	1460	726	734	64	33	31	0	0	0
28.	Ghulghul	187	858	448	410	43	22	21	0	0	0
29.	Chhapora	240	1187	589	598	339	181	158	0	0	0

S.No.	Village Name	Total No. of House Holds	Total Population	Total males	Total females	Schedule Caste Population	Scheduled caste males	Scheduled caste Females	Schedule Tribe Population	Scheduled Tribe males	Scheduled Tribe Females
30.	Deori	294	1376	711	665	86	43	43	0	0	0
31.	Khudmudi	200	969	506	463	235	120	115	0	0	0
32.	Kota	347	1732	882	850	655	337	318	0	0	0
33.	Kohka	262	1137	551	586	203	99	104	46	27	19
34.	Khapri Khurd	139	676	333	343	10	6	4	66	34	32
35.	Bhibhauri	290	1446	726	720	72	34	38	69	35	34
36.	Keotara	297	1469	758	711	674	352	322	151	77	74
37.	Gaurkheda	163	853	425	428	77	41	36	24	11	13
38.	Chicholi	236	1103	539	564	472	238	234	11	5	6
39.	Gaitra	199	892	456	436	427	226	201	29	14	15
40.	Raikheda	696	3541	1734	1807	52	25	27	305	139	166
41.	Kodawa	290	1382	697	685	446	223	223	22	12	10
42.	Bartori 2	285	1573	769	804	2	0	2	125	66	59
43.	Sontara	227	1084	543	541	459	240	219	0	0	0
44.	Deogaon	281	1245	613	632	388	201	187	84	34	50
45.	Khauna	786	3745	1894	1851	933	465	468	176	94	82
46.	Mura	531	2359	1188	1171	625	311	314	20	10	10
47.	Dhansuli	254	1241	607	634	310	151	159	13	7	6
48.	Tilda	7458	36682	18444	18238	6149	2986	3163	1341	625	716
49.	Tulsi	916	4292	2196	2096	650	320	330	150	77	73
50.	Sinodha	443	2111	1023	1088	306	164	142	204	88	116

**LITERACY LEVELS OF THE POPULATION UP AS PER CENSUS 2011**

<b>S.No.</b>	<b>Village Name</b>	<b>Total population Literates</b>	<b>Male literates</b>	<b>Female literates</b>	<b>Total population illiterates</b>	<b>Male illiterates</b>	<b>Female illiterates</b>
1.	Bhatapara	477	274	203	235	83	152
2.	Mauhagaon	723	420	303	532	208	324
3.	Malaud	1175	680	495	643	237	406
4.	Silyari Kurud	4427	2479	1948	2536	1014	1522
5.	Mehar Sakha	493	285	208	286	117	169
6.	Kuthrel	751	439	312	453	166	287
7.	Bhatgaon	897	519	378	602	235	367
8.	Biladi	1797	1072	725	1462	557	905
9.	Parsada	889	506	383	528	197	331
10.	Jota	646	373	273	432	164	268
11.	Bhursuda	747	416	331	455	168	287
12.	Silpatti	710	414	296	382	158	224
13.	Tandawa	3747	2197	1550	1808	649	1159
14.	Hatband	506	306	200	263	101	162
15.	Ninwa	1289	747	542	646	221	425
16.	Kirna	1923	1094	829	940	365	575
17.	Jalso	587	347	240	345	131	214
18.	Kundru	2952	1619	1333	1064	452	612
19.	Konari	544	320	224	228	83	145
20.	Nakti Khapri	461	260	201	274	105	169
21.	Khamhariya	777	451	326	475	161	314
22.	Sirwe	706	413	293	466	167	299
23.	Rajiya	571	318	253	335	117	218
24.	Bahesar	1128	630	498	566	217	349
25.	Bartori	690	403	287	512	203	309
26.	Chhataud	1339	732	607	880	338	542
27.	Tarasiw	1014	562	452	446	164	282
28.	Ghulghul	586	347	239	272	101	171
29.	Chhapora	835	464	371	352	125	227

S.No.	Village Name	Total population Literates	Male literates	Female literates	Total population illiterates	Male illiterates	Female illiterates
30.	Deori	992	574	418	384	137	247
31.	Khudmudi	607	348	259	362	158	204
32.	Kota	1094	661	433	638	221	417
33.	Kohka	780	428	352	357	123	234
34.	Khapri Khurd	446	256	190	230	77	153
35.	Bhibhauri	942	545	397	504	181	323
36.	Keotara	949	540	409	520	218	302
37.	Gaurkheda	555	311	244	298	114	184
38.	Chicholi	636	345	291	467	194	273
39.	Gaitra	534	312	222	358	144	214
40.	Raikheda	2170	1228	942	1371	506	865
41.	Kodawa	964	548	416	418	149	269
42.	Bartori 2	998	563	435	575	206	369
43.	Sontara	710	409	301	374	134	240
44.	Deogaon	744	423	321	501	190	311
45.	Khauna	2250	1297	953	1495	597	898
46.	Mura	1394	789	605	965	399	566
47.	Dhansuli	727	404	323	514	203	311
48.	Tilda	25587	14135	11452	11095	4309	6786
49.	Tulsi	3003	1691	1312	1289	505	784
50.	Sinodha	1306	714	592	805	309	496

**WORKERS CLASSIFICATION AS PER CENSUS 2011 (MAIN & MARGINAL)**

S.No.	Village Name	TOTAL WORK_P	TOTAL WORK_M	TOTAL WORK_F	MAIN WORK_P	MAIN WORK_M	MAIN WORK_F	MARGINAL WORK_P	MARGINAL WORK_M	MARGINAL WORK_F
1.	Bhatapara	353	202	151	352	202	150	1	0	1
2.	Mauhagaon	425	298	127	156	130	26	269	168	101
3.	Malaud	665	438	227	522	380	142	143	58	85
4.	Silyari Kurud	2800	1893	907	1868	1470	398	932	423	509
5.	Mehar Sakha	301	209	92	139	128	11	162	81	81
6.	Kuthrel	640	348	292	505	318	187	135	30	105
7.	Bhatgaon	446	363	83	383	328	55	63	35	28
8.	Biladi	1456	891	565	1107	718	389	349	173	176
9.	Parsada	582	375	207	523	342	181	59	33	26
10.	Jota	503	308	195	354	235	119	149	73	76
11.	Bhursuda	590	312	278	585	311	274	5	1	4
12.	Silpatti	456	294	162	429	290	139	27	4	23
13.	Tandawa	2188	1442	746	1237	963	274	951	479	472
14.	Hatband	449	247	202	185	149	36	264	98	166
15.	Ninwa	883	486	397	591	350	241	292	136	156
16.	Kirna	1239	816	423	1069	733	336	170	83	87
17.	Jalso	561	289	272	305	203	102	256	86	170
18.	Kundru	1568	1126	442	1355	1072	283	213	54	159
19.	Konari	348	201	147	340	197	143	8	4	4
20.	Nakti Khapri	216	174	42	92	82	10	124	92	32
21.	Khamhariya	633	322	311	470	253	217	163	69	94
22.	Sirwe	594	312	282	325	270	55	269	42	227
23.	Rajiya	411	231	180	303	201	102	108	30	78
24.	Bahesar	764	466	298	603	423	180	161	43	118
25.	Bartori	467	305	162	251	178	73	216	127	89
26.	Chhataud	1024	572	452	703	410	293	321	162	159
27.	Tarasiw	654	413	241	425	290	135	229	123	106
28.	Ghulghul	484	266	218	383	234	149	101	32	69
29.	Chhapora	483	303	180	373	227	146	110	76	34
30.	Deori	496	357	139	423	312	111	73	45	28

S.No.	Village Name	TOTAL WORK_P	TOTAL WORK_M	TOTAL WORK_F	MAIN WORK_P	MAIN WORK_M	MAIN WORK_F	MARGINAL WORK_P	MARGINAL WORK_M	MARGINAL WORK_F
31.	Khudmudi	293	231	62	136	123	13	157	108	49
32.	Kota	752	435	317	654	405	249	98	30	68
33.	Kohka	465	302	163	455	298	157	10	4	6
34.	Khapri Khurd	372	195	177	312	163	149	60	32	28
35.	Bhibhauri	653	391	262	566	368	198	87	23	64
36.	Keotara	746	392	354	491	286	205	255	106	149
37.	Gaurkheda	394	247	147	250	194	56	144	53	91
38.	Chicholi	532	289	243	242	142	100	290	147	143
39.	Gaitra	483	247	236	455	240	215	28	7	21
40.	Raikheda	1650	988	662	1189	906	283	461	82	379
41.	Kodawa	476	369	107	166	157	9	310	212	98
42.	Bartori 2	848	450	398	247	163	84	601	287	314
43.	Sontara	517	305	212	56	48	8	461	257	204
44.	Deogaon	549	318	231	48	41	7	501	277	224
45.	Khauna	1695	994	701	1451	889	562	244	105	139
46.	Mura	1065	594	471	417	357	60	648	237	411
47.	Dhansuli	560	310	250	346	248	98	214	62	152
48.	Tilda	13078	9870	3208	10889	8723	2166	2189	1147	1042
49.	Tulsi	1500	1130	370	1241	992	249	259	138	121
50.	Sinodha	848	515	333	686	437	249	162	78	84

**CULTIVATORS CLASSIFICATION AS PER CENSUS 2011 (MAIN & MARGINAL)**

S.No.	Village Name	MAIN_CL_P	MAIN_CL_M	MAIN_CL_F	MARG_CL_P	MARG_CL_M	MARG_CL_F
1.	Bhatapara	206	141	65	0	0	0
2.	Mauhagaon	32	26	6	35	24	11
3.	Malaud	151	97	54	11	4	7
4.	Silyari Kurud	253	204	49	80	37	43
5.	Mehar Sakha	50	45	5	2	1	1
6.	Kuthrel	27	27	0	5	3	2
7.	Bhatgaon	24	24	0	5	4	1
8.	Biladi	124	88	36	37	24	13
9.	Parsada	137	90	47	8	7	1
10.	Jota	100	67	33	11	4	7
11.	Bhursuda	199	117	82	0	0	0
12.	Silpatti	145	122	23	0	0	0
13.	Tandawa	220	114	106	104	61	43
14.	Hatband	89	71	18	121	43	78
15.	Ninwa	219	111	108	5	2	3
16.	Kirna	117	106	11	9	9	0
17.	Jalso	75	59	16	73	10	63
18.	Kundru	25	19	6	9	2	7
19.	Konari	112	52	60	0	0	0
20.	Nakti Khapri	39	38	1	4	1	3
21.	Khamhariya	95	54	41	2	0	2
22.	Sirwe	100	76	24	23	3	20
23.	Rajiya	56	40	16	33	9	24
24.	Bahesar	105	52	53	37	7	30
25.	Bartori	17	12	5	0	0	0
26.	Chhataud	192	102	90	29	13	16
27.	Tarasiw	153	94	59	61	21	40
28.	Ghulghul	68	51	17	2	0	2
29.	Chhapora	93	74	19	2	1	1
30.	Deori	94	76	18	1	1	0

S.No.	Village Name	MAIN_CL_P	MAIN_CL_M	MAIN_CL_F	MARG_CL_P	MARG_CL_M	MARG_CL_F
31.	Khudmudi	61	56	5	1	1	0
32.	Kota	161	95	66	2	0	2
33.	Kohka	89	53	36	3	3	0
34.	Khapri Khurd	151	79	72	8	3	5
35.	Bhibhauri	169	102	67	13	4	9
36.	Keotara	140	75	65	42	16	26
37.	Gaurkheda	162	123	39	3	2	1
38.	Chicholi	26	17	9	64	32	32
39.	Gaitra	148	78	70	12	4	8
40.	Raikheda	480	331	149	109	41	68
41.	Kodawa	16	16	0	28	25	3
42.	Bartori 2	93	53	40	12	8	4
43.	Sontara	21	19	2	14	13	1
44.	Deogaon	12	12	0	62	33	29
45.	Khauna	283	183	100	76	19	57
46.	Mura	49	44	5	41	24	17
47.	Dhansuli	61	44	17	12	5	7
48.	Tilda	299	227	72	39	23	16
49.	Tulsi	104	76	28	11	6	5
50.	Sinodha	104	57	47	4	2	2

**NOTE:**

MAIN CL P	MAIN CULTIVATORS POPULATION
MAIN CL M	MAIN CULTIVATORS MALE
MAIN CL F	MAIN CULTIVATORS FEMALE
MARG CL P	MARGINAL CULTIVATORS POPULATION
MARG CL M	MARGINAL CULTIVATORS MALE
MARG CL F	MARGINAL CULTIVATORS FEMALE

**AGRICULTURAL LABOURS CLASSIFICATION AS PER CENSUS 2011 (MAIN & MARGINAL)**

S.No.	Village Name	MAIN_AL_P	MAIN_AL_M	MAIN_AL_F	MARG_AL_P	MARG_AL_M	MARG_AL_F
1.	Bhatapara	110	29	81	1	0	1
2.	Mauhagaon	30	22	8	209	122	87
3.	Malaud	171	101	70	117	46	71
4.	Silyari Kurud	650	434	216	709	312	397
5.	Mehar Sakha	1	1	0	155	75	80
6.	Kuthrel	308	131	177	106	19	87
7.	Bhatgaon	75	41	34	45	22	23
8.	Biladi	260	130	130	211	94	117
9.	Parsada	257	135	122	32	14	18
10.	Jota	169	98	71	59	11	48
11.	Bhursuda	307	125	182	4	0	4
12.	Silpatti	219	110	109	25	3	22
13.	Tandawa	285	172	113	630	251	379
14.	Hatband	64	46	18	128	50	78
15.	Ninwa	214	98	116	270	122	148
16.	Kirna	578	294	284	130	48	82
17.	Jalso	135	59	76	165	62	103
18.	Kundru	423	247	176	162	25	137
19.	Konari	146	70	76	7	3	4
20.	Nakti Khapri	1	1	0	79	55	24
21.	Khamhariya	166	69	97	157	66	91
22.	Sirwe	74	52	22	235	31	204
23.	Rajiya	190	105	85	71	20	51
24.	Bahesar	179	89	90	84	3	81
25.	Bartori	142	78	64	210	121	89
26.	Chhataud	325	145	180	268	130	138
27.	Tarasiw	127	67	60	160	94	66
28.	Ghulghul	151	57	94	44	13	31
29.	Chhapora	228	109	119	107	75	32

S.No.	Village Name	MAIN_AL_P	MAIN_AL_M	MAIN_AL_F	MARG_AL_P	MARG_AL_M	MARG_AL_F
30.	Deori	171	86	85	72	44	28
31.	Khudmudi	24	20	4	152	103	49
32.	Kota	351	193	158	83	22	61
33.	Kohka	321	203	118	7	1	6
34.	Khapri Khurd	140	65	75	12	3	9
35.	Bhibhauri	247	144	103	65	12	53
36.	Keotara	266	143	123	204	83	121
37.	Gaurkheda	64	52	12	140	50	90
38.	Chicholi	159	79	80	216	107	109
39.	Gaitra	234	110	124	13	2	11
40.	Raikheda	388	287	101	336	31	305
41.	Kodawa	80	76	4	277	184	93
42.	Bartori 2	90	55	35	573	266	307
43.	Sontara	1	1	0	444	241	203
44.	Deogaon	2	0	2	426	235	191
45.	Khauna	954	521	433	151	77	74
46.	Mura	95	64	31	543	172	371
47.	Dhansuli	195	120	75	193	49	144
48.	Tilda	454	259	195	452	159	293
49.	Tulsi	96	45	51	88	19	69
50.	Sinodha	251	127	124	91	34	57

**NOTE:**

MAIN AL P	MAIN AGRICULTURAL LABOR POPULATION
MAIN AL M	MAIN AGRICULTURAL LABOR MALE
MAIN AL F	MAIN AGRICULTURAL LABOR FEMALE
MARG AL P	MARGINAL AGRICULTURAL LABOR POPULATION
MARG AL M	MARGINAL AGRICULTURAL LABOR MALE
MARG AL F	MARGINAL AGRICULTURAL LABOR FEMALE

**HOUSEHOLD INDUSTRY WORKERS CLASSIFICATION AS PER CENSUS 2011 (MAIN & MARGINAL)**

S.No.	Village Name	MAIN_HH_P	MAIN_HH_M	MAIN_HH_F	MARG_HH_P	MARG_HH_M	MARG_HH_F
1.	Bhatapara	0	0	0	0	0	0
2.	Mauhagaon	0	0	0	0	0	0
3.	Malaud	6	6	0	7	4	3
4.	Silyari Kurud	96	72	24	19	8	11
5.	Mehar Sakha	0	0	0	0	0	0
6.	Kuthrel	3	2	1	10	3	7
7.	Bhatgaon	1	1	0	0	0	0
8.	Biladi	14	10	4	5	2	3
9.	Parsada	8	8	0	2	1	1
10.	Jota	0	0	0	0	0	0
11.	Bhursuda	1	1	0	0	0	0
12.	Silpatti	0	0	0	0	0	0
13.	Tandawa	19	17	2	10	5	5
14.	Hatband	0	0	0	0	0	0
15.	Ninwa	7	6	1	1	1	0
16.	Kirna	6	6	0	1	1	0
17.	Jalso	0	0	0	0	0	0
18.	Kundru	6	5	1	3	1	2
19.	Konari	5	4	1	0	0	0
20.	Nakti Khapri	2	2	0	0	0	0
21.	Khamhariya	9	3	6	0	0	0
22.	Sirwe	0	0	0	3	2	1
23.	Rajiya	1	1	0	1	0	1
24.	Bahesar	5	5	0	0	0	0
25.	Bartori	3	3	0	0	0	0
26.	Chhataud	13	7	6	7	4	3
27.	Tarasiw	0	0	0	0	0	0
28.	Ghulghul	4	4	0	0	0	0
29.	Chhapora	0	0	0	0	0	0
30.	Deori	0	0	0	0	0	0
31.	Khudmudi	2	2	0	0	0	0

S.No.	Village Name	MAIN_HH_P	MAIN_HH_M	MAIN_HH_F	MARG_HH_P	MARG_HH_M	MARG_HH_F
32.	Kota	27	20	7	7	2	5
33.	Kohka	2	2	0	0	0	0
34.	Khapri Khurd	1	1	0	16	6	10
35.	Bhibhauri	5	2	3	2	2	0
36.	Keotara	9	6	3	1	1	0
37.	Gaurkheda	11	10	1	0	0	0
38.	Chicholi	1	1	0	0	0	0
39.	Gaitra	5	3	2	0	0	0
40.	Raikheda	3	3	0	0	0	0
41.	Kodawa	6	6	0	1	0	1
42.	Bartori 2	10	10	0	3	2	1
43.	Sontara	2	1	1	1	1	0
44.	Deogaon	0	0	0	6	3	3
45.	Khauna	7	5	2	0	0	0
46.	Mura	2	2	0	0	0	0
47.	Dhansuli	1	1	0	0	0	0
48.	Tilda	435	333	102	85	30	55
49.	Tulsi	38	26	12	1	0	1
50.	Sinodha	0	0	0	2	0	2

**NOTE:**

MAIN HH P	MAIN HOUSE HOLDERS POPULATION
MAIN HH M	MAIN HOUSE HOLDERS MALE
MAIN HH F	MAIN HOUSE HOLDERS FEMALE
MARG HH P	MARGINAL HOUSE HOLDERS POPULATION
MARG HH M	MARGINAL HOUSE HOLDERS MALE
MARG HH F	MARGINAL HOUSE HOLDERS FEMALE

**OTHER WORKERS CLASSIFICATION AS PER CENSUS 2011 (MAIN & MARGINAL)**

S.No.	Village Name	MAIN_OT_P	MAIN_OT_M	MAIN_OT_F	MARG_OT_P	MARG_OT_M	MARG_OT_F
1.	Bhatapara	36	32	4	0	0	0
2.	Mauhagaon	94	82	12	25	22	3
3.	Malaud	194	176	18	8	4	4
4.	Silyari Kurud	869	760	109	124	66	58
5.	Mehar Sakha	88	82	6	5	5	0
6.	Kuthrel	167	158	9	14	5	9
7.	Bhatgaon	283	262	21	13	9	4
8.	Biladi	709	490	219	96	53	43
9.	Parsada	121	109	12	17	11	6
10.	Jota	85	70	15	79	58	21
11.	Bhursuda	78	68	10	1	1	0
12.	Silpatti	65	58	7	2	1	1
13.	Tandawa	713	660	53	207	162	45
14.	Hatband	32	32	0	15	5	10
15.	Ninwa	151	135	16	16	11	5
16.	Kirna	368	327	41	30	25	5
17.	Jalso	95	85	10	18	14	4
18.	Kundru	901	801	100	39	26	13
19.	Konari	77	71	6	1	1	0
20.	Nakti Khapri	50	41	9	41	36	5
21.	Khamhariya	200	127	73	4	3	1
22.	Sirwe	151	142	9	8	6	2
23.	Rajiya	56	55	1	3	1	2
24.	Bahesar	314	277	37	40	33	7
25.	Bartori	89	85	4	6	6	0
26.	Chhataud	173	156	17	17	15	2
27.	Tarasiw	145	129	16	8	8	0
28.	Ghulghul	160	122	38	55	19	36
29.	Chhapora	52	44	8	1	0	1
30.	Deori	158	150	8	0	0	0
31.	Khudmudi	49	45	4	4	4	0

S.No.	Village Name	MAIN_OT_P	MAIN_OT_M	MAIN_OT_F	MARG_OT_P	MARG_OT_M	MARG_OT_F
32.	Kota	115	97	18	6	6	0
33.	Kohka	43	40	3	0	0	0
34.	Khapri Khurd	20	18	2	24	20	4
35.	Bhibhauri	145	120	25	7	5	2
36.	Keotara	76	62	14	8	6	2
37.	Gaurkheda	13	9	4	1	1	0
38.	Chicholi	56	45	11	10	8	2
39.	Gaitra	68	49	19	3	1	2
40.	Raikheda	318	285	33	16	10	6
41.	Kodawa	64	59	5	4	3	1
42.	Bartori 2	54	45	9	13	11	2
43.	Sontara	32	27	5	2	2	0
44.	Deogaon	34	29	5	7	6	1
45.	Khauna	207	180	27	17	9	8
46.	Mura	271	247	24	64	41	23
47.	Dhansuli	89	83	6	9	8	1
48.	Tilda	9701	7904	1797	1613	935	678
49.	Tulsi	1003	845	158	159	113	46
50.	Sinodha	331	253	78	65	42	23

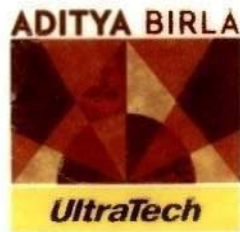
**NOTE:**

MAIN OT P	MAIN OTHER WORKERS POPULATION
MAIN OT M	MAIN OTHER WORKERS MALE
MAIN OT F	MAIN OTHER WORKERS FEMALE
MARG OT P	MARGINAL OTHER WORKERS POPULATION
MARG OT M	MARGINAL OTHER WORKERS MALE
MARG OT F	MARGINAL OTHER WORKERS FEMALE

**NON-WORKERS CLASSIFICATION AS PER CENSUS 2011**

S.No.	Village Name	NON_WORK_P	NON_WORK_M	NON_WORK_F
1.	Bhatapara	359	155	204
2.	Mauhagaon	830	330	500
3.	Malaud	1153	479	674
4.	Silyari Kurud	4163	1600	2563
5.	Mehar Sakha	478	193	285
6.	Kuthrel	564	257	307
7.	Bhatgaon	1053	391	662
8.	Biladi	1803	738	1065
9.	Parsada	835	328	507
10.	Jota	575	229	346
11.	Bhursuda	612	272	340
12.	Silpatti	636	278	358
13.	Tandawa	3367	1404	1963
14.	Hatband	320	160	160
15.	Ninwa	1052	482	570
16.	Kirna	1624	643	981
17.	Jalso	371	189	182
18.	Kundru	2448	945	1503
19.	Konari	424	202	222
20.	Nakti Khapri	519	191	328
21.	Khamhariya	619	290	329
22.	Sirwe	578	268	310
23.	Rajiya	495	204	291
24.	Bahesar	930	381	549
25.	Bartori	735	301	434
26.	Chhataud	1195	498	697
27.	Tarasiw	806	313	493
28.	Ghulghul	374	182	192
29.	Chhapora	704	286	418
30.	Deori	880	354	526
31.	Khudmudi	676	275	401

S.No.	Village Name	NON_WORK_P	NON_WORK_M	NON_WORK_F
32.	Kota	980	447	533
33.	Kohka	672	249	423
34.	Khapri Khurd	304	138	166
35.	Bhibhauri	793	335	458
36.	Keotara	723	366	357
37.	Gaurkheda	459	178	281
38.	Chicholi	571	250	321
39.	Gaitra	409	209	200
40.	Raikheda	1891	746	1145
41.	Kodawa	906	328	578
42.	Bartori 2	725	319	406
43.	Sontara	567	238	329
44.	Deogaon	696	295	401
45.	Khauna	2050	900	1150
46.	Mura	1294	594	700
47.	Dhansuli	681	297	384
48.	Tilda	23604	8574	15030
49.	Tulsi	2792	1066	1726
50.	Sinodha	1263	508	755



To,  
**M/s Vikas Metaliks & Energy Ltd.**  
 Vill- Bartori, Tahsil- Tilda  
**Raipur (C.G.)**

Date: 29.01.2018

Kind Attention: Mr. Manoj Kumar

**Sub: Expression of interest (EOI) for procurement of Fly Ash generated from your proposed integrated steel plant at Tilda.**

Dear Sir,

With reference to your letter dtd 23.01.2018 <sup>regarding</sup> Fly Ash generation from your proposed integrated steel plant at Vill- Bartori, Tilda, Dist- Raipur (C.G.).

We confirm our EOI for procurement of Dry Fly Ash generated from your proposed steel plant for our Cement Plant subject to landed cost economics.

Therefore, please arrange to send us detailed commercial proposed to call on us for further discussion on mutual basis.

Thanking you,

Yours faithfully,

For **UltraTech Cement Limited,**  
 (Unit: Rawan Cement Works)

**Manoj Bagrodia**  
**General Manager (Material)**



UltraTech Cement Limited  
 (Unit : Rawan Cement Works)

P.O.: Grasim Vihar, Vill.: Rawan, Distt.: Baloda Bazar-Bhatapara - 493 196 (C.G.), Phone : 07726-288217-220, Fax : 07726-288215  
 CIN : L26940MH2000PLC128420



ISO 9001 : 2000 COMPANY



## **VIKAS METALIKS & ENERGY LTD.**

F-4, 1st Floor, Modern Complex,  
Motibagh Chowk, Raipur - 492 001 (C.G.)  
Ph : (0771) 2236690, 3294290, Fax : 2236690,  
E-mail : vspower@rediffmail.com

CIN:-U27102CT2004PLC017119

### **CORPORATE ENVIRONMENTAL POLICY**

The "VIKAS METALIKS & ENERGY LIMITED" is committed for its contribution to the upliftment of the Society, is forever committed to protect and save the Environment, keeping in mind the Sustainable Development.

Resolution: VIKAS METALIKS & ENERGY LIMITED on 5<sup>th</sup> day of April, 2018, the Management has taken a decision on Environment Policy, that it is committed to operate the Steel Plant at Village Bartori, Tehsil Tilda, District Raipur, Chhattisgarh with the following objectives.

The top management of the company pledges to ensure

- A clean/ green and safe Environment in and around its places of operation by providing all pollution control measures at all stages of its projects and operations
- Compliance with not only all the regulatory and statutory requirements but also going beyond the prescribed norms, adopting more stringent international standards
- Adoption of International Environmental Management Systems, Cleaner and latest Technologies to protect the Environment
- Organizational Structure and processes to guide, plan and implement all Environmental related activities and conservation measures for fuels, water and energy
- Sufficient resources of funds, human and technology apart from infrastructure facilities
- Training to all employees including contract workmen and nearby society to provide input on Environmental Upgradation Techniques and inculcate a culture of self regulation and ownership
- Monitoring and Reporting of Environmental performances / non-compliances / deviations for Review and Guidance by top management
- Recognition and Reward schemes to motivate employees
- Sharing of Environmental Performance with all Stake holders through Annual Report / Press Releases / Media
- Communication of the policy to all employees including contract workmen for implementation

### **Corporate Social Responsibility Policy**

As a Corporate Organization we believe that it is our primary purpose to give back to society. Giving and sharing what we have received is embedded deeply in us. We will actively pursue to raise the quality of life of the people around us. We hold hands in our joint effort to create better tomorrows.



ISO 9001 : 2000 COMPANY



## VIKAS METALIKS & ENERGY LTD.

F-4, 1st Floor, Modern Complex,  
Motibagh Chowk, Raipur - 492 001 (C.G.)  
Ph : (0771) 2236690, 3294290, Fax : 2236690,  
E-mail : vspower@rediffmail.com  
CIN:-U27102CT2004PLC017119

### Occupational Health & Safety Policy

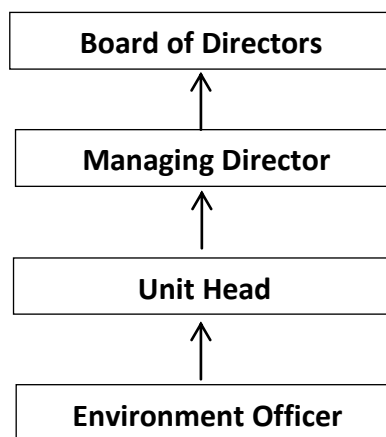
We follow the occupational health and safety policy as below

- Create an environment which is safe and secure for everyone in its vicinity, be it a worker, contractor, visitor and even the local community. All identifiable risks and hazards are treated with the gravest concern.
- To constantly endeavour towards the highest level of health and safety such that injuries, waste and emissions are reduced to the bare minimum.
- Train all employees to work safely and responsibly thus preventing injury to themselves and others.
- Ensure that optimum conditions exist for the proper execution of all the stipulated health and safety norms.

### Hierarchy to implement Environment Policy

An Environmental Officer will be appointed to look after all environmental issues and ensure compliance with Environmental Clearance conditions / CECB norms and will report to Unit Head who ultimately will report to Managing Director. Subsequently it will be discussed in the Board meeting and it will be made aware of the Environmental Policy and compliance on Environmental Clearance / CECB norms to all. Any non-compliance / deviations will be brought to the notice of the Managing Director and subsequently to Board of Directors. Necessary fund allocation for closure of NCs will be approved in the Board of Directors meeting and accordingly corrective measures will be taken up on priority basis.

The following will be the organisation chart pertaining to Environment Policy.



Place : Raipur

Date : 05.04.2018

  
(UMESH SHARMA)  
Managing Director

**MEMORANDUM OF UNDERSTANDING**

FOR

**SUPPLY OF IMPORTED COAL**

BETWEEN

**INDERMANI MINERAL(INDIA) PVT. LTD**

AND

**VIKAS METALIKS AND ENERGY LTD**

**Dated: 1<sup>st</sup> MAY 2017**

## MEMORANDUM OF UNDERSTANDING

This Memorandum of understanding (MOU) is made on this 1<sup>st</sup> day of May 2017.

**M/s INDERMANI MINERAL ( INDIA ) PVT LTD** , hereinafter called the "**SELLER**" ( which expression shall unless excluded by or repugnant to the subject or context , include its legal representatives , successors and permitted assigns ) of the one part.

And

M/s **VIKAS METALIKS & ENERGY LTD** , a Company registered under the companies act 1956 and having its registered office at F-4 , Modern Complex , Moti Bagh Chowk , Raipur -492001(C.G.)hereinafter called the "**PURCHASER**" ( Which term shall unless excluded or repugnant to the subject or context include its legal representatives, heirs , successors and permitted assigns ) of the other part .

### 1. SELLER

M/s INDERMANI MINERAL(INDIA) PVT. LTD

### 2. PURCHASER

M/s Vikas Metaliks & Energy Ltd

F-4 , Modern Complex

Moti Bagh Chowk

Raipur-492001(C.G.)

### 3. PRODUCT

Imported Coal

### 4. QUANTITY

100000 Tons/years+/- 15% at seller's Option

Indermani Mineral (I) Pvt. Ltd.

For, Vikas Metaliks & Energy Ltd;

  
Director.



Director

## 5. SHIPMENT

Once in two months .

CNF Vizag Port Trust , Visakhapatnam , with ultimate destination to Vikas Metaliks & Energy Ltd . Tilda , Raipur by rail/ road Transportation.

## 6. QUANTITY DETERMINATION

The quantity of the goods under this contract shall be verified by independent surveyor: mutually agreed at load port to be appointed by seller whose findings shall be final and binding upon both parties .

## 7. TAXES & DUTIES

All taxes and duties incurred in India shall be borne by purchase. Purchaser is solely liable for container detention /demurrage /port ground rent and any other charges with respect as per discharges port. Shipping line will give 5 days free detention time which is applicable once vessel arrives at Vizag Port, after which detention demurrage is chargeable .

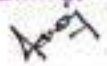
## 8. PRICE

The cost of coal will be prevailing prices CNF Vizag Port , Inland haulage charges from Vizag Port Trust , to Vikas Metaliks & Energy Ltd , Tilda , Raipur on purchase Account.

## 9. SELLING TERM

This transaction shall be on CNF basis as per latest version of incoterms.

*For. Vikas Metaliks & Energy Ltd:*

  
*Director.*

Indermani Mineral (I) Pvt. Ltd.

  
*Director*

## 10. QUALITY

Parameters		Typical Specification
Gross Calorific Value (GCV)	-	4500 TO 5000 Kcal /Kg
Sulfur ,w/f pet	-	0.4% to 0.5%
Volatile Matter ,w/t pet	-	10-14%
Ash w/t pet	-	10% to 15%
Moisture	-	5.0% max.

Seller does not guarantee and warrant that the product supplied under this agreements is merchantable , suitable and fit for any particulars purpose for which the product is purchased for by purchaser except that the product delivered under this agreements shall meet the standard specification . Seller shall convey to the purchase good title to the product free of any encumbrance , lien or security interest . Seller warrants that the product shall conform to the requirement of this agreements'.

## 11. DETAILS OF MOVEMENT TO VISHAKAPATNAM PORT , INDIA

Please not that all charges will be as per billing for Shipping Line / transport operators to your company , Which may increase . Purchase will be responsible for all demurrage on line detention that may occur in India .

### Handling at ICD Vizag Port on Purchase Account .

Any Charges in the above charges will be applicable on arrival at Vizag Port , Trust , Visakhapatnam to be borne by purchase .

## 12. PAYMENT

Payment shall be covered by an irrevocable , transferable letter of credit for full invoice amounts . Purchase is to advise seller name and city of opening bank through which L/C is to be advised . Purchaser to seek seller explicit agreement to the L/C. wording . The L/C is to be issued by a bank acceptable to the seller . The L/C shall be payable at the counter of the advising bank .

Against presentation of following documents for LC negotiation within 14 days after Bill of Lading date :-

- Seller signed & Stamped commercial invoice for 100% value .3 original +3 copies .

For. Vikas Metaliks & Energy Ltd:

*Amit*  
Director.

Indermani Minerals (I) Pvt. Ltd.

*[Signature]*  
Director

- Full set of original , clean on Board Bill of Lading .3 original +3 copies .
- Packing list issued by 2<sup>ND</sup> beneficiary .1 Original +1 copy .
- Certificate of origin issued by a Chamber of Commerce or 2<sup>nd</sup> Beneficiary  
1 Original .

### 13. CONFIDENTIALITY

Seller and Purchaser shall treat this transaction strictly private and confidential and will not release any information concerning this transaction to a third party .

### 14. FORCE MAJEURE

Neither seller nor purchaser shall be liable to other demurrage , loss or damage of any nature whatsoever incurred or suffered by such other party due to delays or default in performance under this agreement caused by circumstances beyond its control and without its fault or negligence including but not restricted to act of god or the public enemy , perils of navigation, flood , fires ,hostilities or war ( declared or undeclared ) , executive or administrative orders or acts either general or particulars of any jure or de facto Government or request of any officer or agents purporting to act under the authority of any such government , illegality arising from applicable domestic or foreign laws or regulation , blockage , labor , disturbances or strikes , riot , civil commotion , quarantine restriction, epidemics , storms , earthquakes , accidents , breakdown or injury to or exploration , confiscation or requisitioning of raw materials or of producing , manufacturing , selling or delivery facilities , unavailability of supplies for any reasons , any change in the characteristics of the petroleum Coke produced from its field in partial or total interruption , loss or shortage of transportation facilities , imposition of restriction or onerous regulation by any government or governmental agency .

### 15. ARBITRATION AND APPLICABLE LAW

All disputes arising out or in connection with this agreement shall to the extent possible to settle amicably by negotiation and discussion between Purchaser and Seller . Any controversy or claims relating to this agreement which cannot be amicably settle by way of negotiation shall be settled by arbitration conducted in this English Language with the law of India .

*For. Vikas Metaliks & Energy Ltd;*

*Amit*  
Director.

Indermani Minerals (I) Pvt. Ltd.

*[Signature]*  
Director

## 16. LIABILITY

The seller shall only be liable to the Purchaser for direct damages . The seller shall not be liable to the Purchaser for any indirect , special or consequential damages however arising in negligence or otherwise out of or in connection with the performance of the Original Agreement including , but without limitation of loss of revenue or loss of profits. Seller's total liabilities or any or all claims from the purchase shall in no event exceed 10% of the price of the coal with respect to which such claims or claims are made .

SIGN IN WITNESS WHERE OF . the parties have executed this MOU as of the date first written above .

**For Vikas Metaliks & Energy Ltd**  
**For. Vikas Metaliks & Energy Ltd;**

  
**Director.**

### Authorized Signatory

#### Name in Block Letter

Name MANOJ KUMAR

Designation DIRECTOR

Address MODERN COMPLEX  
MOTI BAGICHOWK  
RAIPUR-492001 (C.G.)

### Witness



Signature

Name UMESH SHARMA

Address 2nd Flr. Modern Complex  
Hotibagh Chowk  
Raipur (C.G.)

**For Indermani Mineral (India) Pvt. Ltd**  
**Indermani Mineral (I) Pvt. Ltd.**

  
**Director**

### Authorized Signatory

#### Name in Block Letter

Name SUNIL KUMAR AGRAWAL

Designation DIRECTOR

Address ASHWARIA CHAMBER  
TELDANDA RAIPUR-492001 (C.G.)

### Witness



Signature

Name Nareesh Sah

Address Rly Colony  
Tilda, Dist- Raipur  
-----



Government of India  
Central Ground Water Authority (CGWA)  
Ministry of Water Resources, River Development and Ganga Rejuvenation

**Application for Issue of NOC to Abstract Ground Water (NOCAP)**

Welcome : kpanigrahi56

Previous Login Date Time: 27/03/2018 17:42:54 PM , IP Address: 124.123.62.54

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**Location**

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**Industrial**

**New- Save As Draft (Number of Save as Draft Application Allowed at a time : 3)**

**(Validity of Save as Draft Application : 2 Month(s))**

Sr. No.	Name of Industry	Created Date
There is No Save As Draft Application.		

**Renew- Save As Draft**

Sr. No.	Name of Industry	Application Number	Existing NOC	Renewal	Created Date
There is No Save As Draft Application.					

**Submitted : (Count : 1)**

Sr. No.	Name of Industry	Application Number	Status	Digital Signed Letter	Scan Letter	NOC- Number	Apply Type	Renewal
1	M/S VIKASH METALIKS AND ENERGY LIMITED	21-4561 ICT/IND/2017	Approved	<a href="#">Print</a>		CGWA/NOC/IND/ORIG/2018/3370	Online	

1 of 1

3/28/2018, 5:25 PM



Government of India  
Central Ground Water Authority (CGWA)  
Ministry of Water Resources, River Development and Ganga Rejuvenation



**Application for Issue of NOC to Abstract Ground Water (NOCAP)**

Welcome : kpanigrahi56

Previous Login Date Time: 27/03/2018 17:42:54 PM , IP Address: 124.123.62.54

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<p><b>Information</b></p> <p><a href="#">Guidelines</a> <a href="#">Steps for Filling</a> <a href="#">Online Application</a></p> <p><b>Documents Required</b></p> <p><a href="#">Documents Required for Online Application</a></p> <ul style="list-style-type: none"> <li><a href="#">Industrial</a></li> <li><a href="#">Infrastructure</a></li> <li><a href="#">Mining</a></li> </ul> <p><b>Track Status</b></p> <p><a href="#">Application Status</a></p> <ul style="list-style-type: none"> <li><a href="#">Online</a></li> </ul> <p><b>Location</b></p> <p><a href="#">Area Type</a> <a href="#">Regional office</a> <a href="#">Location</a> <a href="#">CGWA</a> <a href="#">Headquarters</a></p> <p><b>Contact Us</b></p> <p><a href="#">Contact</a></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="8" style="text-align: center;"><b>Application Status</b></td> </tr> <tr> <td style="width: 20%;"><b>Application No :</b></td> <td colspan="7">21-4/561/CT/IND/2017</td> </tr> <tr> <td><b>Receive Date :</b></td> <td colspan="7">20/03/2018</td> </tr> <tr> <td><b>Name of Industry :</b></td> <td colspan="7">M/S VIKASH METALIKS AND ENERGY LIMITED</td> </tr> <tr> <td><b>Application Processing Fee :</b></td> <td colspan="7">Rs. 1000.00/- (Rupees One Thousand Only) <b>(Submitted: Yes)</b></td> </tr> <tr> <td><b>Final Status</b></td> <td colspan="7">Approved</td> </tr> </table> <table border="1" style="width: 100%; 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22/01/2018	<b>(Regional Director)</b> Central Ground Water Board North Central Chhattisgarh	<b>(Evaluation Officer)</b> Central Ground Water Authority	<b>(Member Secretary)</b> Central Ground Water Authority	13/03/2018	Forward	Forwarded for approval	450.00	164250.00
13/03/2018	<b>(Evaluation Officer)</b> Central Ground Water Authority	<b>(Member Secretary)</b> Central Ground Water Authority	<b>(Chairman)</b> Central Ground Water Authority	16/03/2018	Forward	Forwarded for approval	450.00	164250.00
16/03/2018	<b>(Member Secretary)</b> Central Ground Water Authority	<b>(Chairman)</b> Central Ground Water Authority	<b>(Evaluation Officer)</b> Central Ground Water Authority	19/03/2018	Approved	NOC approved	450.00	164250.00

**NOC Processing**

Receive Date	From User Name	To User Name	Forwarded User Name	Action Date	Action Internal Status	Action Comment
19/03/2018	<b>(Chairman)</b> Central Ground Water Authority	<b>(Evaluation Officer)</b> Central Ground Water Authority	<b>(Approval Officer)</b> Central Ground Water Authority	19/03/2018	Forward	Draft NOC generated.
19/03/2018	<b>(Evaluation Officer)</b> Central Ground Water Authority	<b>(Approval Officer)</b> Central Ground Water Authority	<b>(Member Secretary)</b> Central Ground Water Authority	20/03/2018	Forward	Draft NOC is in order.
20/03/2018	<b>(Approval Officer)</b> Central Ground Water Authority	<b>(Member Secretary)</b> Central Ground Water Authority	<b>(Member Secretary)</b> Central Ground Water Authority	20/03/2018	Approved	Draft NOC approved.

**NOC Disbursement**

Receive Date	From User Name	To User Name	Forwarded User Name	Action Date	Action Internal Status	Action Comment
20/03/2018	<b>(Member Secretary)</b> Central Ground Water Authority	<b>(Member Secretary)</b> Central Ground Water Authority		20/03/2018	Approved	NOC approved.

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## लोक सुनवाई का विवरण

**विषय :-** ई.आई.ए. अधिसूचना दिनांक 14.09.2008 के प्रावधानों के अनुसार मे० विकास मेटलिक्स एण्ड एनर्जी लिमिटेड द्वारा ग्राम बरतोरी, तहसील-तिल्दा, जिला-रायपुर (छ.ग.) में प्रस्तावित स्पंज ऑयसन प्लांट क्षमता-1,20,000 टन/वर्ष, इण्डक्शन फर्नेस विथ सी.सी.एम. एण्ड एलआरएफ क्षमता-1,35,000 टन/वर्ष, रोलिंग मिल क्षमता-90,000 टन/वर्ष, वेस्ट हीट रिकवरी बेस्ड पॉवर प्लांट क्षमता-08 मेगावॉट, एफ.बी.सी. बेस्ड पॉवर प्लांट क्षमता-08 मेगावॉट के पर्यावरणीय स्वीकृति हेतु दिनांक 27.11.2017 को आयोजित लोक सुनवाई का विवरण।

मे० विकास मेटलिक्स एण्ड एनर्जी लिमिटेड द्वारा ग्राम बरतोरी, तहसील-तिल्दा, जिला-रायपुर (छ.ग.) में प्रस्तावित स्पंज ऑयसन प्लांट क्षमता-1,20,000 टन/वर्ष, इण्डक्शन फर्नेस विथ सी.सी.एम. एण्ड एलआरएफ क्षमता-1,35,000 टन/वर्ष, रोलिंग मिल क्षमता-90,000 टन/वर्ष, वेस्ट हीट रिकवरी बेस्ड पॉवर प्लांट क्षमता-08 मेगावॉट, एफ.बी.सी. बेस्ड पॉवर प्लांट क्षमता-08 मेगावॉट हेतु पर्यावरणीय अनुमति प्राप्त करने के लिये लोक सुनवाई कराने बाबत छ. ग. पर्यावरण संरक्षण मण्डल में आवेदन किया गया। दैनिक भास्कर तथा हिन्दुस्तान टाइम्स (दिल्ली) समाचार पत्रों के मुख्य संस्करण में लोक सुनवाई की सूचना प्रकाशित कर दिनांक 27.11.2017 (सोमवार) को प्रातः 11:30 बजे ग्राम बरतोरी, तहसील-तिल्दा, जिला-रायपुर के प.ह.न.-13, मेसर्स विकास मेटलिक्स एण्ड एनर्जी लिमिटेड के नाम से स्थित भूखण्ड खसरा नं. 149/16, 20, 21, 25 एवं अन्य पर सुनवाई नियत की गई, जिसकी सूचना संकथित ग्राम पंचायत को प्रेषित की गई।

प्रस्तावित परियोजना के पर्यावरणीय स्वीकृति बाबत दिनांक 27.11.2017 को श्री कडू ए. खान, अपर कलेक्टर, जिला रायपुर की अध्यक्षता में लोक सुनवाई सम्पन्न हुई। लोक सुनवाई के दौरान श्री प्रकाश रबड़े, वैज्ञानिक, क्षेत्रीय कार्यालय छ.ग. पर्यावरण संरक्षण मंडल, रायपुर, उद्योग प्रतिनिधि श्री उमेश शर्मा तथा लगभग 100 जनसामान्य उपस्थित थे। लोक सुनवाई का कार्यवाही विवरण निम्नानुसार है :-

1. लोक सुनवाई प्रातः 11:40 बजे प्रारंभ की गई।
2. सर्वप्रथम उपस्थित लोगों की उपस्थिति दर्ज कराने की प्रक्रिया आरंभ की गई। जिन लोगों द्वारा उपस्थिति पत्रक पर हस्ताक्षर किये गये हैं, उनकी सूची संलग्नक-2 अनुसार है।
3. श्री प्रकाश रबड़े, वैज्ञानिक, क्षेत्रीय कार्यालय छ.ग. पर्यावरण संरक्षण मंडल, रायपुर ने प्रस्तावित परियोजना की लोक सुनवाई के संबंध में जानकारी देते हुये अपर कलेक्टर महोदय से जन सुनवाई प्रारंभ करने का निवेदन किया।
4. अपर कलेक्टर महोदय ने प्रस्तावित परियोजना हेतु लोक सुनवाई आरंभ करने की घोषणा की तथा परियोजना प्रस्तावक को परियोजना के संबंध में विवरण देने हेतु निर्देशित किया।
5. परियोजना प्रस्तावक की ओर से श्री सुधीर सिंह, वरिष्ठ प्रबंधक, मे० परमोनिथर इन्व्यासरो लैबोरेटरीज एवं कन्सल्टेंट्स प्रा. लिमिटेड, हैदराबाद द्वारा परियोजना के संबंध में प्रस्तुतीकरण दिया गया। उन्होंने बताया कि, ग्राम बरतोरी, तहसील-तिल्दा, जिला रायपुर (छ.ग.) में समाग्रहित रेटेल उत्पादन इकाई का लगाया जाना प्रस्तावित है। इस परियोजना में स्पंज आयरन इकाई (120000 टन प्रति वर्ष), सी.सी.एम. एवं एल.आर.एफ.युनिट इण्डक्शन फर्नेस इकाई (135000 टन प्रति वर्ष), रोलिंग मिल (90000 टन प्रति वर्ष), लव्ल्यू.एच.आर.पी. आधारित पिला उत्पादन इकाई (8 मेगावॉट) तथा एफ.बी.सी. आधारित विद्युत उत्पादन इकाई (8 मेगावॉट) का लगाया जाना प्रस्तावित है। प्रस्तावित परियोजना

को 34.28 एकड़ भूमि पर लगाया जावेगा। प्रस्तावित परियोजना के लिए विद्यमान पर्यावरण नियमानुसार हमने केंद्रीय पर्यावरण एवं वन मंत्रालय को पर्यावरणीय स्वीकृति हेतु आवेदन किया गया। इसी तारतम्य में यह लोक भुनवाई आयोजित की गई है। हमारे द्वारा वायु प्रदूषण की रोकथाम के लिए स्पंज आयरन इकाई इलेक्ट्रोस्टैटिक प्रेसिपिटेटर, स्टील मैल्टिंग शॉप (इन्डक्शन फर्नेस) में बैग फिल्टर युक्त फ्यूम एक्सट्रैक्शन सिस्टम तथा पावर प्लांट में इलेक्ट्रोस्टैटिक प्रेसिपिटेटर लगाए जावेंगे। प्रस्तावित परियोजना के लिए अनुमानित जल की खपत 450 घनमीटर प्रतिदिन होगी। जिसमें परियोजना में उपयोग होने वाले औद्योगिक भेकअप एवं घरेलु जल की आपूर्ति सम्मिलित है। अनुमानित जल की पूर्ति भू-जल स्रोत से किया जाना प्रस्तावित है। तथा हेतु केंद्रीय भू-जल प्राधिकरण से अनुमति लेने बाबत आवेदन किया गया है। प्रक्रिया से उत्पन्न होने वाला दूषित जल को पूर्णतः प्रक्रिया में पुनर्चक्रित कर लिया जावेगा तथा पावर प्लांट में एयर कूल्ड कन्डेंसर स्थापित किया जाना प्रस्तावित है जिसके कारण जल खपत में पर्याप्त कमी आवेगी। चूकी प्रक्रिया से उत्पन्न होने वाला दूषित जल को पूर्णतः प्रक्रिया में पुनर्चक्रित कर लिया जावेगा जिससे आसपास के पर्यावरण पर दूषित जल का नकारात्मक प्रभाव नहीं होगा। प्रस्तावित परिसर में लगभग 11.3 एकड़ भूमि पर सघन वृक्षारोपण का प्रस्ताव है। संपूर्ण परिसर के चारों ओर 10 मीटर चौड़ी हरित पट्टिका का विकास किया जाना प्रस्तावित है। जिससे पर्यावरण संरक्षण में मदद होगी। हमारे द्वारा प्रस्तावित परियोजना में आसपास के लोगों को योग्यतानुसार रोजगार दिया जावेगा। सामाजिक दायित्व के निर्वहन नियमानुसार एवं आवश्यकतानुसार किया जावेगा। प्रस्तावित परियोजना में प्रदूषण की रोकथाम हेतु पर्यावरण एवं वन मंत्रालय एवं छत्तीसगढ़ पर्यावरण संरक्षण मण्डल द्वारा सुझाये गये सभी उपायों को अपनाया जावेगा जिससे परियोजना द्वारा निकटस्थ क्षेत्रों में नकारात्मक प्रभाव नहीं होंगे।

6. श्री प्रकाश खड्गे, वैज्ञानिक क्षेत्रीय कार्यालय छ.ग. पर्यावरण संरक्षण मंडल, रायपुर ने जनसामान्य से इस परियोजना से संबंधित अपना विचार रखने, तथा इस संबंध में राय तथा जनसामान्य के लिखित एवं मौखिक सुझाव एवं आपत्ति आमंत्रित की तथा आश्चस्त किया कि जनसुनवाई की विडियोग्राफी भी हो रही है।

तत्पश्चात उपस्थित लोगों द्वारा उनके विचार व्यक्त करने की प्रक्रिया आरंभ की गई। विवरण निम्नानुसार है :-

1. डॉ० कुंभ डहरिया, सरपंच ग्राम पंचायत बरतौरी ने कहा कि, मैं गांव वालों को बताना चाहता हूँ कि, जी.एम.आर. उद्योग के आने से फसल बर्बाद हो गई है। विकास मेटेलिक्स के आने से हमारी फसल बर्बाद हो जायेगी। सिलतरा आदि में लोगों की 90 प्रतिशत फसल बर्बाद हो गई है, जी.एम.आर. उद्योग में लोगों की जमीन बहुत कम दर पर ली गई है, सभी गांव वालों को गंभीरता से सोचना है। विकास मेटेलिक्स के धुये से फसल खराब होने की आशंका है। योग्यता के अनुरूप रोजगार दिये जाने तथा धुये के संग्रह में एग्रीमेंट होना चाहिये। बहुत जगहों पर देखा गया है कि, उद्योग द्वारा गांव वालों को ठगा जाता है।
2. श्री ओम प्रकाश टाकुर, ग्राम बरतौरी ने कहा कि, उद्योग जो लगाना जाता है, किंतु स्थानीय लोगों को रोजगार नहीं मिलता, उद्योग लगने के बाद बहरी लोगों को रोजगार दिया जाता है। इस संबंध में एग्रीमेंट होना चाहिये कि स्थानीय लोगों को रोजगार मिले। उद्योग से प्रदूषण बहुत होता है, अतः पहले वृक्षारोपण किया जाना चाहिये।
3. श्री लालन चौहान, ग्राम डहेसर ने कहा कि, गांव के तालाब, कुओ आदि का पानी खराब नहीं होना चाहिये। काली धूल गिरने से घर की छत, जल स्रोत खराब नहीं होंगे चाहिये।

- 4 श्री साहेब दास भानिकपुरी, ग्राम बरतोरी ने कहा कि छत्तोसगढ में बहुत सारे उद्योग स्थापित हैं, जिस समय लोक सुनवाई होती है, तब उद्योगों द्वारा सभी व्यवस्था किये जान की बात कही जाती है। लोक सुनवाई के पश्चात उद्योगों में काम शुरू होने के बाद श्रमिकों को भुगतान दिया जाता है। ग्रामीण अंचल के लोगों को शासकीय दर से मजदूरी मिलनी चाहिये। खेता की फसल प्रदूषण से नष्ट होती है, इसकी रोकथाम होनी चाहिये। उद्योग द्वारा दूषारोपण किया जाना चाहिये तथा स्कूल एवं हॉस्पिटल की व्यवस्था की जानी चाहिये।
- 5 श्री दीपक यादव, ग्राम जलसो ने कहा कि, उद्योग से पहली प्राथमिकता आस-पास के क्षेत्र के लोगों को मिलना चाहिये, फिर बाहरी लोगों को फायदा मिलना चाहिये, यह सभी बातें लिखित रूप से उद्योग द्वारा देनी चाहिये।
- 6 श्री देवेन्द्र वर्मा, ग्राम बरतोरी ने कहा कि, आज की लोक सुनवाई की जानकारी लोगों को नहीं है, मुनादी नहीं कराई गई है।
- 7 डॉ० कुंभ डहरिया, सरपंच ग्राम पंचायत बरतोरी ने कहा कि, आज की लोक सुनवाई निरस्त कर दी जाये, लोगों को जानकारी नहीं है। हमें मुनादी के लिये नहीं बोला गया था, अतः मुनादी नहीं की गई है, आस-पास के लोगों को जानकारी ही नहीं है, जिससे नकारात्मक बातें आ रही हैं, लोगों की जमीन भी प्रभावित हुई है, अतः आज की सुनवाई निरस्ता की जावे। अतः आज की मीटिंग को अगले समय के लिये रखा जावे, मैं आपत्ति करता हूँ।
- 8 श्री घर्मेन्द्र सिंह ठाकुर ने कहा कि, हमें लोक सुनवाई की सूचना नहीं मिली है।
- 9 श्री जितेन्द्र बंजारे, ग्राम नकटी ने कहा कि, लोक सुनवाई के संबंध में मुनादी करा दी जावे तथा लोक सुनवाई को अगले समय के लिये रखा जावे। लोगों को आज की लोक सुनवाई की जानकारी नहीं है।
- 10 श्री सुमेर सिंह ठाकुर, ग्राम बरतोरी ने कहा कि, लोक सुनवाई के संबंध में जानकारी नहीं है। ग्राम पंचायत का ताला 6 गाह से नहीं खुला है, लोक सुनवाई के संबंध में मुनादी नहीं हुई है, हमें जानकारी नहीं मिली है। सरपंच का दायित्व था, लोक सुनवाई के संबंध में बताने का।
- 11 श्री ओमप्रकाश ठाकुर, ग्राम बरतोरी ने कहा कि उद्योग तो लगना तय है, जमीन तो बची नहीं है, गांव के पक्ष में निर्णय लिया जावे।
- 12 श्री संतोष वर्मा, ग्राम बरतोरी ने कहा कि, जी.एम.आर. की रेल्वे लाईन के समीप किसानों के आने-जाने के लिये उद्योग की जमीन से 15 फीट का रास्ता छोड़ा जावे। गांव वालों का योग्यता-नुसार रोजगार में प्राथमिकता दी जावे।
- 13 श्री महेन्द्र सिंह ठाकुर, ग्राम बरतोरी ने कहा कि, हमारी जमीन निकली है, हम लोगों को पहले प्राथमिकता मिलनी चाहिये।
- 14 श्री जितेन्द्र बंजारे, ग्राम नकटी ने कहा कि, शासन के नियमानुसार निर्धारित मजदूरी का भुगतान किया जावे। श्रमिकों का शोषण नहीं होना चाहिये, यह सब उद्योगों को द्वारा लिखित रूप में दिया जावे।

- 15 श्री सोहन वर्मा, पूर्व सरपंच ग्राम बहंसर ने कहा कि, क्या यह लोक सुनवाई की सूचना मात्र ग्राम बरतौरी के लिये है ? लोक सुनवाई के संबंध में आरा-वास के लोगों को जागरूक नहीं है। उद्योगों द्वारा सीएसआर मद में कार्य नहीं किया जाता है, सीएसआर के लिये हड़ताल करना पड़ता है। प्लांट कितने में बन रहा है, कितने श्रमिक लगेंगे, सीएसआर में क्या कार्यवाही की जायेगी ? हमें लिखित में आश्वासन चाहिये कि सीएसआर का काम एवं रोजगार स्थानीय लोगों को मिलना चाहिये।

लोक सुनवाई के दौरान उठाये गये मुख्य मुद्दे/टीका-टीपणी आदि पर परियोजना प्रस्तावक द्वारा दिया गया उत्तर निम्नानुसार है :-

क्र.	टीका-टीपणी/सुझाव	परियोजना प्रस्तावक के उत्तर
i.	रोजगार हेतु अनुबंध।	परियोजना प्रस्तावक प्रस्तावित परियोजना में आसपास के ग्रामीणों को योग्यतानुसार एवं आवश्यकतानुसार रोजगार दिया जावेगा।
ii.	न्यूनतम वेतनमान।	परियोजना प्रस्तावक श्रमिकों के नियोजन में शासन द्वारा नियत न्यूनतम वेतनमान का पालन किया जायेगा।
iii.	प्रदूषण नियंत्रण।	परियोजना में आवश्यक एवं यथोचित वायु प्रदूषण नियंत्रण उपकरणों जैसे: स्पंज आयरन में इलेक्ट्रोस्टैटिक प्रेसिपिटेटर, इन्डक्शन फर्नेस में बैग फिल्टर युक्त डस्ट एक्सट्रैक्शन सिस्टम, एफ.बी.सी बॉयलर में इलेक्ट्रोस्टैटिक प्रेसिपिटेटर आदि का लगाया जाना प्रस्तावित है। जिससे कृषि उपज को नुकसान नहीं होगा।  प्रस्तावित संयंत्र में स्पंज आयरन, इन्डक्शन फर्नेस, रोलिंग मिल में क्लोज्ड कूलिंग सर्किट की स्थापना के कारण दूषित जल उत्सर्जन नहीं होगा। विद्युत उत्पादन संयंत्र से उत्पन्न निस्त्राव को उपचारित कर डस्ट साप्रेसन, एष कंडिजनिंग तथा सिंचाई में उपयोग किया जावेगा तथा परियोजना परिसर के बाहर दूषित जल का निस्तारण नहीं होगा। घरेलू दूषित जल उपचार हेतु सेप्टिक टैंक एवं सोकपिट प्रस्तावित है तथा सोक पिट के बाद दूषित जल शेष नहीं रहेगा। अतः परियोजना में सून्य निस्तारण संकल्प का परिपालन किया जायेगा।
iv.	फसलों का नुकसान।	परियोजना में आवश्यक एवं यथोचित वायु प्रदूषण नियंत्रण उपकरणों जैसे: स्पंज आयरन में इलेक्ट्रोस्टैटिक प्रेसिपिटेटर, इन्डक्शन फर्नेस में बैग फिल्टर युक्त डस्ट एक्सट्रैक्शन सिस्टम, एफ.बी.सी बॉयलर में इलेक्ट्रोस्टैटिक प्रेसिपिटेटर आदि का लगाया जाना प्रस्तावित है। जिससे कृषि उपज को नुकसान नहीं होगा।
v.	शिक्षा एवं स्वास्थ्य।	आसपास के गांवियों के लिए स्वास्थ्य एवं शिक्षा की व्यवस्था कॉर्पोरेट सोशियल रिस्पॉन्सिबिलिटी (सी.एस.आर.) के तहत की जायेगी।
vi.	15 फीट चौड़ा रास्ता।	परियोजना प्रस्तावक द्वारा सहमति व्यक्त की गई है कि वह साइडिंग से लगी हुई भूमि पर गांवियों के अत्यायन हेतु मार्ग उपलब्ध करायेगा।

अंत में अपर कलेक्टर गहोदय ने जन सुनवाई की कार्यवाही समाप्त घोषित की।

सब लोक सुनवाई का सत्र 11:40 बजे प्रारंभ होकर दोपहर लगभग 12:45 बजे  
संपन्न हुई। लोक सुनवाई के दौरान कुल 22 अभ्यापेदन प्राप्त हुये हैं, जो संलग्नक-1 अनुसार है।  
संपूर्ण लोक सुनवाई की विडियोग्राफी की गई।

(क्यू.ए. खिसी) 11/12/17  
अपर कलेक्टर, जिला अदालत (छ.ग.)  
शायपुर (छ.ग.)

## Minutes of Public Hearing

**Sub. :** Details of PUBLIC HEARING held on dated 27<sup>th</sup> November, 2017 as per E.I.A Notification dated - 14.09.2006 for Pollution Clearance of the proposed Sponge Iron Plant capacity - 1,20,000 TPA, Induction Furnace with CCM & LRF of 1,35,000 TPA, Rolling Mill of capacity 90,000 TPA, Power Plant through WHRB of 8 MW & Power Plant through FBC Boiler of 8 MW, proposed by M/s Vikas Metaliks & Energy Ltd. at Vill - Bartori, Tehsil - Tilda, Dist - Raipur - reg.

M/s Vikas Metaliks & Energy Ltd. have applied to the C.G. Environment Conservation Board, Raipur for a Public Hearing to issue of NOC or Pollution Clearance for their proposed Industrial Unit to be established at Vill - Bartori, Tehsil - Tilda, Dist - Raipur for set-up of Sponge Iron Plant of 1,20,000 TPA, Induction Furnace Plant with CCM & LRF of 1,35,000 TPA, Rolling Mill of 90,000 TPA, Power Plant through WHRB of 8 MW & Power Plant through FBC Boiler of 8 MW. Accordingly, notice of public hearing has been published in Dainik Bhaskar and Hindustan Times News Paper that public hearing will be conducted on 27.11.2017( Monday) at 11:30 AM at the premises of the proposed Unit at Vill. - Bartori, Tehsil - Tilda, Dist - Raipur P.H.No- 149/16,20,21,25 and others. The information regarding this Public Hearing has also forwarded to the Gram Panchayat of Bartori.

To obtain Pollution Clearance for the proposed Plant, the Public Hearing has been completed headed by Shri Q.A.Khan, Upper Collector Raipur. During the Public Hearing, Shri Prakash Rabde; Scientist of Regional Office of the C.G. Environment Conservation Board, Raipur and the Representative of the Company Mr. Umesh Sharma as well as approx. 100 local people were present in the Public Hearing.

Following are the details of Public Hearing. :-

1. Public Hearing started at 11:40 AM.
2. At first, the process of registering presence of the present people has started. A list of those who signed the Register is enclosed hereto as "Annexure - II".
3. Shri Prakash Rabde; the Scientist of Regional Office C.G. Environment Conservation Board Raipur has requested the Upper Collector to start the Public Hearing by briefing the details regarding the proposed Plant / Project.
4. Upper Collector then announced to start the Public Hearing and instructed the Project proponent to give detail information regarding the Project.



- 2 JAN 2018

5. Shri Sudhir Singh; the Senior Manager of M/s Pioneer Enviro Laboratories & Consultancy Pvt . Ltd Hyderabad has explain the complete details of the Project as the Project Proponent. He explained that M/s Vikas Metaliks & Energy Ltd has proposed to set - up an integrated Steel Manufacturing Plant comprising Sponge Iron Plant of 1,20,000 TPA, Induction furnace with CCM & LRF of 1,35,000 TPA, Rolling Mill of 90,000 TPA, Power Plant through WHRB of 8 MW & Power Plant through FBC Boiler of 8 MW capacity at Vill - Bartori, Tehsil-Tilda, Dist - Raipur on a developed plots of land measuring area of 34.26 acres owned by the Company. The Company has also applied to the Central Environment and Forest Ministry for Pollution Clearance according to the present pollution rules and with this context, this Public Hearing is being conducted. The Project Proponent informed that the proposed Unit will install Electrostatic Precipitators in Sponge Iron Kilns, Bag Filter in Induction furnace and Electrostatic Precipitator in FBC based power Plant for Air pollution as well Water will be sprinkled for control of dust emission.

The total Water requirement covering Plant & domestic requirements would be about 450cub/M Per day which will be fulfilled from ground water source. The company has already applied to the Central Ground Water Board for permission to this effect. It is also proposed to completely recycled the waste Water in process to reduce the requirement of Water and to install an air-cooled condenser in Power Plant. Since the effluent / waste Water will completely be recycled in further process as such there will be no any negative impact on the surroundings atmosphere. It is also proposed that approx 11.3 acre land will be reserved for green belt on a 10 Mts. width circle area and plantation will be done on it to help the pollution conservation. He Futher said that employment for the locals would be provided as per their qualification and capabilities. And also to fulfill the social liabilities as necessary following the norms. At the end of his explanation, he said that all the rules & Norms of pollution will be implemented in the project and will also follow all the suggestions given by the C.G. Environment conservation board Raipur

6. Shri Prakash Rabde; the Scientist of Regional Office C.G. Environment conservation board Raipur requested all the people present during the Public Hearing to give their suggestions or to raise objections in written or oral and assured that the video recording of public hearing is also going on.

Thereafter, the followings suggestions/objections are given by the people present during the Public Hearing :

1. Shri Dr. Kumbh Dahariya, Sarpanch, Village: Bartori raised the issue of damage of Crop. He said that 90% of crop is being damaged in the Siltara area. He raised the issue of employment, he said that local people should given priority in employment.

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- 2 JAN 2018

He Further said that a agreement should be made with the company that he will control the pollution .

2. Shri Om Prakash Thakur Vill - Bartori has pointed out that an agreement should be made for employment and for proper measure should be taken to control the pollution and Plantation should been done .
3. Shri Lakhaan Chauhan Vill- Behsar has said that the water pollution be controlled and the proper measures should be taken for this.
4. Shri Saheb Das Manikpuri of Vill - Behsar said that minimum wages as per the Govt. rules should be given, arrangement for prevention of crop damage & Air Pollution should be done. He also said that a school & hospital should be open in the village.
5. Shri Deepak Yadav of Vill - Jalso has raised the issue of employment, he said the local people should be given prioprity in employment.
6. Shri Devendra Verma of Vill - Bartori said that no proper information given for public hearing.
7. Shri Dr. Kumbh Dahariya, Sarpanch, Village: Bartori said that today public hearing should be adjourned as no proper information has been given to people for public heraring,
8. Shri Dharmedra singh Thakur of Vill- Bartori also said that there is no information about public hearing.
9. Shri Jitendra Banjare of Vill - Nakti also said that there is no information about Public hearing as such it should be adjourned.
10. Shri Sumer Singh Thakur of Vill - Bartori also said that no information has been given for public hearing , he added that it was the responsibility of Sarpanch to inform the village people about today's public hearing .
11. Shri Om Prakash Thakur of Vill - Bartori said that it is sure that the Industry will set-up, decision should be in favor of the village.

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- 2 JAN 2018

12. Shri Santosh Verma of Vill – Bartori advised that 15 feet wide road should be provided closed to Rly. Lines in the industrial land of the Company for the villager's and Local people should given priority in employments .
13. Shri Mahendra Singh Thakur of Vill – Bartori said that Priority will be given to the land sellers in employment.
14. Shri Jitendra Banjare Vill- Nakti said the minimum wages should be given to the workers as fixed by the Govt. and these should be given in written by the company .
15. Shri Sohan Verma, ex-Sarpanch of Vill -Behsar said that is there the information for public hearing is only for Bartori village because the people of surroundings have no any information of public hearing. Futher he said that the details of the Project Cost and works to be done by the company under CSR Head should be disclosed, he also said that a written assurance should be given that prioprity will be given to local people in employments and in CSR works.

**The followings compliances given by the Project proponent on the Issues raised by the people during Public hearing :-**

Sr. No.	Issues raised		Project Proponent Reply
i.	Agreement for employment	=	Agreed, priority will be given to local people as per their qualification and capabilities.
ii.	Minimum wages	=	Project Proponent has assured that rate of wages will be as per Government norms.
iii.	Pollution control measures	=	The Project Proponent informed that it is proposed to install all the necessary Air Pollution Control devices as Electrostatic Precipitators in Sponge Iron Kilns, Bag Filter in Induction furnace and Electrostatic Precipitator in FBC based Power Plant. Water will be sprinkled for control of dust emanation. Closed cooling circuit will be implemented in Sponge Iron kilns, Induction furnaces and Rolling Mill, hence there will not be any effluent generation. However effluent from power plant will be treated in neutralcation cum settling tanks and treated effluent will be reuse for horticulture purpose, dust suppression and ash conditioning within proposed

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- 2 JAN 2018

			premises only and no effluent will be letout the premises and ZERO discharge condition will be implemented.  <i>Contd. ...</i>
iv.	Crop damage	=	Regarding this, the Project Proponent informed that it is proposed to install Electrostatic Precipitators Sponge Iron Kilns, Bag Filter in Induction furnace and Electrostatic Precipitator in FBC based power Plant. Water will be sprinkled for control of dust emanation. Hence after implementation of these measures there will not be any possibility of crop damage.
v.	Health and education	=	Education and health facilities to villagers will be provided under CSR.
vi.	15 feet wide road will be provided to villagers for their movements.	=	Agreed, Project proponent has informed that Company will provide 15 feet wide road closed to Rly. Lines for local villagers.

And at last, the Upper Collector declared the completion of the proceedings of the Public Hearing.

This Public hearing is started at 11:40 AM and completed at about 12:45 PM. During the Public Hearing, 22 written letter has been received which are enclosed as "Annexure - I". Video - Recording has been done of complete Public Hearing.

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*Amey*

Identifying Witness



ATTESTED!  
*B.S. Chawla*  
B. S. CHAWLA  
NOTARY / ADVOCATE  
RAIPUR. (C.G.)

- 2 JAN 2018



ISO 9001 : 2000 COMPANY



## **VIKAS METALIKS & ENERGY LTD.**

F-4, 1st Floor, Modern Complex,  
Motibagh Chowk, Raipur - 492 001 (C.G.)  
Ph : (0771) 2236690, 3294290, Fax : 2236690,  
E-mail : vspower@rediffmail.com

CIN:-U27102CT2004PLC017119

### **CORPORATE ENVIRONMENTAL POLICY**

The "VIKAS METALIKS & ENERGY LIMITED" is committed for its contribution to the upliftment of the Society, is forever committed to protect and save the Environment, keeping in mind the Sustainable Development.

Resolution: VIKAS METALIKS & ENERGY LIMITED on 5<sup>th</sup> day of April, 2018, the Management has taken a decision on Environment Policy, that it is committed to operate the Steel Plant at Village Bartori, Tehsil Tilda, District Raipur, Chhattisgarh with the following objectives.

The top management of the company pledges to ensure

- A clean/ green and safe Environment in and around its places of operation by providing all pollution control measures at all stages of its projects and operations
- Compliance with not only all the regulatory and statutory requirements but also going beyond the prescribed norms, adopting more stringent international standards
- Adoption of International Environmental Management Systems, Cleaner and latest Technologies to protect the Environment
- Organizational Structure and processes to guide, plan and implement all Environmental related activities and conservation measures for fuels, water and energy
- Sufficient resources of funds, human and technology apart from infrastructure facilities
- Training to all employees including contract workmen and nearby society to provide input on Environmental Upgradation Techniques and inculcate a culture of self regulation and ownership
- Monitoring and Reporting of Environmental performances / non-compliances / deviations for Review and Guidance by top management
- Recognition and Reward schemes to motivate employees
- Sharing of Environmental Performance with all Stake holders through Annual Report / Press Releases / Media
- Communication of the policy to all employees including contract workmen for implementation

### **Corporate Social Responsibility Policy**

As a Corporate Organization we believe that it is our primary purpose to give back to society. Giving and sharing what we have received is embedded deeply in us. We will actively pursue to raise the quality of life of the people around us. We hold hands in our joint effort to create better tomorrows.



ISO 9001 : 2000 COMPANY



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F-4, 1st Floor, Modern Complex,  
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Ph : (0771) 2236690, 3294290, Fax : 2236690,  
E-mail : vspower@rediffmail.com  
CIN:-U27102CT2004PLC017119

### Occupational Health & Safety Policy

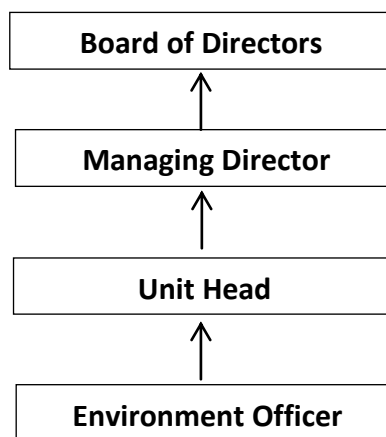
We follow the occupational health and safety policy as below

- Create an environment which is safe and secure for everyone in its vicinity, be it a worker, contractor, visitor and even the local community. All identifiable risks and hazards are treated with the gravest concern.
- To constantly endeavour towards the highest level of health and safety such that injuries, waste and emissions are reduced to the bare minimum.
- Train all employees to work safely and responsibly thus preventing injury to themselves and others.
- Ensure that optimum conditions exist for the proper execution of all the stipulated health and safety norms.

### Hierarchy to implement Environment Policy

An Environmental Officer will be appointed to look after all environmental issues and ensure compliance with Environmental Clearance conditions / CECB norms and will report to Unit Head who ultimately will report to Managing Director. Subsequently it will be discussed in the Board meeting and it will be made aware of the Environmental Policy and compliance on Environmental Clearance / CECB norms to all. Any non-compliance / deviations will be brought to the notice of the Managing Director and subsequently to Board of Directors. Necessary fund allocation for closure of NCs will be approved in the Board of Directors meeting and accordingly corrective measures will be taken up on priority basis.

The following will be the organisation chart pertaining to Environment Policy.



Place : Raipur

Date : 05.04.2018

  
(UMESH SHARMA)  
Managing Director



Government of India  
Central Ground Water Authority (CGWA)  
Ministry of Water Resources, River Development and Ganga Rejuvenation

**Application for Issue of NOC to Abstract Ground Water (NOCAP)**

Welcome : kpanigrahi56

Previous Login Date Time: 27/03/2018 17:42:54 PM , IP Address: 124.123.62.54

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**Track Status**

[Application Status](#)

- [▶ Online](#)

**Location**

[Area Type](#)

[Regional office](#)

[Location](#)

[CGWA](#)

[Headquarters](#)

**Contact Us**

[Contact](#)

**Industrial**

**New- Save As Draft (Number of Save as Draft Application Allowed at a time : 3)**

**(Validity of Save as Draft Application : 2 Month(s))**

Sr. No.	Name of Industry	Created Date
There is No Save As Draft Application.		

**Renew- Save As Draft**

Sr. No.	Name of Industry	Application Number	Existing NOC	Renewal	Created Date
There is No Save As Draft Application.					

**Submitted : (Count : 1)**

Sr. No.	Name of Industry	Application Number	Status		Digital Signed Letter	Scan Letter	NOC- Number	Apply Type	Renewal
1	M/S VIKASH METALIKS AND ENERGY LIMITED	21-4561 ICT/IND/2017	Approved	Print			CGWA/NOC/IND/ORIG/2018/3370	Online	

1 of 1

3/28/2018, 5:25 PM



Government of India  
Central Ground Water Authority (CGWA)  
Ministry of Water Resources, River Development and Ganga Rejuvenation



**Application for Issue of NOC to Abstract Ground Water (NOCAP)**

Welcome : kpanigrahi56

Previous Login Date Time: 27/03/2018 17:42:54 PM , IP Address: 124.123.62.54

[Logout](#)

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<p><b>Information</b></p> <p><a href="#">Guidelines</a> <a href="#">Steps for Filling</a> <a href="#">Online Application</a></p> <p><b>Documents Required</b></p> <p><a href="#">Documents Required for Online Application</a></p> <ul style="list-style-type: none"> <li><a href="#">▶ Industrial</a></li> <li><a href="#">▶ Infrastructure</a></li> <li><a href="#">▶ Mining</a></li> </ul> <p><b>Track Status</b></p> <p><a href="#">Application Status</a></p> <ul style="list-style-type: none"> <li><a href="#">▶ Online</a></li> </ul> <p><b>Location</b></p> <p><a href="#">Area Type</a> <a href="#">Regional office</a> <a href="#">Location</a> <a href="#">CGWA</a> <a href="#">Headquarters</a></p> <p><b>Contact Us</b></p> <p><a href="#">Contact</a></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="8" style="text-align: center;"><b>Application Status</b></td> </tr> <tr> <td style="width: 20%;"><b>Application No :</b></td> <td colspan="7">21-4/561/CT/IND/2017</td> </tr> <tr> <td><b>Receive Date :</b></td> <td colspan="7">20/03/2018</td> </tr> <tr> <td><b>Name of Industry :</b></td> <td colspan="7">M/S VIKASH METALIKS AND ENERGY LIMITED</td> </tr> <tr> <td><b>Application Processing Fee :</b></td> <td colspan="7">Rs. 1000.00/- (Rupees One Thousand Only) <b>(Submitted: Yes)</b></td> </tr> <tr> <td><b>Final Status</b></td> <td colspan="7">Approved</td> </tr> </table> <table border="1" style="width: 100%; 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	Ground Water Board North Central Chhattisgarh	Ground Water Board North Central Chhattisgarh	Ground Water Authority			action pl.		
22/01/2018	<b>(Regional Director)</b> Central Ground Water Board North Central Chhattisgarh	<b>(Evaluation Officer)</b> Central Ground Water Authority	<b>(Member Secretary)</b> Central Ground Water Authority	13/03/2018	Forward	Forwarded for approval	450.00	164250.00
13/03/2018	<b>(Evaluation Officer)</b> Central Ground Water Authority	<b>(Member Secretary)</b> Central Ground Water Authority	<b>(Chairman)</b> Central Ground Water Authority	16/03/2018	Forward	Forwarded for approval	450.00	164250.00
16/03/2018	<b>(Member Secretary)</b> Central Ground Water Authority	<b>(Chairman)</b> Central Ground Water Authority	<b>(Evaluation Officer)</b> Central Ground Water Authority	19/03/2018	Approved	NOC approved	450.00	164250.00

**NOC Processing**

Receive Date	From User Name	To User Name	Forwarded User Name	Action Date	Action Internal Status	Action Comment
19/03/2018	<b>(Chairman)</b> Central Ground Water Authority	<b>(Evaluation Officer)</b> Central Ground Water Authority	<b>(Approval Officer)</b> Central Ground Water Authority	19/03/2018	Forward	Draft NOC generated.
19/03/2018	<b>(Evaluation Officer)</b> Central Ground Water Authority	<b>(Approval Officer)</b> Central Ground Water Authority	<b>(Member Secretary)</b> Central Ground Water Authority	20/03/2018	Forward	Draft NOC is in order.
20/03/2018	<b>(Approval Officer)</b> Central Ground Water Authority	<b>(Member Secretary)</b> Central Ground Water Authority	<b>(Member Secretary)</b> Central Ground Water Authority	20/03/2018	Approved	Draft NOC approved.

**NOC Disbursement**

Receive Date	From User Name	To User Name	Forwarded User Name	Action Date	Action Internal Status	Action Comment
20/03/2018	<b>(Member Secretary)</b> Central Ground Water Authority	<b>(Member Secretary)</b> Central Ground Water Authority		20/03/2018	Approved	NOC approved.

[Go Back](#)